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## **APPENDIXES**

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# Recreational Trails Act

## ARTICLE 15 RECREATIONAL TRAILS

### Section.

- 37-1501. Act, how cited.
- 37-1502. Legislative findings.
- 37-1503. Trail Development Assistance Fund; created; use; investment.
- 37-1504. Funding; application; grants; section, how construed.
- 37-1505. Administrative costs; limitation; rules and regulations.
- 37-1506. Eminent domain power.
- 37-1507. Boundary fences.
- 37-1508. Warning signs.
- 37-1509. Act, termination.

**37-1501. Act, how cited.** Sections 37-1501 to 37-1509 shall be known and may be cited as the Trail Development Assistance Act.

**Source:** Laws 1991, LB 714, § 1.  
Termination date September 6, 2001.

**37-1502. Legislative findings.** The Legislature finds that the abandonment of railroad rights-of-way in this state provides a unique opportunity to develop a statewide system of recreational trails by which citizens of Nebraska may enjoy the greenways or linear parks that will result and that such trails may act to preserve wildlife habitat and create conservation corridors. The Legislature further finds that it is in the public's interest to develop abandoned railroad rights-of-way and to do so through fostering public and private cooperation.

**Source:** Laws 1991, LB 714, § 2.  
Termination date September 6, 2001.

**37-1503. Trail Development Assistance Fund; created; use; investment.** The Trail Development Assistance Fund is hereby created. The fund shall consist of any direct appropriation by the Legislature and any funds received as gifts, bequests, or other contributions to such fund from public or private entities. The fund shall be administered by the Game and Parks Commission and shall be used to assist in the purchase, development, and maintenance of recreational trails within the state. Any money in the fund available for investment shall be invested by the state investment officer pursuant to the Nebraska Capital Expansion Act and the Nebraska State Funds Investment Act.

**Source:** Laws 1991, LB 714, § 3; Laws 1994, LB 1066, § 24.  
Termination date September 6, 2001.

### Cross References

Nebraska Capital Expansion Act, see section 72-1269.  
Nebraska State Funds Investment Act, see section 72-1260.

**37-1504. Funding; application; grants; section, how construed.** (1) Any natural resources district, political subdivision, other public agency, or private nonprofit organization whose primary purpose is the purchase, development, or maintenance of a recreational trail within the state or any combination thereof may apply to the Game and Parks Commission for funding to assist in the purchase, development, and maintenance of a recreational trail within the state.

(2) The commission shall provide funds to a qualified applicant from the Trail Development Assistance Fund. The funds shall be disbursed to a qualified applicant as a lump-sum grant to be used as matching funds for no more than fifty percent of the total anticipated cost. This section shall not be construed to prevent agreements pursuant to the Interlocal Cooperation Act or any other agreement either before or after the application is submitted for the grant. Qualified applicants who have submitted their completed applications within sixty days following September 6, 1991, shall receive their disbursements by January 1, 1992.

(3) No real property, leased property, easement, right-of-way, or other property interest which is owned, controlled, managed, or maintained by the commission on September 6, 1991, may be the subject of a grant application under this section.

**Source:** Laws 1991, LB 714, § 4.  
Termination date September 6, 2001.

### Cross Reference

Interlocal Cooperation Act, see section 13-801.

**37-1505. Administrative costs; limitation; rules and regulations.** Administrative costs for the administration of the Trail Development Assistance Fund shall not exceed five percent of the appropriation authorized by the Legislature. The Game and Parks Commission may adopt and promulgate rules and regulations to carry out the Trail Development Assistance Act.

**Source:** Laws 1991, LB 714, § 5.  
Termination date September 6, 2001.

**37-1506. Eminent domain power.** The Trail Development Assistance Act shall not be construed to limit the power of eminent domain of the state or its agencies.

**Source:** Laws 1991, LB 714, § 6.  
Termination date September 6, 2001.

**37-1507. Boundary fences.** Whenever abandoned railroad right-of-way trails are developed pursuant to the Trail Development Assistance Act, boundary fences shall be constructed and maintained as required for railroads in sections 74-601 to 74-609 unless such construction and maintenance is waived in writing by affected adjoining property owners. Such fences shall be deemed to be manifestly designed to exclude intruders for the purposes of subdivision (1)(c) of section 28-521.

**Source:** Laws 1991, LB 714, § 7; Laws 1994, LB 846, § 1.  
Termination date September 6, 2001.

**37-1508. Warning signs.** Owners or operators of a trail developed pursuant to the Trail Development Assistance Act shall, at appropriate entry points, place signs warning that departures from the boundaries of the trail as marked by fences or otherwise may result in prosecution for trespass.

**Source:** Laws 1991, LB 714, § 8.  
Termination date September 6, 2001.

**37-1509. Act, termination.** The Trail Development Assistance Act shall terminate ten years after September 6, 1991, and any money in the Trail Development Assistance Fund at such time shall be transferred to the General Fund.

**Source:** Laws 1991, LB 714, § 9.  
Termination date September 6, 2001.

**37-1510. State agency or political subdivision; establish fees.** A state agency or political subdivision which owns or operates a recreational trail may establish and collect a user fee or a voluntary fee for the use of the trail as determined by the state agency or political subdivision. The fees shall be accounted for separately and shall be used for trail maintenance, operation, and acquisition.

**Source:** Laws 1996, LB 296, § 1.  
Effective date July 19, 1996.

**81-815.55. State assents to Intermodal Surface Transportation Efficiency Act; Game and Parks Commission; powers.** The State of Nebraska hereby assents to the provisions of section 1302 of the Intermodal Surface Transportation Efficiency Act cited as the Symms National Recreational Trails Act of 1991 and establishing the National Recreational Trails Funding Program, Public Law 102-240, 102nd Congress. The Game and Parks Commission is authorized, empowered, and directed to perform all acts necessary on behalf of the State of Nebraska to the conduct and establishment of recreational trails and trail-related projects in accordance with such act of Congress for and within the State of Nebraska. The commission may adopt and promulgate rules and regulations to assist in carrying out the purposes of this section. No funds accruing to the State of Nebraska pursuant to the act shall be used in violation of the act.

Source: Laws 1993, LB 235, § 51; Laws 1996, LB 296, § 3.  
Effective date July 19, 1996.

**81-815.56. Recreational Trails Fund; created; use.** There is hereby created a fund to be known as the Recreational Trails Fund. Federal funds advanced to the State of Nebraska through grants-in-aid under the provisions of Public Law 102-240, 102nd Congress, for approved projects shall be remitted to the State Treasurer for credit to the fund. The money in the fund shall be used by the Game and Parks Commission for the purposes of establishing recreational trails and trail-related projects pursuant to such public law.

Source: Laws 1993, LB 235, § 52; Laws 1996, LB 296, § 3.  
Effective date July 19, 1996.

**81-815.57. Repealed.** Laws 1996, LB 296, § 4.

**81-815.58. Recreational trails; public policy.** It is the public policy of the State of Nebraska that (1) abandoned railroad rights-of-way should be kept intact for future possible use as recreation, conservation, communications, and transportation corridors and (2) the laws of the State of Nebraska should be construed to effectuate this policy.

Source: Laws 1993, LB 739, § 1.

**81-815.59. Chicago and Northwestern Railroad; acceptance of gift; authorized; commission; powers and duties; Cowboy Trail Fund; created; use; investment; section, how construed.** (1) Pursuant to the National Trails System Act, 16 U.S.C. 1241 et seq., the Game and Parks Commission is hereby authorized and directed to accept as a gift, when and if offered, from any present or future owner the entire right-of-way of the Chicago and Northwestern Railroad which lies between milepost 83.3 and milepost 404.5 in Nebraska. In the event a portion of the right-of-way continues in actual rail service, the Game and Parks Commission is authorized and directed to accept as a gift the remaining section. So long as the integrity of the right-of-way as an interim recreational trail and for future rail use is not disturbed, the Game and Parks Commission is authorized to lease and to grant easement rights on the right-of-way. All revenue collected from such leases shall

be remitted to the State Treasurer for credit to the Cowboy Trail Fund and shall be used for the development and maintenance of the Cowboy Trail. The commission shall hold the right-of-way for interim trail use as a state recreational trail, to preserve wildlife habitat, and to provide a conservation, communications, utilities, and transportation corridor and for other uses approved by the commission and allowed by the National Trails System Act. The commission shall keep in good repair all crossings over the trail in accordance with its legal obligations, including all the grading, bridges, ditches, and culverts that may be necessary for such crossings within the right-of-way.

(2) The right-of-way may be accepted without any further legislative action or approval of the Governor but only if the State of Nebraska is indemnified in a manner satisfactory to the Game and Parks Commission against the costs of remedial action and environmental cleanup for conditions arising prior to conveyance to the state and the title is free and clear of all liens and mortgage or deed of trust encumbrances.

(3) The commission may accept money from any public or private source for gift-acceptance costs, for the development and maintenance of the trail, or for other uses consistent with the purposes stated in this section. The commission may use funds available in the Trail Development Assistance Fund to carry out this section as provided in section 37-1503. Any money from the Trail Development Assistance Fund so used shall be transferred to the Cowboy Trail Fund.

(4) There is hereby created the Cowboy Trail Fund. Any money in the fund available for investment shall be invested by the state investment officer pursuant to the Nebraska Capital Expansion Act and the Nebraska State Funds Investment Act. Money accepted or transferred pursuant to subsection (3) of this section shall be remitted to the State Treasurer for credit to the fund.

(5) The commission may enter into an agreement with any public entity at any time for the development and maintenance of the trail pursuant to this section.

(6) This section shall not be construed to limit the power of eminent domain of the state or its agencies or of any political subdivision.

Source: Laws 1993, LB 739, § 2; Laws 1994, LB 1066, § 101.

**Cross References**

Nebraska Capital Expansion Act, see section 72-1269.  
Nebraska State Funds Investment Act, see section 72-1260.

**81-815.60. Lease of undeveloped land; when.** If any portions of the right-of-way accepted under section 81-815.59 or 81-815.65 are not immediately developed as a recreational trail or for habitat, the Game and Parks Commission shall use its best efforts to lease undeveloped portions of the right-of-way, with first priority to adjacent landowners, for the purposes stated in section 81-815.59 or 81-815.65 or for other purposes which are not inconsistent with the purposes of sections 81-815.58 to 81-815.63 or section 81-815.65 until such time as a recreational trail or habitat may be developed. Any lease or use allowed shall be subject to all prescriptions of the National Trails System Act.

Source: Laws 1993, LB 739, § 3; Laws 1996, LB 584, § 20.  
Operative date July 19, 1996.

**81-815.61. Responsibility for fences.** The Game and Parks Commission shall have the same responsibility with regard to division fences as a private landowner as provided in sections 34-101 to 34-117, except that in those areas where a recreational trail is developed, the commission shall have the same responsibility as a railroad as provided in sections 74-601 to 74-604.

Source: Laws 1993, LB 739, § 4.

**81-815.62. Sanitary facilities required; camping or open fires prohibited.** If the right-of-way or any portion thereof is used as a recreational trail pursuant to sections 81-815.59 and 81-815.60, appropriate sanitary facilities shall be provided along the trail for the use of persons using the trail. Camping or open fires shall be prohibited on such right-of-way or portion thereof.

Source: Laws 1993, LB 739, § 5.

**81-815.63. Rules and regulations.** If the right-of-way or portion thereof is used as a trail or for other purposes as provided in sections 81-815.59 and 81-815.60 the Game and Parks Commission shall adopt and promulgate rules and regulations to carry out the purposes of sections 81-815.58 to 81-815.63.

Source: Laws 1993, LB 739, § 6.

**81-815.65. National Trails System Act; commission; railroad right-of-way; acquisition; uses; conditions.** (1) Pursuant to the National Trails System Act, and with the consent of the Governor pursuant to section 81-805, the Game and Parks Commission may acquire by gift, devise, or purchase all or any part of a railroad right-of-way in the state proposed to be abandoned for interim trail use. The commission, pursuant to the National Trails System Act, shall hold the right-of-way for one or more of the following uses:

- (a) To provide a state recreational trail open to the public;
- (b) To preserve wildlife habitat;
- (c) To provide a conservation, communications, utilities, and transportation corridor; and
- (d) Other uses approved by the commission.

(2) The right-of-way may be acquired only if the State of Nebraska is reasonably protected in a manner satisfactory to the commission for the costs of remedial action and environmental cleanup for conditions arising prior to conveyance to the state and the title is free and clear of all liens and encumbrances.

(3) The commission may use funds available by gift, appropriation, the Trail Development Assistance Fund, and other appropriate cash funds for uses consistent with those stated in this section and sections 37-1503 and 81-805.

(4) As long as the integrity of the right-of-way as an interim recreational trail and future rail use is not disturbed, the commission may lease and grant easement rights on the right-of-way. Any lease or use allowed shall be subject to all prescriptions of the National Trails System Act. All revenue collected from such leases shall be remitted to the State Treasurer for credit to the Trail Development Assistance Fund pursuant to sections 37-1503 and 37-1504.

## Recreation Liability Act

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### ARTICLE 10 RECREATION LIABILITY ACT

**37-1001. Limitation of liability; purpose of sections.** The purpose of sections 37-1001 to 37-1008 is to encourage owners of land to make available to the public land and water areas for recreational purposes by limiting their liability toward persons entering thereon and toward persons who may be injured or otherwise damaged by the acts or omissions of persons entering thereon.

Source: Laws 1965, c. 193, § 1, p. 589.

**37-1002. Landowner; duty of care.** Subject to the provisions of section 37-1005, an owner of land owes no duty of care to keep the premises safe for entry or use by others for recreational purposes, or to give any warning of a dangerous condition, use, structure, or activity on such premises to persons entering for such purposes.

Source: Laws 1965, c. 193, § 2, p. 589.

**37-1003. Landowner; invitee; permittee; liability; limitation.** Subject to the provisions of section 37-1005, an owner of land who either directly or indirectly invites or permits without charge any person to use such property for recreational purposes does not thereby (1) extend any assurance that the premises are safe for any purpose, (2) confer upon such persons the legal status of an invitee or licensee to whom a duty of care is owed, or (3) assume responsibility for or incur liability for any injury to person or property caused by an act or omission of such persons.

Source: Laws 1965, c. 193, § 3, p. 589.

**37-1004. Land leased to state; duty of landowner.** Unless otherwise agreed in writing, an owner of land leased to the state for recreational purposes owes no duty of care to keep that land safe for entry or use by others or to give warning to persons entering or going upon such land of any hazardous conditions, uses, structures, or activities thereon. An owner who leases land to the state for recreational purposes shall not by giving such lease (1) extend any assurance to any person using the land that the premises are safe for any purpose, (2) confer upon such persons the legal status of an invitee or licensee to whom a duty of care is owed, or (3) assume responsibility for or incur liability for any injury to person or property caused by an act or omission of a person who enters upon the leased land. The provisions of this section shall apply whether the person entering upon the leased land is an invitee, licensee, trespasser, or otherwise.

Source: Laws 1965, c. 193, § 4, p. 590.

**37-1005. Landowner; liability; exceptions.** Nothing in sections 37-1001 to 37-1008 limits in any way any liability which otherwise exists (1) for willful or malicious failure to guard or warn against a dangerous condition, use, structure, or activity, or (2) for injury suffered in any case where the owner of land charges the person or persons who enter or go on the land. Rental paid by a group, organization, corporation, the state or federal government shall not be deemed a charge made by the owner of the land.

Source: Laws 1965, c. 193, § 5, p. 590.

**37-1006. Sections, how construed.** Nothing in sections 37-1001 to 37-1008 creates a duty of care or ground of liability for injury to person or property.

Source: Laws 1965, c. 193, § 6, p. 590.

**37-1007. Obligation of person entering upon and using land.** Nothing in sections 37-1001 to 37-1008 limits in any way the obligation of a person entering upon or using the land of another for recreational purposes to exercise due care in his use of such land in his activities thereon.

Source: Laws 1965, c. 193, § 7, p. 590.

**37-1008. Terms, defined.** For purposes of sections 37-1001 to 37-1008: (1) The term land includes roads, water, watercourses, private ways and buildings, structures, and machinery or equipment thereon when attached to the realty; (2) the term owner includes tenant, lessee, occupant, or person in control of the premises; (3) the term recreational purposes shall include, but not be limited to, any one or any combination of the following: Hunting, fishing, swimming, boating, camping, picnicking, hiking, pleasure driving, nature study, waterskiing, winter sports, and visiting, viewing, or enjoying historical, archaeological, scenic, or scientific sites, or otherwise using land for purposes of the user; and (4) the term charge shall mean the amount of money asked in return for an invitation to enter or go upon the land.

Source: Laws 1965, c. 193, § 8, p. 590.

## Railbanking Law

### Section 8 (d) of the National Trails System Act, 1983, 16 U.S.C. Section 1247 (d)

**Railroad rights-of-way.** The Secretary of Transportation, the Chairman of the Interstate Commerce Commission, and the Secretary of the Interior, in administering the Railroad Revitalization and Regulatory Reform Act of 1976, shall encourage State and local agencies and private interests to establish appropriate trails using the provisions of such programs. Consistent with the purposes of that Act, and in furtherance of the national policy to preserve established railroad rights-of-way for future reactivation of rail service, to protect rail transportation corridors, and to encourage energy efficient transportation use, in the case of interim use of any established railroad rights-of-way pursuant to donation, transfer, lease, sale or otherwise in a manner consistent with the National Trails System Act [16 USCS 1241 et seq.], if such interim use is subject to restoration or reconstruction for railroad purposes, such interim use shall not be treated, for the purposes of any law or rule of law, as an abandonment of the use of such rights-of-way for railroad purposes. If a State, political subdivision, or qualified private organization is prepared to assume full responsibility for management of such rights-of-way and for any legal liability arising out of such transfer or use, and for the payment of any and all taxes that may be levied or assessed against such rights-of-way, then the Commission shall impose such terms and conditions as a requirement of any transfer or conveyance for interim use in a manner consistent with the Act [16 USCS 1241 et seq.], and shall not permit abandonment or discontinuance inconsistent or disruptive of such use.

More than 800 segments of America's rail corridors have become or are in the process of becoming trails for public use. Most rail-trails are in public ownership, however a few are privately maintained for all to use. The following 15 trails have one or more elements in common with the Cowboy Trail. All are railbanked corridors with a length of greater than 50 miles. Five are considered to be all rural and the remainder are a combination of rural and urban/suburban. Only one, the Durant to Henryetta, OK trail, is inactive and has no current plans for development. Six of the trails have their full lengths open for use but will continue to be developed and enhanced for many years to come.

Source: Rails-to-Trails Conservancy, Sept., 1996.

<u>Trail</u>	<u>State</u>	<u>Statu</u>	<u>TrailEnd Pt1</u>	<u>TrailEnd Pt2</u>	<u>Length</u>	<u>Rural</u>	<u>Railbank</u>
<b>Cowboy Trail</b>	<b>NE</b>	<b>PROJ</b>	<b>Norfolk</b>	<b>Chadron</b>	<b>321</b>	<b>Y</b>	<b>Y</b>
Katy Trail State Park	MO	OPEN	St. Charles	Sedalia	185		Y
Milwaukee Road Corridor (John Wayne Pioneer Trail)	WA	OPEN	Iron Horse State Park	Tekoa	145		Y
Chippewa Falls to Superior (includes Rice Lake to Superior)	WI	PROJ	Chippewa Falls	Superior	143		Y
Abilene to Wichita Falls	TX	PROJ	Abilene	Wichita Falls	134.8	Y	Y
East Pasco to Fish Lake	WA	PROJ	East Pasco	Fish Lake	130		Y
Herington to Osawatomie (Flint Hills Nature Trail)	KS	PROJ	Herington	Osawatomie	124.6	Y	Y
Durant to Henryetta	OK	INAC	Durant	Henryetta	123		Y
Mountain-Bay Trail (Delly Trail)	WI	OPEN	Duck Creek (near Green Bay)	Kelly (near Wausau)	83.4		Y
Cypress Bend to Lexa	AR	PROJ	Cypress Bend	Lexa	73.5	Y	Y
OC&E Rail-Trail State Park	OR	OPEN	Bly	Klamath Falls	65.4		Y
Wabash Trace Nature Trail	IA	OPEN	Council Bluffs	Blanchard	63		Y
Pine Creek Gorge Trail	PA	OPEN	Tioga State Forest		62.2		Y
Chaparral Trail	TX	PROJ	Farmersville	Paris	56.5	Y	Y
Chehalis to Raymond	WA	PROJ	Chehalis	Raymond	56.4		Y

## Other Rail-Trails

Demographics-A

A	A	B	C	D	E	F
1	City/Town	Population	Density	County	Natural Resource District	Rec. Planning Region/Dist.
2						
3	Norfolk	21,476	50-100/	Madison	Lower Elkhorn	III-Northeast
4	Battle Creek	997	sq. mi.	Madison		
5	Meadow Grove	332		Madison		
6	Tilden	895		Madison		
7	Oakdale	362	5-15/	Antelope	Upper Elkhorn	
8	Neligh	1,742	sq. mi.	Antelope		
9	Clearwater	401		Antelope		
10	Ewing	449		Holt		VII-North Central
11	Stafford	NA				
12	Inman	159		Holt		
13	O'Neill	3,852		Holt		
14	Emmet	70		Holt		
15	Atkinson	1,380		Holt		
16	Stuart	650		Holt		
17	Newport	136	<5/	Rock		
18	Bassett	739	sq. mi.	Rock		
19	Long Pine	396		Brown	Middle Niobrara	
20	Ainsworth	1,870		Brown		
21	Johnstown	48		Brown		
22	Wood Lake	59		Cherry		
23	Arabia	NA				
24	Thacher	NA				
25	Valentine	2,826		Cherry		
26	Crookston	90		Cherry		
27	Kilgore	79		Cherry		
28	Georgia	NA				
29	Nenzel	8		Cherry		
30	Cody	177		Cherry		
31	Roxby	NA				
32	Eli	3		Cherry		
33	Merriman	151		Cherry		

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# Facilities

## Facilities-B

B	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	City/Town	drink H2O	toilets	showers	grills/bbq	picnic tbls	tent camp.	RV camp.	motels	B&Bs	horse pasture	parking	cafes	grocer	bank ATM	laundry	shops	local park	State Rec. Area	Fed.Rec.	Permit		Comments
2																							
3	Norfolk	X	ADA	X	X	X	city park	w/elec.	several			A;Tr	several	several	yes	yes	many	several					
4	Battle Creek												two					yes					
5	Meadow Grove	X	X		X	X	wayside pk.	X			maybe	A;Tr	two	yes			2	yes					
6	Tilden	X	ADA	X*	X	X	city park	hook-ups	one			A;Tr	several	yes			several	yes					*showers locked but available
7	Oakdale					X		no					two	yes									
8	Neligh	X	ADA	X	X	X	park & lake	hook-ups	two	one*	yes	A;Tr	several	several	yes	yes	several	yes					*also historic B&B at Elgin, 11 mi.
9	Clearwater	X	X		X	X	10 miles	10 mi.-Neligh			yes	A;Tr	several	yes			2	yes					
10	Ewing	X	X															yes					
11	Stafford																						
12	Inman	X	X			X	city park	X					one	yes				yes					additional camping, 10 mi. W
13	O'Neill	X	ADA	X*	X	X	city pk & lake	hook-ups	several		yes	A;Tr	several	several	yes	yes	several	yes					*showers being built
14	Emmet	X	X	X*	X	X	5 tents	hook-ups			yes	A;Tr	one			yes	3	yes*					*being built w/new campground
15	Atkinson	X	X		X	X & at SRA	SRA only	1mi.;hook-ups	one		yes	A;Tr	several	several	yes	yes	several	yes	W., 1 mile		fee		
16	Stuart	X	ADA	X	X	X	city park	5/elec.		one	yes	A;Tr	several	three	yes	yes	several	yes					
17	Newport	X				X	city park	no			yes	A	two	yes			several	yes					
18	Bassett												two	yes				2					
19	Long Pine	X	X	*		X & at SRA	* & SRA-free	hook-ups	cabins&*		*	A;Tr	two	yes	yes	yes	yes	yes	N 1 mi., W 1 mi.		fee		*facilities being built
20	Ainsworth	X	X	X	X	X & at SRA	SRA-free	30/elec.	several	one	yes	A;Tr	several	several	yes	yes	several	yes	E 8mi.to LP SRA	X	fee		
21	Johnstown	X	X/ADA		X	X	park,fair,SRA	hook-ups				A;Tr	two	yes			several	yes	SW 20 mi.		fee		ADA toilet at Village Store
22	Wood Lake	X	X		X	X	4 tents	hook-ups				A;Tr	two	yes				yes					
23	Arabia																						
24	Thacher																						
25	Valentine	X	X	X	X	X & at SRA	several	3/hook-ups	several	3		A;Tr	several	several			several	yes	SW 25 mi.		fee		other camping within 5 miles
26	Crookston														yes	yes	*	yes					*business in. light mftg., welding
27	Kilgore	X				X	city park	no					one	yes									
28	Georgia																						
29	Nenzel	X	X			X	SRA-free	FRA-23 pads			yes	A						yes		S 9 mi.	no fee		
30	Cody	X	X			X		elec.										yes					
31	Roxby																						
32	Eli												yes	yes									
33	Merriman	X	ADA	*	X	X & at SRA	X & SRA-free	hook-ups	one	one	yes	A;Tr	two	yes				yes	E 1/2, S 1/2 mi.		fee		*showers to be built
34																							
35			ADA=disabled access										A=auto										
36												Tr=Horse Trailer											

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Activities & Trails-C

C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
1	City/Town	canoe/boat	rafting/tubing	swimming	ball fields	golf	tennis	play equip.	fishing	bird watching	wildlife observe	music	movie	theatre	arts/culture	worship	other trails:	walk/jog	horse	bike	near-by	open	planned	possible	Comments:		
2																											
3	Norfolk			pools, YMCA	yes	yes	yes	yes	yes			yes	2	2	art center	several	4	X		X	X						
4	Battle Creek			pool												3											
5	Meadow Grove	yes	yes	Buffalo Creek	yes			yes	yes	yes	Yellow Banks Rec. Area					2	yes	X	X		X	X				Meadow Grove Fun Days, July	
6	Tilden			pool	yes*				yes-pond	yes	Tilden Park*				interp. centers*	5	yes*	X		X			X			*being built as Old Ice Trail, Tilden Park w/prairie, ice interp.	
7	Oakdale																										
8	Neligh			pool	yes	9-hole	yes	yes	Penn Lk.				1			several	Riverside	X	X	X			X				
9	Clearwater	yes			yes	9-hole		yes								4										*last full weekend, June	
10	Ewing					9-hole	yes	yes																			
11	Stafford																										
12	Inman				yes			yes								1											
13	O'Neill			pool	yes	yes	yes	yes	Goose Lk.	yes & tours	yes & nature walks	yes*	1	1	local shows	13	local	X	X	X						*summer band concerts	
14	Emmet		tubing	river, lake					yes	yes & tours	yes							X	X		X	X*	x			*trail rides, guides to farms, center pivots, haying, etc.	
15	Atkinson	boat-SRA 1 mi.		pool	yes	9-hole	yes	yes	SRA; gravel	yes-Blue Bird Tr.	Blue Bird Trail				local crafts	7	Blue Bird	X		X	X					Hay Days Celebration	
16	Stuart				yes	9-hole	yes	yes								2		X			X					July 4 Celebration; summertime community activities	
17	Newport						yes	yes								1								X			
18	Bassett																										
19	Long Pine		tubing		yes		yes		SRA	yes	yes	drive-in				3											
20	Ainsworth		tubing	pool	yes	9-hole	yes	yes	SRA; river; lake	yes	Nature Conservancy*	1 + drive-in	1	arts council	13	yes	X				X*	X	X			*N.C. preserve N 12 miles, inc. buffalo herd, trails	
21	Johnstown	canoe-15 mi.	tube-15 mi.			4 mi.			1.5 mi.	yes	Nature Conservancy				movie set*	1								X		*Main St. was CBS stage set for "O Pioneers" film	
22	Wood Lake*															1										*formerly called Cottonwood Lake	
23	Arabia																										
24	Thacher																										
25	Valentine	on Niobrara R.*	on Niobrara R.*	pool	yes	yes	yes		SRA	at Natl. Wildlife	SRA; Ft. Niob. Refuge	yes	1		Native Am.-near	12										*rated in top 10 by Backpacker Magazine	
26	Crookston																										
27	Kilgore	Niobrara R.						yes							Native Am.*	1				X					X	Rosebud Reservation, N 18 miles	
28	Georgia																										
29	Nenzel	Niobrara R.	Niobrara R.		basketball			yes	FRA	Natl. Forest	Natl. Forest					1	in McKelvie	X	X	X	X						
30	Cody				yes		yes																				
31	Roxby																										
32	Eli																										
33	Merriman	boat-SRA 1 mi.	Niobrara R.-9 mi.					yes	SRA							3							X	X			
34																											
35		SRA = State Recreational Area; FRA = Federal Recreation Area																									
36																											

# History

## History-D

D	A	B	C	D	E	F	G	H	I
1	City/Town	founded	museum	historic event	historic/famous personality	historic structures	archeological site	Comments:	
2									
3	Norfolk		Elkhorn Valley	logging (Deer Trails)	Johnny Carson, Hall Bros., Thurl Ravenscroft, etc.	McMill Bldg., The Kensington			Hall of Hallmark Cards; Ravenscroft-voice of Tony the Tiger
4	Battle Creek								
5	Meadow Grove	1871	art; M.G. History	est. as timber claim		post office, homes*, grist mill			*Warrick, Lewis homesteads
6	Tilden			ice harvesting center	Richie Ashburn; L.Ron Hubbard	ice house; opera house			Ashburn-baseball; Hubbard-author/humanitarian
7	Oakdale								
8	Neligh	1873	flour mill; County	Poncha Trail of Tears	White Buffalo girl	courthouse, bridges	Ashfall 'dig'-N 15, W 7 mi.		Poncha commemorates prairie fires; 11 mi. S. in Elgin
9	Clearwater					singing bridge	Ashfall-N 10, E 4 mi.		
10	Ewing						Ashfall-N 6, E 8 mi.		
11	Stafford			ghost' town					
12	Inman	1905*							
13	O'Neill	1873	Kinkaid Bldg.		Kinkaid, O'Neill; Wade, Middleton	courthouse, Kinkaid Bldg.	Ashfall -SE 13, E 13 mi.		*Pioneer Townsite Co.
14	Emmet	1881			Dan Finnigan	sod house, bank, 1883 home			Moses P. Kinkaid, legislator, 640-acre Homestead Act
15	Atkinson	1880	yes, 1896	invent-center pivot irriga.			fossils, arrowheads		
16	Stuart	1887	White Horse		Kid Wade, Doc Middleton*	bank, church, elevator, auditorium	Kid Wade Canyon		*alleged outlaws; also Thompsons' White Horse Ranch
17	Newport	1883				various buildings			
18	Bassett	1884							
19	Long Pine	1881	Heritage House		Wade, Middleton, Jesse James	RR bridge, hotel, school, bank, etc.			several structures built 1900-1911
20	Ainsworth	1883	Park; Hist. Soc.	WW II Training Air Base	Morris Skinner, Nannie Osborne	houses, sod school, log cabins	Devil's Gulch, Sand Draw		Skinner-paleontologist; Osborne-pioneer business woman
21	Johnstown	1882				Berry Bridge			
22	Wood Lake	1883*							*Pioneer Townsite Co.
23	Arabia			ghost' town					
24	Thacher			ghost' town					
25	Valentine	1884	SandHills; County			RR & highway bridges; schoolhouse	dig' east end of RR bridge		Old Indian Agency at Ft. Niobrara, NWR
26	Crookston	1890							
27	Kilgore	1885				log cabins			
28	Georgia			ghost' town					
29	Nenzel	1885					fossils, arrowheads		
30	Cody	1885							
31	Roxby			ghost' town					
32	Eli	1895							
33	Merriman	1885	Bowring Ranch		Senator Eve Bowring	Bowring Ranch	fossils, arrowheads		

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# Inventories

Nature-E

E	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	City/Town	river	wetlands	geology	scenic view	birds	animals	flowers/plants	rare/endangered	rainfall avg.	temp. range Jan. - July	prairie/forest <1850		Comments:
2														
3	Norfolk	Elkhorn							bald eagle	24-26"	19.4 - 77.0	tall prairie grass		
4	Battle Creek									↓		↓		
5	Meadow Grove	Buffalo Cr., Elkhorn	meadows		Yellow Banks	eagle	deer,	wild flowers		22-24"		mixed grass		good shade trees; open meadows
6	Tilden	spring-fed creek					coyote					sandhills prairie		prairie, wildflower restorations planned
7	Oakdale													
8	Neligh	Elkhorn												
9	Clearwater	Elkhorn								↓				
10	Ewing	Elkhorn, South Fork								20-22"		shelterbelt		
11	Stafford													
12	Inman			fossil beds		pheasant								
13	O'Neill	Elkhorn	meadows	sandy soil	begin Sandhills	wild turkey			eagle					
14	Emmet	Elkhorn	meadows			ducks		chokecherry,						
15	Atkinson	Elkhorn		sand/gravel		geese		plum						ostrich farm along trail
16	Stuart	Elkhorn	meadows	sand/gravel										
17	Newport	Elkhorn	meadows											
18	Bassett		north, east				antelope,		whooping crane					
19	Long Pine	Long Pine Creek			RR bridge	↓	deer,	wild flowers	on migratory paths					pine trees are predominant
20	Ainsworth	Niobrara R., Bone Cr.	south	sandhills		song birds	bison			↓				developing Sandhills Interp. Center
21	Johnstown	Plum Creek	south, east	sand/gravel	Plum Cr. RR bridge				bald eagle,	18-20"				surrounded by trees
22	Wood Lake								western prairie					
23	Arabia								fringed orchid					
24	Thacher							plum,						
25	Valentine	Niobrara R.	east	sandhills	RR bridge	wild turkey,	deer,	chokecherry,	bald eagle,		20.0 - 75.4	pine woodlands		
26	Crookston	Minnechaduza Cr.				ducks,	antelope	yucca	American					
27	Kilgore	Niobrara to South	meadows			swan,			burying beetle					
28	Georgia					pelican,		grasses						
29	Nenzel	Niobrara		sandhills		shortbirds,								exceptional skies for star gazing
30	Cody					geese								
31	Roxby													
32	Eli		marsh							↓				
33	Merriman		north, east							16-18"				
34														
35														
36														

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# Restrooms

## INTRODUCTION

San Dimas Technology and Development Center published a 59-page manual in 1991 titled 'In-Depth Design and Maintenance Manual for Vault Toilets'. For an in-depth explanation of the design principles necessary to have an odor free toilet, please refer to the above manual. This manual is currently available from:

USDA Forest Service  
444 East Bonita Ave.  
San Dimas, CA 91773  
Phone (909) 599-1267  
FAX (909) 592-2309  
DG Pubs:W07A

This publication addresses (in abbreviated form) the same principles necessary to determine if a building meets all of the requirements to be odor free. The theory behind an odor free toilet is simple. Get the air to flow into the building's user compartment, down the toilet riser, through the vault, and up out of the vent stack. Prevent the adsorption of odors by using non-porous construction materials. The building should also be easy to clean and maintain, vandal resistant, and fully accessible.



Figure 1—Smoke bomb demonstration of correct air flow.

Many manufacturers of prefabricated vault toilet buildings are following most of the correct principles, but may be omitting some too. Some prefabricated buildings that are correctly designed

are being installed in locations where they will not work as intended. This publication reviews all the correct principles and, if followed, will result in an odor free toilet.

## DEFINITIONS

**Chimney effect:** The tendency of air in a vertical passage to rise when it is heated because its density is lower than that of the surrounding air.

**User's Compartment:** The inside of a toilet building.

**Vault Vent Stack:** A vertical pipe, 12 to 14 inches (0.3 to 0.36 m) in diameter, that extends from the toilet vault to three or more feet (1 m+) above the highest point of the building roof.

**Wall Vent:** An opening in the wall that allows outside air to enter the building's user compartment.

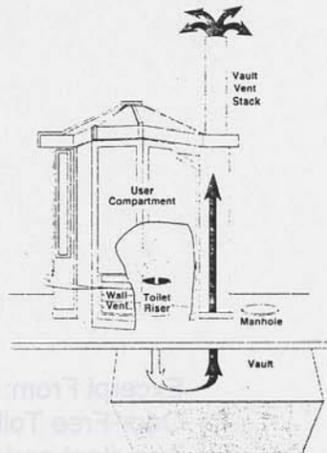


Figure 2—Vault toilet diagram.

## AIR FLOW

The primary concern for passive building ventilation is air flow. Wind currents and solar radiant energy are the natural forces that cause air to move. A 2-mph (3.2 km/h) wind will ventilate a

toilet building that is designed to fully use the wind currents for odor control. Solar radiant energy can cause a chimney effect in dark vent stacks oriented to receive the maximum sun light. The chimney effect can be increased by building a dark-colored metal shroud around the vent stack. Every effort should be made to take full advantage of the energy from both the wind and the sun.

Solar radiant energy is only effective for that part of the day that the vent stack is in sunlight. Wind currents are effective anytime. In those situations when a building cannot be oriented to take maximum advantage of both sources of energy, the wind's energy contribution usually should be maximized.

Avoid installing passively ventilated vault toilets in locations that do not receive either sunlight or wind, such as in dense brush and heavy tree canopy. The vault toilet will need another form of energy to keep it odor free when sunlight and wind are not available. A solar electric panel and fan mounted above the tree canopy is one alternative.

## AIR VENT FOR THE BUILDING'S USER COMPARTMENT

A wall vent is necessary to let air into the building's user compartment. The objective is to cause an increased pressure in the user compartment, forcing air down the toilet riser. When placing the vent in the building wall, always consider where to put the vent to let the most air into the building.

1. There shall be only one vent opening into a building's user compartment.

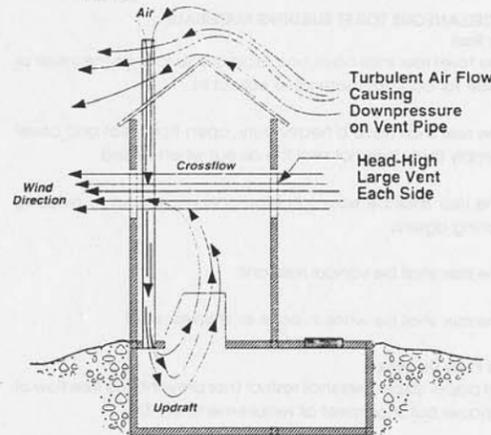


Figure 3—NEVER PUT TWO WALL VENTS IN A BUILDING'S USER COMPARTMENT. Cross-flow through the user compartment can cause an updraft on the toilet riser, resulting in odor in the user compartment.

2. The vent shall be placed on the side of the building that faces the prevailing wind. The required vent location shall be specified after building orientation and prevailing wind patterns are known.

3. If there is a predominant prevailing wind, the vent can be installed at the top of the building wall facing the prevailing wind. This will help prevent heat buildup inside the compartment. If there are fluctuating winds, the vent should be placed low on the building wall facing the side that still gets the prevailing wind. Do not put the air vent in the door and then build a privacy screen around the door. ALWAYS CONSIDER HOW TO GET THE MOST WIND INTO THE BUILDING'S USER COMPARTMENT.

4. The size of the vent shall be approximately 120 sq. in. (77470 sq. mm) of free area. Screened vents should be 12" X 12" (0.3 m X 0.3 m) to account for the space the screen takes up. The vent shall be of a heavy duty material, such as expanded metal, to prevent vandalism.

5. Every user compartment shall have a separate wall vent exposed to the prevailing wind.

6. Trim brush away from the vent to allow unrestricted air movement.

## VENT TO ASPIRATE ODORS OUT OF THE VAULT

A vent stack is necessary to remove air from the toilet vault and exhaust it to the atmosphere. The vent stack must extend high enough above the building roof to avoid the turbulent air caused by the roof. A smooth air flow across an open vent stack will create a negative pressure in the stack, drawing air out.

1. The vault vent stack shall be a MINIMUM of 12 inches (0.3 m) in diameter. Each vault shall have a separate vent stack.

2. The vent stack shall extend a MINIMUM height of 3 feet (1 m) above the highest point of the roof, to avoid turbulent air flow.

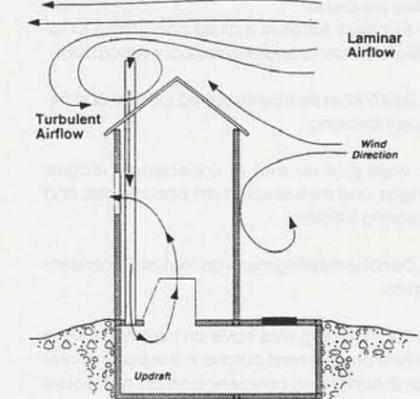


Figure 4—Turbulent air movement caused by building can cause air to flow down vent stacks that do not extend high enough above the roof.

3. The vent stack shall be a dark color to take advantage of the chimney effect created as the sun heats the pipe.

4. The top of the vent stack shall remain uncovered and unscreened. If a cover is absolutely necessary, use a flat plate placed a pipe diameter (12 in (0.3 m)) above the pipe and connected with thin metal rods so as not to interfere with the aspiration effects of the wind blowing over the open top pipe.

At locations where there is little wind, increasing the size of the vent stack to 14 inches (0.36 m) will help increase draft. At locations with much underbrush, or where the downwind flow from the vent stack will drift over use areas, raise the pipe five to ten feet (1.5 m to 3 m) above the highest point of the roof to better disperse the odor.

## THE VAULT

The vault must be leak-proof, easy to pump, durable, and impervious to harsh chemicals.

1. There shall be one vault for each toilet riser.

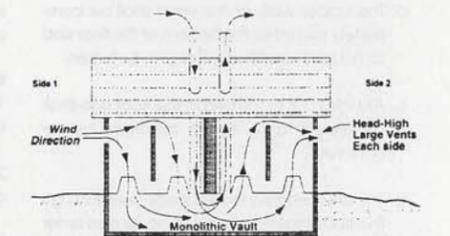


Figure 5—Cross-connection can cause a user compartment on the lee side of the building to be filled with odor.

2. The vault shall have a bottom slope of 8% from under the toilet riser to the outside manhole so that the waste can be more easily removed and very little waste remains after pumping.

3. The vault shall have a 24-inch (0.6 m) diameter (minimum) lightweight manhole cover installed to the rear of the building. Raise the cover so the surrounding concrete can slope away from the cover with a minimum slope of 4%. The cover must form a tight seal so that no air or water can enter.

4. The depth of the vault shall be no deeper than 4-1/2 to 5 feet (1.4 to 1.5 m), to allow for removal of large debris.

5. The vault or vault liner shall be impervious and corrosion proof.

6. The vault should have a black or dark interior to help conceal the waste.

# Amenities



7. If a concrete vault is used, the following conditions shall be adhered to:

- a. All interior surfaces of the concrete vault-bottom, sides, and top-shall be completely sealed with a black or dark coating material that will withstand the corrosive elements of the waste and remain sealed. Remember, the contractor who pumps the vaults will allow the 4 to 6 inch (101.6 to 152.4 mm) hose end to drop into the vault. The hose end is usually steel and can damage the interior coating.
- b. The upper walls of the vault shall be completely sealed to the bottom of the floor slab so no air or water can seep in between.
- c. All holes cut or formed in the floor slab shall be sealed so no odor is absorbed by the concrete.
- d. The area where the vent stack goes through the floor shall be sealed so no air can enter the vault except down through the toilet riser.
- e. The concrete shall be alkaline resistant in case a leak does occur in the coating material.

Following these principles will prevent vault odor from entering the building's user compartment. The building's interior must be constructed to prevent odor adsorption and allow easy, thorough cleaning. Unsealed surfaces will adsorb odor from spills.

**BUILDING INTERIOR**

Finish the building interior to prevent odor adsorption. Make the building interior as easy to clean and maintain as possible. Design the interior of the building to conform to the Uniform Accessibility Standard (UFAS). Clean, well-maintained buildings are also subjected to less vandalism.

**FLOOR SURFACE**

- 1. The floor shall be completely sealed to prevent any staining or odor absorption.

- 2. The building floor shall slope from the rear of the toilet to the front door and shall follow all UFAS requirements for floor slopes.

- 3. The floor shall have a non-slip surface only in the walkway area. Keep the area next to the walls smooth. This makes cleaning easier.

- 4. Bevel and seal the floor-to-wall joint. This prevents waste material or cleaning material from accumulating in the joint.

- 5. The interior floor shall join the outside concrete so there is no lip or sill at the door to hinder the people with disabilities from entering.

**WALLS AND CEILING**

- 1. All interior surfaces shall be non-porous to facilitate cleaning and prevent odor adsorption.

- 2. Wall finishes shall be designed for easy and frequent cleaning.

- 3. Walls shall be free of unnecessary ledges, angles, and shelves so less dirt accumulates and cleaning is easier.

- 4. Do not use ceiling materials that allow condensation.

- 5. Each building shall have an insulated ceiling to help prevent heat buildup in the building interior. Buildings with concrete roofs do not require insulation.

- 6. Reinforce walls for the installation of grab bars, urinals, and toilet paper holders.

**LIGHTING**

- 1. Do not install skylights where they can direct light down the toilet riser and illuminate the waste. Skylights are difficult to keep clean and frequently leak.

- 2. Use polycarbonate (Lexan) glazing in place of glass for all windows. Use frosted or translucent glazing to maintain privacy.



**MISCELLANEOUS TOILET BUILDING MATERIALS**

**TOILET RISER**

- 1. The toilet riser shall have no cracks or crevices on the inside or outside for odorous material to collect in.

- 2. The riser shall have a heavy duty, open-front seat and cover assembly that does not seal the air out when closed.

- 3. The riser shall be easy to clean and impervious to oxidizing cleaning agents.

- 4. The riser shall be vandal resistant.

- 5. The riser shall be white in color, or stainless steel.

**TOILET PAPER DISPENSER**

Toilet paper dispensers shall restrict (not prevent) the free flow of the paper but shall meet all requirements of ADA.

Following these principles to keep vault odor out of the user compartment, and preventing odors from permeating the building's interior surfaces, will allow the interior of the building to be odor free. Proper placement of the building on the site is critical to make these principles function properly. The air leaving the vent stack still has the same odor associated with outdoor vault and pit toilets. Placement of the building on the site is critical to prevent the odor that leaves the building from adversely effecting surrounding use areas.

**PLACEMENT OF THE BUILDING**

A site evaluation must be completed before selecting a toilet type. The site evaluation should identify critical items like prevailing wind direction, toilet access from use areas, available building locations, amount of brush and tree canopy, etc. Passive ventilation principles will not work in all areas.

After choosing a passive ventilation vault toilet, and insuring that all the principles are correct pertaining to the building design, make sure the building is placed correctly on the ground.

- 1. Place the building to take advantage of the energy from the wind or sun or, preferably both. When selecting a site and an orientation for the building, think about how to have the prevailing wind blow against the building vent or how to have the wind blow across the top of the vent stack. If there is very little wind at a particular site, consider how to have the sun shine on the back of the toilet building to heat the black pipe and/or the metal shroud (surrounding the pipe).

- 2. Install the building's wall vent on the correct side of the building.

- 3. Never place two buildings in line with each other if one building will block the prevailing wind from hitting the other building. Offset the buildings so the wind will hit both buildings equally.

- 4. Place the building so the odors emitted from the vent stack will not effect campgrounds, picnic areas, boat launch areas, or visitor information areas.

- 5. **DO NOT** place passively ventilated vault toilet buildings:

- a. In a hollow
- b. Beneath an overhang
- c. On the lee side of a ridge
- d. Immediately next to a dense tree line
- e. In dense brush or trees
- f. In a depression where surface water will accumulate

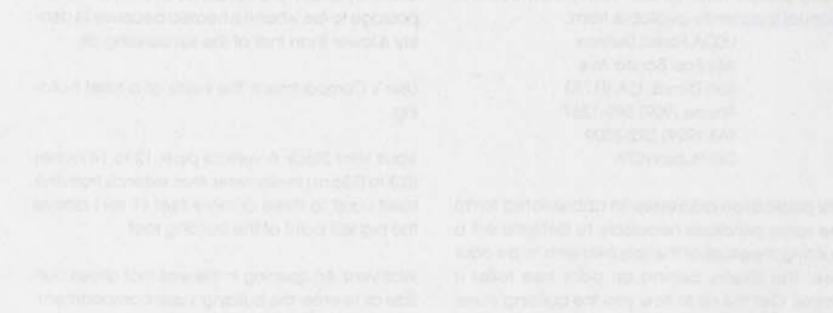
- 6. In dense brush or tree cover, trim limbs and/or foliage to the same height as the top of the vent stack. Remove foliage that blocks the prevailing wind path to the vent stack.

Passive ventilation toilet buildings will not work in some locations. If the building must be placed in an area that receives neither wind nor sun, consider using a fan in the vent stack and offset the solar panel so that the sun will strike the panel. A gas flame in the vent stack, a filter and fan in the vent stack, or venting off-site (piping the vault odors away from the use area) are additional alternatives



to minimize the odor impact from a vault toilet. Venting off-site requires a fan to be placed in the pipe. If electricity is not available, consider installing solar power.

If a toilet building must be located at a particular spot but the odor from the vent stack is going to cause a problem with a surrounding use area, consider a composting or biological conversion toilet instead. The odor from this type of toilet is negligible.



Excerpt From: Guidelines for Selecting An Odor-Free Toilet, Briar Cook, Re-Employed Annuitant and Brenda Land, Sanitary Engineer, August, 1996.

A publication of the United States Department of Agriculture, Forest Service Technology and Development Program, Technology and Development Center, San Dimas, CA 91773

## SUMMARY

Composting toilets have a place among Forest Service human waste management options. Even units that are failing to achieve maximum decomposition may be considered partially successful, if visitor satisfaction is the highest priority.

Composting toilets should not be arbitrarily selected as the option of choice. All waste management options should be considered during the planning stage and the most appropriate option selected for the site. Composting is the method of choice when:

1. It is not economical or feasible to pump a vault.
2. A flush toilet is preferred but not feasible.
3. Odor from an SST toilet vent stack would adversely affect the recreational user.

Consider the advantages and disadvantages of composting toilets compared to other waste management methods.

### Advantages:

- Functioning compost toilets are odor free in the use compartment. Very little offensive odor vents to the outside.
- They have very high customer satisfaction.
- Composted sludge may not need to be removed for several years (depending on level of use).
- A properly functioning compost digester reduces the mass, weight, and odor of fecal material.
- The material removed from a functioning compost digester can be disposed of by incorporation into the soil or burying near the site (depending on regulating agency, unit policy, and location).

All of the advantages of compost toilets are lost if they are designed without special attention to maintenance. The additional design time spent making an aesthetically pleasing compost toilet building functional is well worth the effort.

### Disadvantages:

- Compost units cost more. Initial cost of composting toilets can be \$5000 to \$10,000 more than the same building design for a vault toilet.
- Annual operation and maintenance cost of the compost digester is \$500 to \$1000 per year (not including routine cleaning and stocking of toilet paper). This varies by season of use and cost of wood chips or other bulking agent. The cost to pump a vault and dispose of the sewage is about \$100 per year (varies widely in some areas).

- Composting toilets need an increase in maintenance time of 1/2 hour to 2 hours per week. With staff cutbacks and overworked maintenance personnel, this is a big disadvantage.

Cleaning out a compost digester that is not working due to over use, equipment failure, lack of maintenance, or chemical contamination, is an extremely odious job. Maintenance workers shovel the raw sewage out of the tank (into buckets or barrels) and transport it to a sewage disposal facility.

Proper maintenance of composting toilet requires adequate staffing, training, and funding. The biomass needs consistent maintenance to keep it aerobically composting. If the maintenance personnel can't or don't spend the time to maintain the unit, it will become septic or anaerobic. Maintenance workers should be involved in the decision to install a compost toilet, and should have the opportunity to visit a properly operating unit and talk to the maintenance staff.

Attention to maintenance requirements is critical during the design of a composting toilet. Do not allow aesthetics to take precedence over the function and maintenance of any type of toilet system. A beautiful building that smells bad or doesn't work will not meet visitor expectations.

Consistent routine maintenance is vital to the operation of compost toilets. A knowledge of the composting process will help maintenance workers recognize and correct problems before they become critical. A complete operation and maintenance guide should be present at each site and office.



Figure 8. Yoho National Park, Canada. Recirculating solar heated air and fully insulated foundation keep the biomass warm enough to decompose at this high altitude northern location. The rustic look of cedar slab siding fits in this remote location.



Figure 9. Yoho National Park, Canada. The building, designed by Sunegy Systems LTD, Canada, is fully accessible.

Summary From: Composting Toilet Systems, Planning, Design and Maintenance, Brenda L. Land, Sanitary Engineer, July, 1995.

A publication of The United States Department of Agriculture, Forest Service Technology and Development Program, San Dimas Technology and Development Center, San Dimas, CA 91773.

## Benches/Picnic Tables



### Bench 98

- Choice of two wood sizes
- Also available with recycled plastic (see page 24)

#### Materials

Slats: 2" x 4" nom. or 3" x 4" nom. in choice of Clear All Heart, Free of Heart Center Redwood or Clear Douglas Fir with clear preservative.

Supports: Cast iron.  
Bracing: 1-1/16" O.D. steel pipe.  
Fasteners: Stainless steel and plated.  
Finish: See inside front cover for choice of polyester powder finish. (Green shown.)

### Bench 50

- Profiled wood slats
- 5/8" thick steel supports

#### Materials

Slats: 4" x 4" nom. in choice of Clear All Heart, Free of Heart Center Redwood or Clear Douglas Fir with clear preservative.

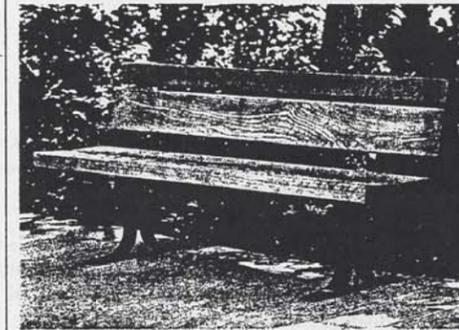
Supports: 5/8" x 3" steel bar.  
End Straps: 1/2" x 3" steel bar.  
Center Contour Strap: 3/8" x 2" steel bar.  
Fasteners: 3/8" diameter stainless steel screws.  
Finish: See inside front cover for choice of polyester powder finish. (Bronze shown.)

#### Support Options

S-1 Embedment  
S-2 Surface Plate  
S-3 Gull-Wing  
S-4 Sub-Floor

**Redwood Benches**  
50-60R 6' long, 335 lbs. \$557  
50-80R 8' long, 390 lbs. \$673

**Douglas Fir Benches**  
50-60D 6' long, 293 lbs. \$548  
50-80D 8' long, 344 lbs. \$611



Support Options  
S-1 Embedment  
S-2 Surface Plate  
S-3 Gull-Wing  
S-4 Sub-Floor

### Bench 38

- Front seat member tilted upward 3°

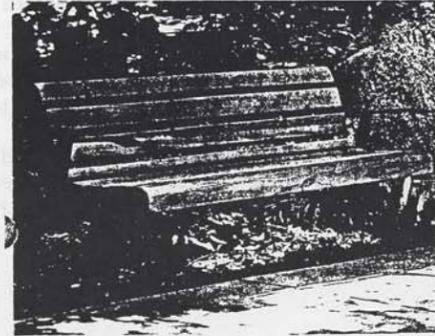
#### Materials

Slats: 3" x 8" and 3" x 4" nom. in choice of Clear All Heart, Free of Heart Center Redwood or Clear Douglas Fir with clear preservative.

Supports: 1/2" x 3" steel bar and 3" square x 1/4" wall steel tube.  
Fasteners: 3/8" diameter stainless steel screws.  
Finish: See inside front cover for choice of polyester powder finish. (Bronze shown.)

**Redwood Benches (2 supports)**  
38-60R 6' long, 235 lbs. \$456  
38-80R 8' long, 284 lbs. \$581

**Douglas Fir Benches (2 supports)**  
38-60D 6' long, 167 lbs. \$446  
38-80D 8' long, 245 lbs. \$544



### Glider Bench 30

- Utilizes 8 permanently lubricated bearings
- Nonmoving end frames give access to wheelchair users

#### Materials

Slats: 3" x 3" nom. in choice of Clear All Heart, Free of Heart Center Redwood or Clear Douglas Fir with clear preservative.

Frame: One-piece construction of 1/2" x 3" steel bar and 2-1/2" square x 1/4" wall steel tube.

Supports: 1/2" x 3" steel bar.  
Fasteners: Plated and stainless steel.  
Finish: See inside front cover for choice of polyester powder finish. (Bronze shown.)

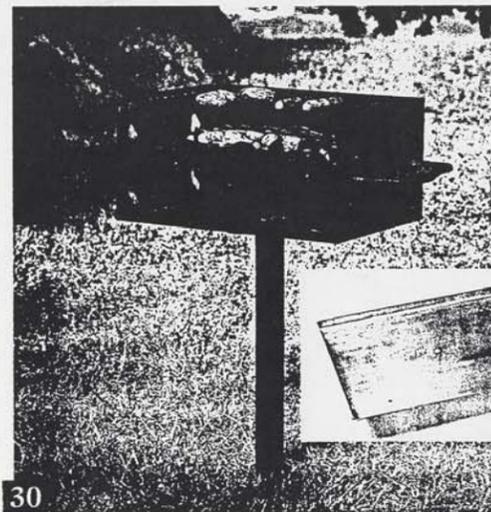
**Redwood Benches**  
30-60R 6' long, 282 lbs. \$711  
30-80R 8' long, 340 lbs. \$809

**Douglas Fir Benches**  
30-60D 6' long, 282 lbs. \$643  
30-80D 8' long, 340 lbs. \$759



3

Examples from: DuMor, Inc. Site Furnishings, 1996 Catalog, 1-800-598-4018. Local Rep: Outdoor Recreation Products, 1-800-747-5437. Other manufacturers have similar products available.



30

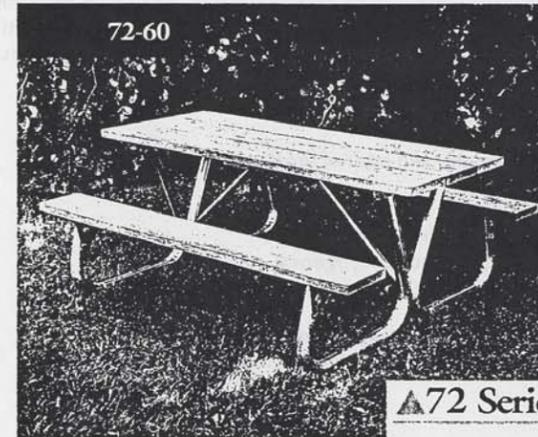
### Grill 27

- Optional stainless steel charcoal pan
- 280 square-inch cooking surface

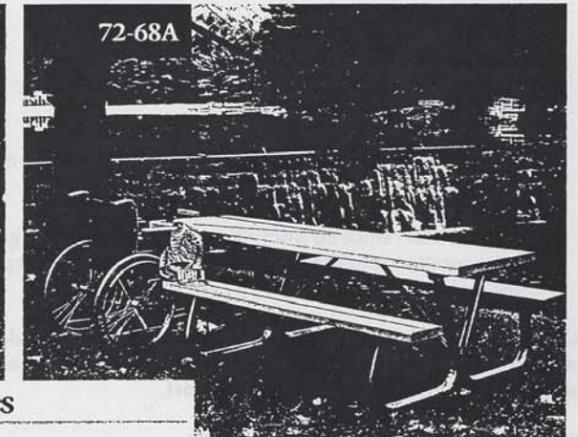
#### Materials

Wrapper and Bottom: 3/16" steel plate.  
Cooking Surface: 1/2" diameter steel bar.  
Charcoal Tray: 10 gauge steel.  
Handles: 5/8" diameter steel bars, coiled steel grips.  
Support Post: 2-3/8" O.D. steel pipe.  
Finish: Heat-resistant black enamel.

27-00 For embedment, 90 lbs. \$127  
27-00SS For embedment with SS pan, 85 lbs. \$152  
27-00-10SS SS pan with attaching hardware, 8 lbs. \$52



72-60



72-68A

### 72 Series

- 2" x 10" nom. top and seats—See Chart for sizes and material
- 2-3/8" O.D. galvanized steel pipe frames
- 1-5/16" O.D. galvanized steel pipe braces
- Special frames for recycled plastic
- Available for wheelchair users

6' DOUGLAS FIR	Model	72-60D
	Price	\$339
	Weight	235#
8' DOUGLAS FIR	Model	72-80D
	Price	\$394
	Weight	282#
WHEELCHAIR, DOUGLAS FIR	Model	72-68-1D
	Price	\$385
	Weight	282#

### Receptacle 44

- Fully assembled at factory
- Two 7" x 10" openings
- Also available with recycled plastic (see page 24)

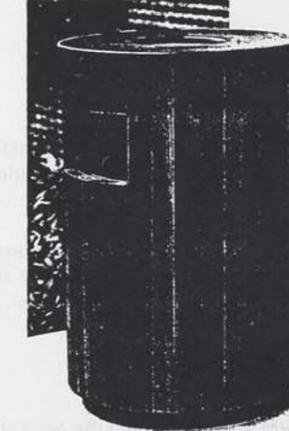
#### Materials

Slats: 1-1/2" thick in choice of Clear All Heart, Free of Heart Center Redwood or Clear Douglas Fir with clear preservative.

Frame: 3/16" steel.  
Liner: 22-gallon plastic.  
Top: Polyethylene with vinyl-coated cable and sand urn.  
Finish: Black polyester powder coat.  
Size: 25-1/2" diameter x 37-5/8" high.

**Redwood Receptacle**  
44-00R 110 lbs. \$491

**Douglas Fir Receptacle**  
44-00D 110 lbs. \$477



<u>Author</u>	<u>Title</u>	<u>Publication</u>	<u>Other Information</u>
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	Trails for the Twenty-First Century	Rails-to-Trails Conservancy, Ryan, Karen-Lee (Ed.)

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