

1 **Chapter 3: TRAIL CLASSIFICATION SYSTEM**

2 The Division of Parks and Outdoor Recreation through the Trail Management Policy has
3 adopted a new Trail Classification System. The Trail Classification System is a close
4 adaptation of the National Trail Classification System that has been formally adopted by
5 most federal land management agencies. Using this system is an important step towards
6 enhancing partnerships with organizations and agencies that border the park and developing
7 resource efficiencies with the use of consistent trail management terminology and standards.
8 The Trail Classification System is similar to systems used in the past in that the scale of trail
9 development is defined by a particular trail class that identifies applicable design parameters
10 and provides management intent for what maintenance standards apply. This new system
11 differs in that the design parameters for a particular class are further refined by the trail type
12 and designed use of the trail. The new system allows for more thorough assessments of trail
13 conditions, an expanded means to record and communicate intended design and management
14 guidelines, and better planning for trail management and maintenance. Below is a brief
15 description of how the Trail Classification System is organized and functions.

16 **Trail Type**

17 There are three types of trail types and all are used in this plan:

- 18 1. Terra Trail
- 19 2. Snow Trail
- 20 3. Water Trail

21 Since only one trail type may be used for each trail or trail segment, you may see multiple
22 entries for the same physical location of a trail. For example: trail “X” may have
23 specifications for terra type and different specifications for snow type. The trail is in the
24 same physical location but is described differently for seasonal purposes.
25

26 **Trail Class**

27 Five trail classes ranging from least developed (Class 1) to highly developed (Class 5) will
28 uniformly apply to all trail types however some trail classes may not be applicable to a trail
29 type (such as Class 5 water trail). The actively managed uses, user preferences, setting,
30 protection of sensitive resources and other management activities were taken into account to
31 determine which trail class to apply. Trail classes describe the typical attributes but
32 exceptions may occur. The trail class that most closely matches the managed objective for a
33 trail is applied. Only one trail class may be applied to a trail or trail segment. See figures 3.1
34 for the general trail class criteria and figure 3.2 for photo examples of each trail class.
35
36

Figure 3.1: General Trail Criteria

General Trail Criteria					
Trail Attributes	Trail Class 1 Minimal/ Undeveloped	Trail Class 2 Simple/Minor Development	Trail Class 3 Developed/Improved	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Tread & Traffic Flow	-Tread intermittent & often indistinct -May require route finding -Native materials only	-Tread discernible & continuous, but narrow and rough -Few or no allowances constructed for passing -Native materials	-Tread obvious & continuous -Width accommodates unhindered one-lane travel, occasional allowances constructed for passing -Typically native materials	-Tread wide & relatively smooth with few irregularities -Width may consistently accommodate two-lane travel -Native or imported materials -May be hardened	-Width generally accommodates two-lane and two-directional travel, or provides frequent passing turnarounds -Commonly hardened with asphalt or other imported material
Obstacles	-Obstacles common -Narrow passages; brush, steep grades, rocks and logs present	-Obstacles occasionally present -Blockages cleared to define route and protect resources -Vegetation may encroach into trailway	-Obstacles infrequent -Vegetation cleared outside of trailway	-Few or no obstacles exist -Grades typically <12% -Vegetation cleared outside of trailway	-No obstacles -Grades typically <8%
Constructed Features & Trail Elements	-Minimal to non-existent -Drainage is functional -No constructed bridges or foot crossings	-Structures are of limited size, scale and number -Drainage is functional -Structures adequate to protect trail infrastructure and resources -Primitive foot crossings and fords	-Trail structures (walls, steps, drainage, raised trail) may be common & substantial -Trail bridges as needed for resources protection and appropriate access -Generally native materials	-Structures frequent and substantial -Substantial trail bridges are appropriate at water crossings -Trailside amenities may be present	-Structures frequent or continuous; may include curbs, handrails, trailside amenities and boardwalks -Drainage structures frequent; may include culverts and road-like designs
Signs	-Minimum required -Generally limited to regulation and resource protection -No destination signs present	-Minimum required for basic direction -Generally limited to regulation and resource protection -Typically very few or no destination signs present	-Regulation, resource protection, user reassurance -Directional signs at junctions, or when confusion is likely -Informational and interpretative signs may be present	-Wide variety of signs likely and present -Informational signs likely -Interpretive signs possible	Wide variety of signage is present -Information and interpretive signs likely

General Trail Criteria					
Trail Attributes	Trail Class 1 Minimal/ Undeveloped	Trail Class 2 Simple/Minor Development	Trail Class 3 Developed/Improved	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Typical Recreation Environments & Experience	-Natural, unmodified -Primitive setting	-Natural, essentially unmodified -Primitive to Semi-primitive	-Natural, primarily unmodified -Semi-primitive to roaded natural setting -Transition	-May be modified -Typically roaded natural to rural setting -Transition, rarely present in wilderness	-Can be highly modified -Typically rural to urban setting -Commonly associated with visitor centers or high-use recreation sites -Not present in wilderness
Trail Management Typically managed to accommodate:	-Low level use -Highly skilled users, comfortable off trail -Users with high degree of orienteering skill -Some travel modes & ability levels may be impractical or impossible -Water trail users require high level of navigation/orientation and paddling skills	-Low-to-moderate use levels -Mid-to-highly skilled users, capable of traveling over awkward conditions/obstacles -Users with moderate orienteering skill -Trail Suitable for many user types but challenging and involves advanced skills -Water trails: moderate to high level of navigation/orientation and paddling/piloting skills required	-Moderate to heavy use -Users with intermediate skill level and experience -Users with minimal orienteering skills -Moderately easy travel by managed use types -Random potential for accessible use -Water trails: Basic to moderate navigation and paddling/piloting skills required	-Very heavy use -Users with minimal skills and experience -Users with minimal to no orienteering skills -Easy/ comfortable travel by managed use types -Maybe or has the potential to be made accessible -Water trails: Basic navigation and paddling/piloting skills required	-Intensive use -Users with limited trail skills and experience -Trail typically meets agency requirements for accessibility

General Trail Criteria					
Trail Attributes	Trail Class 1 Minimal/ Undeveloped	Trail Class 2 Simple/Minor Development	Trail Class 3 Developed/Improved	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Maintenance Indicators & Intensity	-Resource protection or safety commensurate with targeted recreational experience -Infrequent or no scheduled maintenance, usually in response to reports of unusual resource problems requiring repair	-Resource protection or safety commensurate with targeted recreational experience -Maintenance scheduled to preserve trail facility & route location or in response to reports of unusual resource problems	-User convenience -Resource protection or safety commensurate with targeted recreational experience -Trail cleared to make available for use early in use season and to preserve trail integrity -Maintenance typically in response to trail or resource damage or significant obstacles to managed use type and experience level	-User comfort and ease -Resource protection or safety commensurate with targeted recreational experience -Trail cleared to make available for use at earliest opportunity in use season -Maintenance typically performed at least annually	-User comfort and ease -Targeted high level of accessibility to key recreational opportunities -Safety commensurate with targeted recreational experience -Maintenance performed at least annually or as needed to meet posted conditions, major damage or safety concerns typically corrected or posted within 24 hours of notice
Additional Criteria	-Typically not managed for Pack and Saddle and Motorized Trails				-Not managed for Pack and Saddle stock, Watercraft or Motorized use.

Figure 3.2: Trail Class Photo Examples

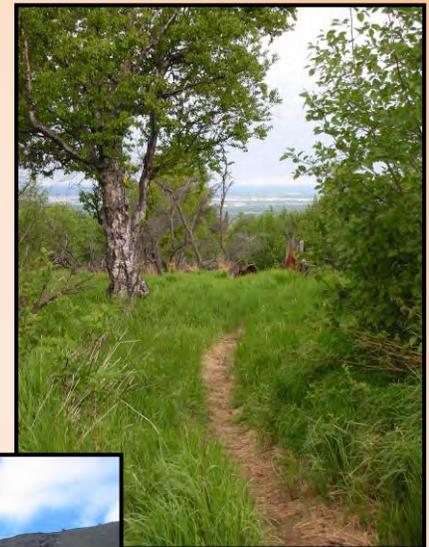
Trail Class 1

- Low level use
- Highly skilled users, comfortable off trail with high degree of orienteering skill
- Some travel modes may be impractical or impossible



Trail Class 2

- Low or moderate use levels
- Mid-to-highly skilled users, capable of traveling over awkward conditions/obstacles
- Trail suitable for many types but challenging, involving advanced skills



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Trail Class 3

- Moderate to heavy use
- Users with intermediate skill level and trail experience
- Moderately easy travel by managed use types



Trail Class 5

- Intensive use
- Users with limited skills and trail experience
- Trail typically meets agency requirements for accessibility



Trail Class 4

- Very heavy use
- Users with minimal skills and trail experience
- Easy/comfortable travel by managed use types



Managed Use

Managed Use is a term that is used to describe the modes of travel that are actively managed and appropriate on a trail considering the design of the trail. There can be many managed uses per trail or trail segment. Managed Use is applied to indicate a management decision or intent to accommodate or encourage a specific type of use but it does not necessarily mean that other uses are prohibited.

Designed Use

Designed Use is the intended use that controls the desired design of the trail and determines the subsequent maintenance parameters for a trail. There can only be one Designed Use per trail or trail segment. Eight different designed uses are applied in this plan. They are:

1. Hiker/Pedestrian
2. Bicycle
3. Pack and Saddle
4. All-Terrain Vehicle
5. Snowmobile
6. Cross Country Ski (Classical/Diagonal)
7. Nordic Ski (Skate)
8. Non-motorized Watercraft

Design Parameters

Design parameters provide guidance for the assessment, survey, design, construction, repair and maintenance of trails. While the five trail classes apply, the specific design parameters vary under each trail class depending on the designed use. Site-specific circumstances may demand some exceptions or variances to the Design Parameters based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable trail class. Trail design parameters are provided in figures 3.3 – 3.10 for the designed uses used in this plan.

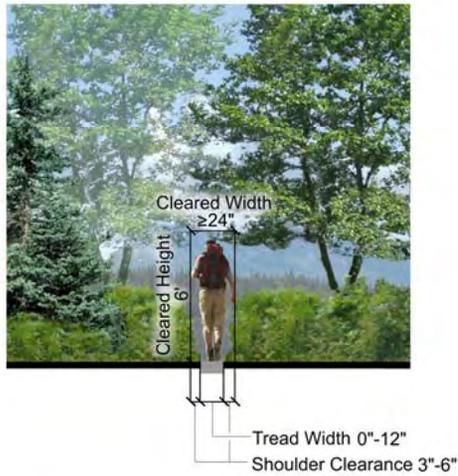
Trail Management Objectives

Trail Management Objectives (TMOs) are the mechanisms that link the Trail Classification System and direction given in this plan to on-the-ground trail management. TMOs synthesize and document in one form the management intention for the trail while providing basic reference information for any subsequent trail planning, management, condition surveys, and reporting. A TMO is required for each trail or trail segment as a pre-requisite for completing trail condition assessment surveys and subsequent prescriptions for work needed to meet standard. Each TMO is approved by management staff to ensure that the objectives for the trail are consistent with this plan and anticipated future land management actions. After approval, the TMOs provide the mechanism for trail maintenance staff and volunteers to know how to maintain and bring a particular trail or trail segment up to standard as needed. A sample TMO is provided in Appendix A.

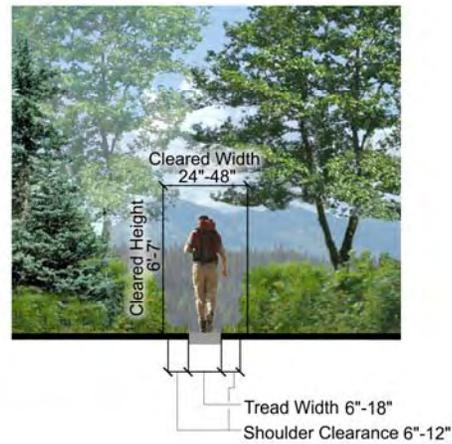
Figure 3.3: Hiker/Pedestrian Design Parameters

Designed Use HIKER/PEDESTRIAN		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	0" – 12"	6" – 18"	18" – 36"	24" – 60"	36" – 72"
	Double Lane	36"	36"	36" – 60"	48" – 72"	72" – 120"
	Structures (Minimum Width)	18"	18"	18"	36"	36"
Design Surface	Type	Native, ungraded May be continuously rough	Native, limited grading May be continuously rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native with improved sections of borrow or imported material, and routine grading Minor roughness	Likely imported material, and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	No protrusions
	Obstacles (Maximum Height)	24"	14"	10"	8"	No obstacles
Design Grade	Target Grade	5% – 25%	5% – 18%	3% – 12%	2% – 10%	2% – 5%
	Short Pitch Maximum	40%	35%	25%	15%	5% – 12%
	Maximum Pitch Density	20% – 40% of trail	20% – 30% of trail	10% – 20% of trail	5% – 20% of trail	0% – 5% of trail
Design Cross Slope	Target Cross Slope	Natural side slope	5% – 20%	5% – 10%	3% – 7%	2% – 3% (or crowned)
	Maximum Cross Slope	Natural side slope	25%	15%	10%	3%
Design Clearing	Height	6'	6' – 7'	7' – 8'	8' – 10'	8' – 10'
	Width	≥ 24" Some vegetation may encroach into clearing area	24" – 48" Some light vegetation may encroach into clearing area	36" – 60"	48" – 72"	60" – 72"
	Shoulder Clearance	3" – 6"	6" – 12"	12" – 18"	12" – 18"	12" – 24"
Design Turn	Radius	No minimum	2' – 3'	3' – 6'	4' – 8'	6' – 8'

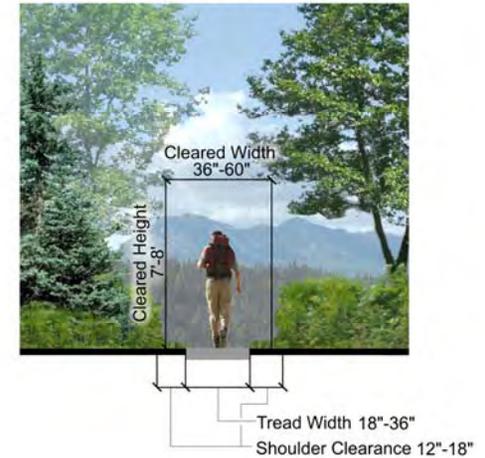
Class 1



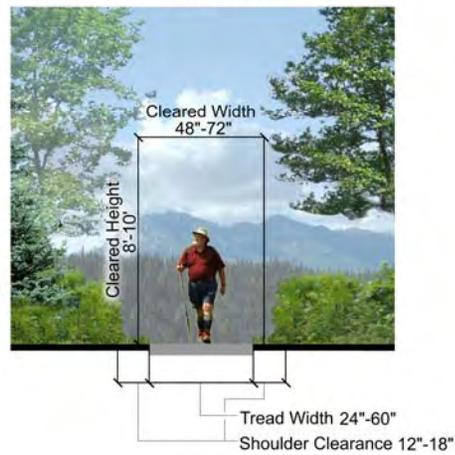
Class 2



Class 3



Class 4



Class 5

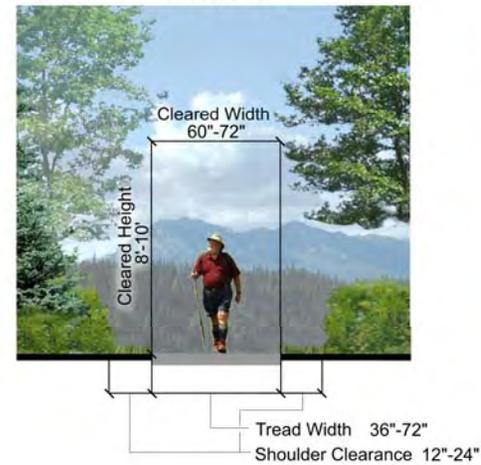
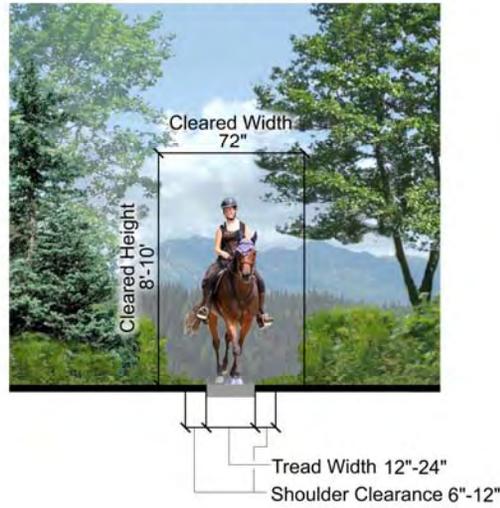


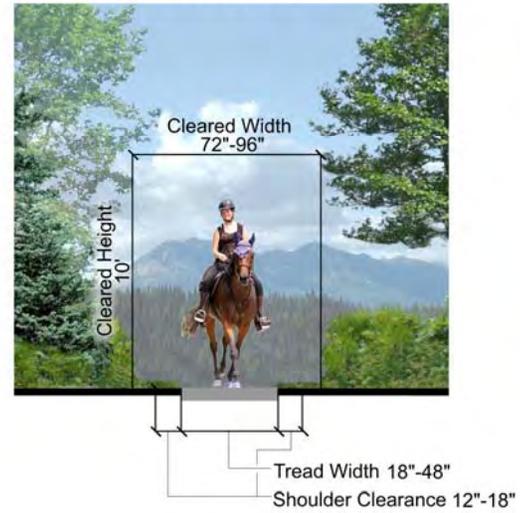
Figure 3.4: Pack and Saddle Design Parameters

Designed Use PACK AND SADDLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	Typically not designed or actively managed for equestrians, although use may be allowed	12" – 24" May be up to 48" along steep side slopes 48" – 60" or greater along precipices	18" – 48" 48" – 60" or greater along precipices	24" – 96" 48" – 60" or greater along precipices	Typically not designed or actively managed for equestrians, although use may be allowed
	Double Lane Structures (Minimum Width)		60" Other than bridges: 36" Bridges without handrails: 60" Bridges with handrails: 84" clear width	60" – 84" Other than bridges: 36" Bridges without handrails: 60" Bridges with handrails: 84" clear width	84" – 120" Other than bridges: 36" Bridges without handrails: 60" Bridges with handrails: 84" clear width	
Design Surface	Type		Native, with limited grading May be frequently rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native, with improved sections of borrow or imported material and routine grading Minor roughness	
	Protrusions		≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	
	Obstacles (Maximum Height)		12"	6"	3"	
Design Grade	Target Grade		5% – 20%	3% – 12%	2% – 10%	
	Short Pitch Maximum		30%	20%	15%	
	Maximum Pitch Density		15% – 20% of trail	5% – 15% of trail	5% – 10% of trail	
Design Clearing	Height		8' – 10'	10'	10' – 12'	
	Width		72" Some light vegetation may encroach into clearing area	72" – 96"	96"	
	Shoulder Clearance	6" – 12" Pack clearance: 36" x 36"	12" – 18" Pack clearance: 36" x 36"	12" – 18" Pack clearance: 36" x 36"		
Design Turn	Radius	4' – 5'	5' – 8'	6' – 10'		

Class 2



Class 3



Class 4

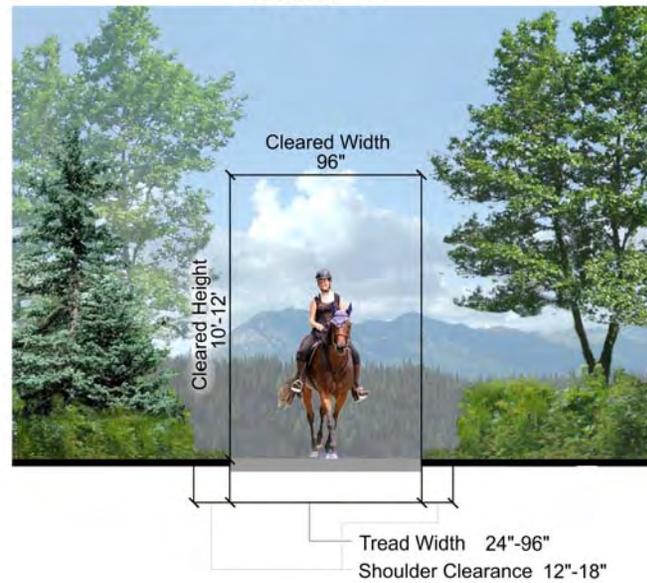
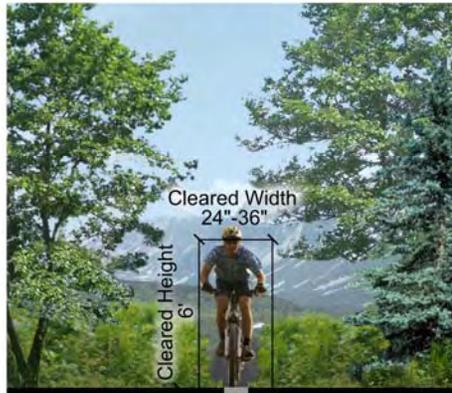


Figure 3.5: Bicycle Design Parameters

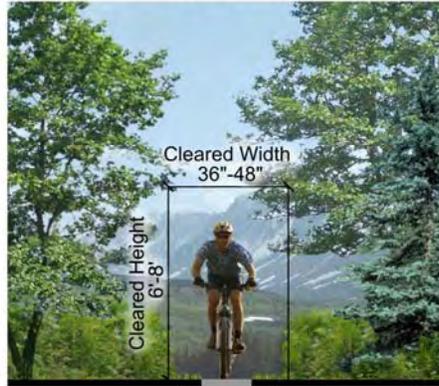
Designed Use BICYCLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	6" – 12"	12" – 24"	18" – 36"	24" – 48"	36" – 60"
	Double Lane	36" – 48"	36" – 48"	36" – 48"	48" – 84"	72" – 120"
	Structures (Minimum Width)	18"	18"	36"	48"	60"
Design Surface	Type	Native, ungraded May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native, with limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present, but not common	Native, with improved sections of borrow or imported materials and routine grading Stable, with minor roughness	Likely imported material and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, but not continuous	≤ 3" Uncommon and not continuous	No protrusions
	Obstacles (Maximum Height)	24" No obstacles	12" No obstacles	10" No obstacles	8" No obstacles	No obstacles
Design Grade	Target Grade	5% – 20%	5% – 12%	3% – 10%	2% – 8%	2% – 5%
	Short Pitch Maximum	30% 50% on downhill segments only	25% 35% on downhill segments only	15%	10%	8%
	Maximum Pitch Density	20% – 30% of trail	10% – 30% of trail	10% – 20% of trail	5% – 10% of trail	0% – 5% of trail
Design Cross Slope	Target Cross Slope	5% – 10%	5% – 8%	3% – 8%	3% – 5%	2% – 3%
	Maximum Cross Slope	10%	10%	8%	5%	5%
Design Clearing	Height	6'	6' – 8'	8'	8' - 9'	8' - 9'
	Width	24" – 36" Some vegetation may encroach into clearing area	36" – 48" Some light vegetation may encroach into clearing area	60" – 72"	72" – 96"	72" – 96"
	Shoulder Clearance	0" – 12"	6" – 12"	6" – 12"	6" – 18"	12" – 18"
Design Turn	Radius	2' – 3'	3' – 6'	4' – 8'	8' – 10'	8' - 12'

Class 1



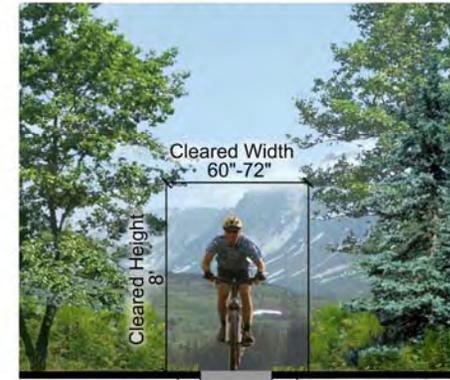
Tread Width 6"-12"
Shoulder Clearance 0"-12"

Class 2



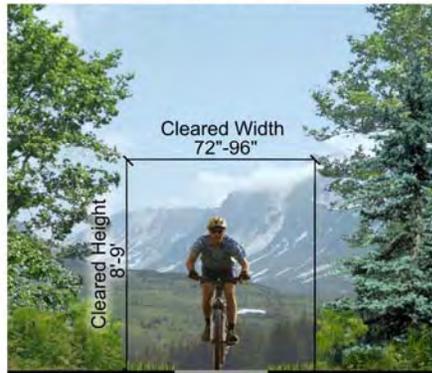
Tread Width 12"-24"
Shoulder Clearance 6"-12"

Class 3



Tread Width 18"-36"
Shoulder Clearance 6"-12"

Class 4



Tread Width 24"-48"
Shoulder Clearance 6"-18"

Class 5

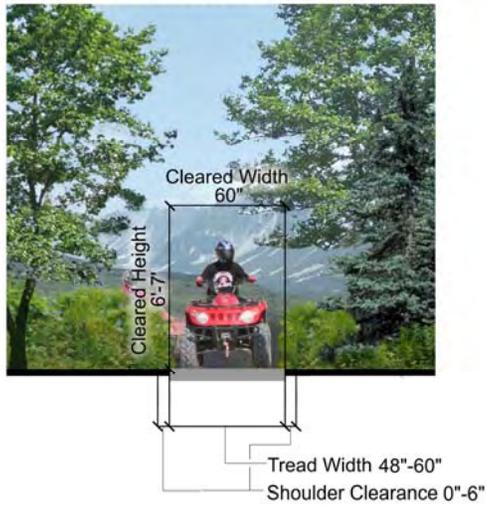


Tread Width 36"-60"
Shoulder Clearance 12"-18"

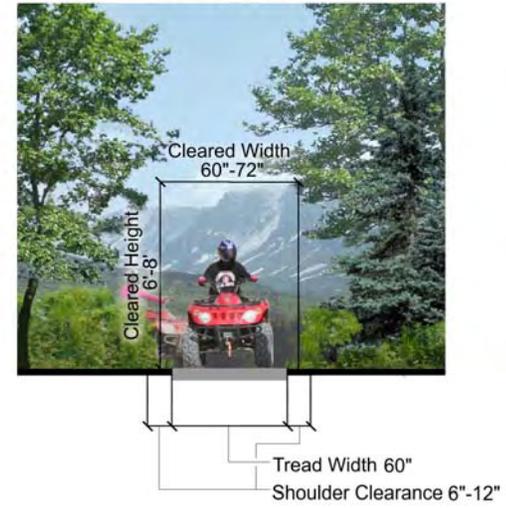
Figure 3.6: All-Terrain Vehicle Design Parameters

Designed Use ALL-TERRAIN VEHICLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	Typically not designed or actively managed for ATVs, although use may be allowed	48" – 60"	60"	60" – 72"	Typically not designed or actively managed for ATVs, although use may be allowed
	Double Lane		96"	96" – 108"	96" – 120"	
	Structures (Minimum Width)		60"	60"	60"	
Design Surface	Type		Native, with limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present	Native, with imported materials for tread stabilization likely and routine grading Minor roughness Sections of soft tread uncommon	
	Protrusions		≤ 6" May be common and continuous	≤ 3" May be common, but not continuous	≤ 3" Uncommon and not continuous	
	Obstacles (Maximum Height)		12" May be common or placed for increased challenge	6" May be common and left for increased challenge	3" Uncommon	
Design Grade	Target Grade		10% – 25%	5% – 15%	3% – 10%	
	Short Pitch Maximum		35%	25%	15%	
	Maximum Pitch Density		20% – 40% of trail	15% – 30% of trail	10% – 20% of trail	
Design Cross Slope	Target Cross Slope		5% – 10%	3% – 8%	3% – 5%	
	Maximum Cross Slope	15%	10%	8%		
Design Clearing	Height	6' – 7'	6' – 8'	8' – 10'		
	Width (On steep side hills, increase clearing on uphill side by 6" – 12")	60" Some light vegetation may encroach into clearing area	60" – 72"	72" – 96"		
	Shoulder Clearance	0" – 6"	6" – 12"	12" – 18"		
Design Turn	Radius	6' – 8'	8' – 10'	8' – 12'		

Class 2



Class 3



Class 4

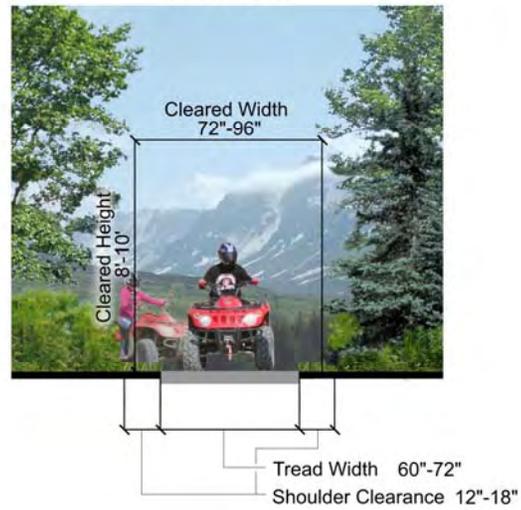
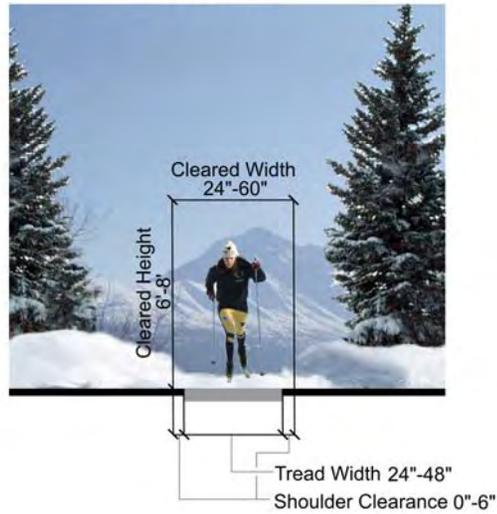


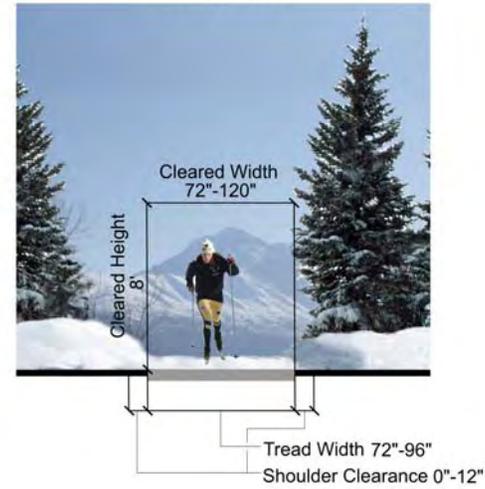
Figure 3.7: Cross-Country Ski (Diagonal/Classical) Design Parameters

Designed Use CROSS-COUNTRY SKI (Diagonal/Classic ski)		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Groomed Width	Single Lane	Typically not designed or actively managed for cross-country skiing, although use may be allowed	24" – 48"	72" – 96"	96" – 120"	Typically not designed or actively managed for cross-country skiing, although use may be allowed
	Double Lane		Typically not groomed	Or width of grooming equipment	Or width of grooming equipment	
	Structures (Minimum Width)		72" – 96"	96" – 144"	144" – 192"	
Design Grooming and Surface	Type		Generally no machine grooming	May receive occasional machine grooming for snow compaction and track setting	Regular machine grooming for snow compaction and track setting	
	Protrusions		No protrusions	No protrusions	No protrusions	
	Obstacles (Maximum Height)		12"	8"	No obstacles	
			Uncommon	Uncommon (no obstacles if machine groomed)		
Design Grade	Target Grade		5% – 15%	2% – 10%	0% – 8%	
	Short Pitch Maximum		25%	20%	12%	
	Maximum Pitch Density		10% – 20% of trail	5% – 15% of trail	0% – 10% of trail	
Design Cross Slope	Target Cross Slope	0% – 10%	0% – 5%	0% – 5%		
	Maximum Cross Slope (For up to 50')	20%	15%	10%		
Design Clearing	Height (Above normal maximum snow level)	6' – 8'	8'	8' – 10'		
	Width	24" – 60"	72" – 120"	96" – 168"		
		Light vegetation may encroach into clearing area	Light vegetation may encroach into clearing area	Widen clearing at turns or if increased sight distance needed		
	Shoulder Clearance	0" – 6"	0" – 12"	0" – 24"		
Design Turn	Radius	8' – 10'	15' – 20'	≥ 25'		
			Or to accommodate grooming equipment			

Class 2



Class 3



Class 4

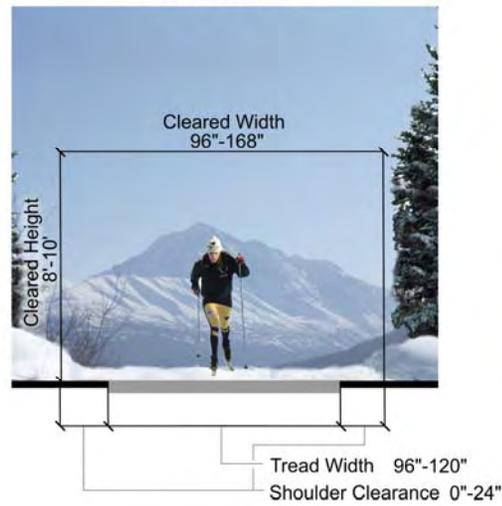
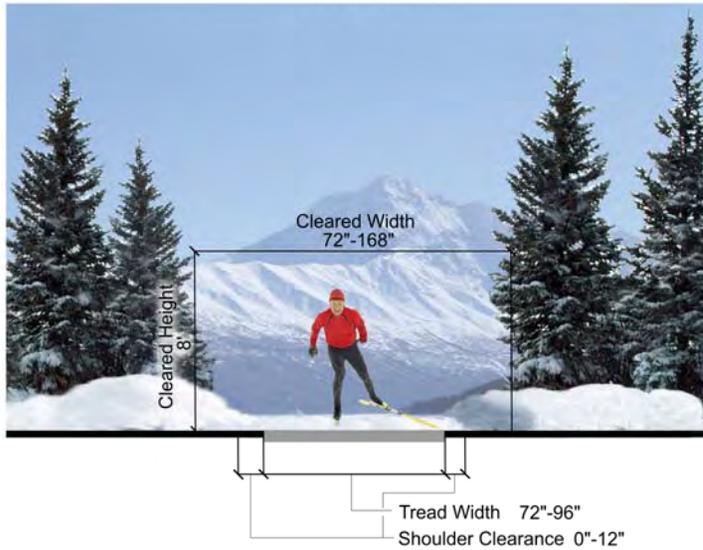


Figure 3.8: Nordic Ski (Skate) Design Parameters

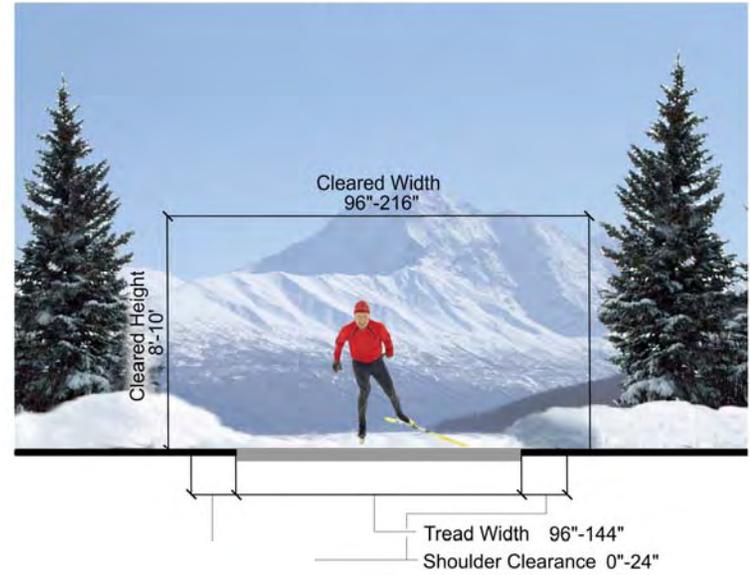
Designed Use NORDIC SKI (Skate Ski)		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Groomed Width	Single Lane	Typically not designed or actively managed for skate skiing, although use may be allowed	Typically not designed or actively managed for skate skiing, although use may be allowed	72" – 96"	96" – 144"	144" - 192"
	Double Lane ¹			Or width of grooming equipment	Or width of grooming equipment	Or width of grooming equipment
	Structures (Minimum Width)			96" – 144"	144" – 192"	168" – 288"
Design Grooming and Surface	Type			36"	36"	36"
	Protrusions			May receive occasional machine grooming for snow compaction and track setting	Smooth compaction using implements designed for creating skate lanes.	Smooth compaction using implements designed for creating skate lanes.
	Obstacles (Maximum Height)			No protrusions	No protrusions	No protrusions
Design Grade	Target Grade			8"	No obstacles	No obstacles
	Short Pitch Maximum			Uncommon (no obstacles if machine groomed)		
	Maximum Pitch Density			2% – 10%	0% – 8%	0% – 6%
Design Cross Slope	Target Cross Slope			20%	20%	20%
	Maximum Cross Slope (For up to 50')			5% – 15% of trail	5% - 10% of trail	5 - 8% of trail
				0% – 5%	0% – 5%	0% – 5%
Design Clearing	Height (Above normal maximum snow level)			15%	12%	10%
	Width			Minimum cross-slope (crowned or one side) should be 2% to promote drainage	Minimum cross-slope (crowned or one side) should be 2% to promote drainage	Minimum cross-slope (crowned or one side) should be 2% to promote drainage
	Shoulder Clearance			8'	8' – 10'	At least 10'
Design Turn	Radius			Or height of grooming equipment	Or height of grooming equipment	Or height of grooming equipment
				72" – 168"	96" – 216"	96" – 312"
				Light vegetation may encroach into clearing area	Widen clearing at turns or if increased sight distance needed	Widen clearing at turns or if increased sight distance needed
			0" - 12"	0" – 24"	0" – 24"	
			15' – 20'	≥ 25'	25' - 30'	
			Or to accommodate grooming equipment	Or to accommodate grooming equipment	Or to accommodate grooming equipment	

¹ Double lane may accommodate a combination of diagonal and skate ski lanes with room to pass.

Class 3



Class 4



Class 5

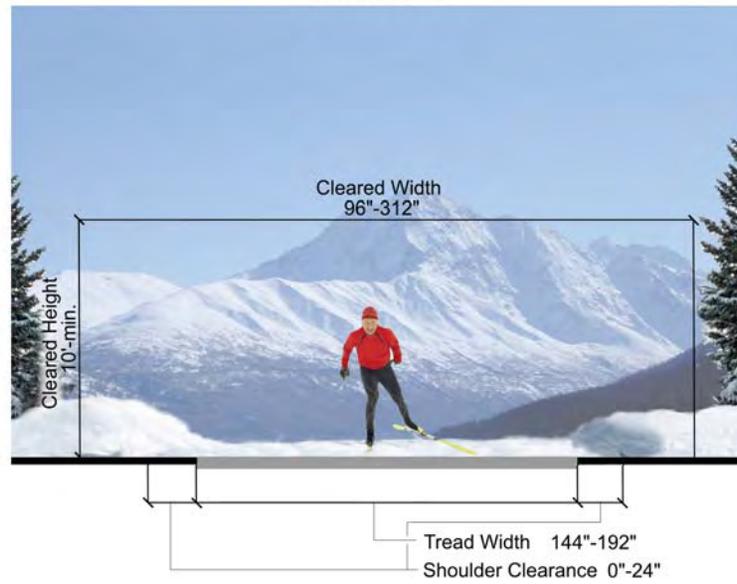
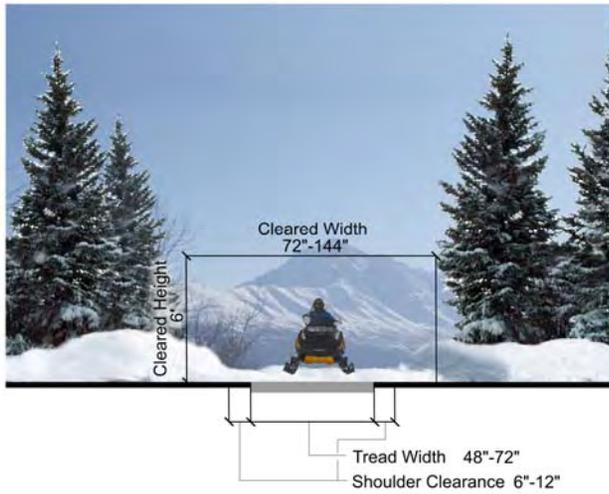


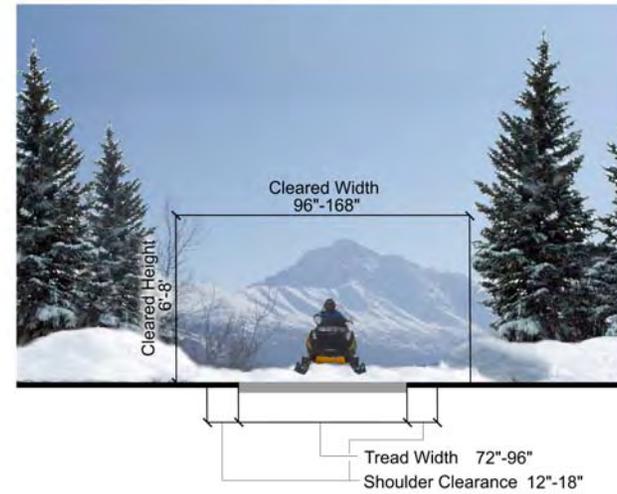
Figure 3.9: Snowmobile Design Parameters

Designed Use SNOWMOBILE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	Typically not designed or actively managed for snowmobiles, although use may be allowed	48" – 72"	72" – 96"	96" – 120"	Typically not designed or actively managed for snowmobiles, although use may be allowed
	Double Lane		Typically not groomed	Or width of grooming equipment. On turns with tight radius, increase groomed width to ≥ 10'	Or width of grooming equipment. On turns with tight radius, increase groomed width to ≥ 12'	
	Structures (Minimum Width)		120"	120" – 144"	144" – 240"	
72"			144"	216"		
Design Surface	Type		Generally no machine grooming Commonly rough and bumpy	May receive occasional machine grooming for snow compaction and conditioning Frequently rough and bumpy	Regular machine grooming for snow compaction and conditioning Commonly smooth	
	Protrusions		No protrusions	No protrusions	No protrusions	
	Obstacles (Maximum Height)		12"	6"	No obstacles	
			Uncommon	Uncommon (no obstacles if machine groomed)		
Design Grade	Target Grade		0% – 12%	0% – 10%	0% – 8%	
	Short Pitch Maximum		35%	25%	20%	
	Maximum Pitch Density	15% – 30% of trail	10% – 20% of trail	5% – 10% of trail		
Design Cross Slope	Target Cross Slope	0% – 10%	0% – 5%	0%		
	Maximum Cross Slope	15%	10%	5%		
Design Clearing	Height (Above normal maximum snow level)	6'	6' – 8'	8' – 12'		
	Width	72" – 144"	96" – 168"	120" – 264"		
	Shoulder Clearance	Some light vegetation may encroach into clearing area	Light vegetation may encroach into clearing area	Widen clearing at turns or if increased sight distance needed		
Design Turn	Radius	6" – 12"	12" – 18"	12" – 24"		
		8' – 10'	15' – 20'	25' – 50'		
			Or to accommodate grooming equipment			

Class 2



Class 3



Class 4

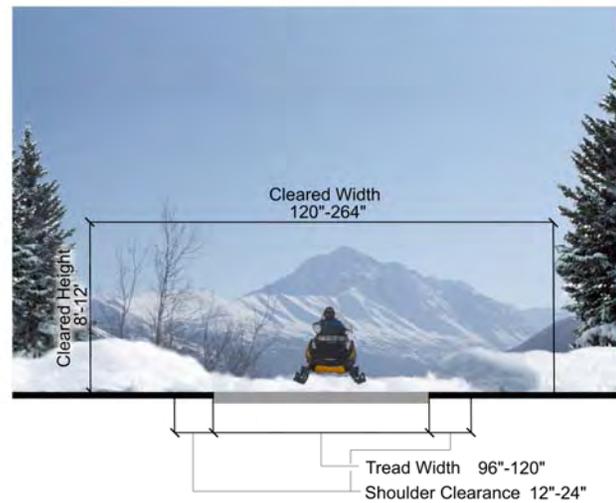


Figure 3.10: Non-Motorized Watercraft Design Parameters

Designed Use NON-MOTORIZED WATERCRAFT*		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Structures	Water route shown on maps and used to access other trails or portages, but with no trail structures, facilities, signs, or recurring maintenance needs along route. Signs and/or parking facilities at initial access points only, and likely associated with other trails or sites.	Few markers or route designators. Low profile structures or facilities occasionally present; primarily to reduce beach and bank impacts. Structures typically consist of native material hardening of portage/water entry points. Signs and/or parking facilities at initial access points only, and likely associated with other trails or sites.	Buoys or markers possible to identify route Typically, facilities provide for improved access and to reduce beach and bank impacts. Well-developed parking and launch facilities at primary access points, but facilities and structures rare along the trail. Interpretive and informational displays typically present at primary access points	Buoys or markers are high profile and may be inter-visible and or route is readily followed. Highly developed launch facilities, docks, and amenities typically proved for user convenience. Well-marked approaches to facilities and portages. Interpretative displays, maps, information kiosks and signs typically present at access points and along route	Typically not designed or actively managed for watercraft, although use may be allowed
Design Surface	Protrusions	May be common and continuous	May be common and continuous	May be common, but not continuous	Uncommon and not continuous	
	Obstacles	May be common or placed for increased challenge	May be common or placed for increased challenge	May be common and left for increased challenge	Uncommon	
Design Clearing		In densely vegetated areas, users will commonly need to lift vessels over logs, shoals, or matted vegetation.	Path is typically narrow, shallow, and may occasionally require user to lift over obstacles or break path through some vegetation and duck under overhanging branches	Path is typically cleared wide enough for ready passage and maneuvering of at least one vessel, and usually two-way vessel passage, with only occasional low overhanging vegetation	Path is consistently cleared wide enough for unhindered, easy passage of two or more vessels.	

* For Portage sections of Water Trails see the “General Criteria” section. Additional design parameters will have to be developed for areas with extensive portages requiring maintenance and attention. Water Trail design parameters are primarily given to provide guidance in applying the appropriate Trail Class. It is important to note that the classes provided here are given for trail purposes only and do not correlate with white water classes assigned to rivers for other purposes.

Class 1



Class 2



Class 3



Class 4

