

Lama 2014 Compost Toilet Options

system name	brief description	cost in labor-creation	cost in labor to maintain	financial cost to create	financial cost to maintain	duration of system	benefits of system	drawbacks of system	Other notes	Recommendation
Fossa Alterna	Portable toilet house that alternates between two hand-dug holes. When one hole is full, the house is moved and the compost ages while the second hole fills	30-100 people hours, depending on whether purchased or gleaned materials are used	Toilet house must be moved every time it fills (2 people fill it in 1-3 years) costing 4-10 people hours. Other maintenace depending on kind of structure	\$0-200 per toilet depending on materials chosen	negligible	Depending on materials, as long as the outhouse houses last--up to 20 years	High educational value. Students could build during retreat. No plastic required.	rodents and insects have access to material. Material has to be moved to be used	Used throughout the world	Recommended for guest housing and at the edge of the campsites. Could be seva workshop.
Arboloo	Portable toilet house that is moved once the hole is filled. A tree is planted in the hole	30-100 people hours, depending on whether purchased or gleaned materials are used	Toilet house must be moved every time it fills (2 people fill it in 1-2 years) costing 4-10 people hours. Other maintenace depending on kind of structure	\$0-200 per toilet depending on materials chosen. Can serve about 6 users through 4 months of summer.	cost to purchase trees	Depending on materials, as long as the outhouse houses last--up to 20 years	High educational value. Material doesn't have to be moved to be used. No plastic required.	rodents and insects have access to material. Material has to be moved to be used	Used throughout the world	Recommended for guest housing and at the edge of the campsites. Could be seva workshop.
Solar Digester	Toilet house over a solar heated basement. Humanure is colcted and composted in 55-gal drums/garbage bins. Lama has one but it wasn't quite built correctly so doesn't work optimally	150-300 people hours, depending on skill and efficiency of builders and materials used and quality of toilet house.	Drums/bins must be shifted as they fill. This summer they have been shifted every week or two. If fewer people use the system might be shifted less often.	\$300-600 for materials, depending on quality of toilet house. Can serve about 4 people year round. \$150 to fix current one.	Negligible. Every ten years or more new bins required. To expand system in summer \$150 in bins would mean that 20 more people could be accomodated.	Current system is 15 years old. Indefinite lifespan	High educational value. If built and maintained correctly solar gain can speed up composting considerably	Maintennance and construction require a higher level of understanding, better training and more precision than some other systems.	Milkwood Australian system similar but just moves bins out to a parking lot, and lets material compost without aid of solar digester	Repair current system and then see how well it works. Use may be restricted. Could be seva workshop.
Double Chamber	Toilet house over concrete basement that is divided into two (or more) large compartments. Material goes directly into the basement from the toilet. When one chamber is full the other rests, and is	200-600 people hours, depending on skill and efficiency of builders and materials used and quality of toilet house.	Empty system every few years	\$500-1500 (assuming some volunteer labor) for the composter below, depending on size. Housing above can cost \$500-20,000 depending on preferences.	negligible	Probably many decades. Indefinite.	Simple system with no moving parts, and slow to fil upl. Water table protected by concrete floor. Fairly well known, popular system. Kitchen compost may be added. No plastic required.	Construction requires skill in concrete masonry. Flies, gnats and odors may be similar to an outhouse. For optimal function, some additional	Sirius Community in Mass. reports they got a permit for theirs. Twin Oaks Community built one and is pleased with it but estimate that only about 15 people use it.	Recommended for use as a central system, but probably restricted to summer use. Could be built as seva workshop.
Phoenix	Commercial system that collects material in a basement below the toilets, in a plastic bin with many layers built into it.	Negligible, if the company installs, less than 30 people hours if we install. (Toilet house above supplied by Lama)	Every week move some levers, add some cover material and some water. Empty material no more than once a year	\$6100 per 90 people/pooping months. If it were used exclusively, Lama would need 3-4, assuming 2013-14 population levels. Requires a basement or two story building heated to 60F+ or more, which would cost \$8-25,000 if constructed new.	negligible.	20+ years. Warranty stil to be clarified. Has some moving parts necessary to its basic design	15+ year track record, with excellent reviews in trade journals. Company available to answer questions from new residents if Lama maintenannce transmission is lost. State of New Mexico inspector may be favorably impressed	May have gnats. For optimal function, some additional heat in the basement required	In use at the Grand Canyon, Yosemite, and Missouri State Parks (for 15 years), as well as in Grants, New Mexico at the Indian pueblo, Acoma.	Recommended for use as a central system.

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Clivus Multrum	Commercial system that collects material in a basement below the toilets, in a plastic bin with a slopes built into it.	Negligible, if the company installs, less than 30 people hours if we install. (Toilet house above supplied by Lama)	Every week rake and water the material. Empty material no more than once a year	\$9500 would serve 80 visits per day. it were used exclusively, Lama would need 2, assuming 2013-14 population levels. Requires a 7' basement or two story building heated to 64F+, so housing would cost \$8-25,000 if constructed new.	For \$250 can have someone come visit to inspect the system	20+ years. Warranty still to be clarified.	35 year track record. Company available to answer questions from new residents if Lama maintenance transmission is lost. State of New Mexico inspector may be favorably impressed	Gnats or flies may come up through toilet. Some odors. For optimal function, some additional heat in the basement required.	In use at Bronx Zoo. Also in use at Arapahoe Ski Basin, at 13,000 feet. Ski Basin has automatic misters and uses red wriggler worms, and leachate goes directly to a field. Iron Knot Ranch at 5000+ feet has used this system for 15 years. Pleased with system, but there are odors and flies and gnats in some seasons	Recommended for use as a central system.
Full Circle	Commercial system that collects material in a basement below the toilets, in plastic bins with suction hoses and vents built in	Negligible, if the company installs, less than 30 people hours if we install. (Toilet house above supplied by Lama)	Move bins as they fill (probably about once a week in peak summer months). Bins are on wheels. Water material.	\$10,200 was their estimate to serve the entire community, as the exclusive system. Could be downsized to serve half, for a about half the price. Requires a 5' basement heated to 55F, so housing would cost \$8-25,000 if constructed new.	May require some repairs, using materials available locally.	With some repairs, indefinitely. Has some moving parts, but they are not specific to the system	Young company. Founders also work for Phoenix. They claim theirs is the only system without gnats, and has the least odor (none). Kitchen compost may be added. Founders may make us a discount, may be excited enough to come out here to help install.	Company is new. For optimal function, some additional heat in the basement required.	In use in residences in Vermont. Once we understood their system, it seems logical that it is the least likely to have gnats and flies. Owners said they may be able to help us piece together the system here to save money.	Recommended for use as a central system.
Dew Drop 2 Do Drop	An alternative to building a new building--the basement can hold a commercial system	300 people hours	Same maintenance as any building	Up to \$5000 for heating system, \$2-4000 for other changes	Same as any building	Same as any building	Less expensive than other options, centrally located	Must find another place for storage below and internet use	Summer internet use could be moved to old Lamassary.	Recommended for use as part of a central system.
DYI Bucket & Trowel	People are given a trowel, and/or a bucket of "carbon" (cover material) and an empty bucket to collect urine and humanure. Collections are gathered at a central composting area (bin, trench or multiple bins)	10-20 hours to collect and distribute buckets; 15 hours each summer to construct bins	A few hours a week in summer to maintain bin.	\$0-12 per person, depending on whether everyone is given a toilet seat and whether buckets are obtained for free	negligible, unless purchased bins are used, in which case about \$8 per 60 people per day until enough buckets are bought.	Plastic buckets will last 2-15 years depending on care. Toilet seats may have to be replaced more often	Highest educational value of all systems. System expands and contracts based on size of group. Low embodied energy cost.	Unusual and requires people to learn and evolve quickly, possibly pushing them into an uncomfortable zone.	This is the system that most North American individuals and families (who want to compost humanure) are using.	Recommended for residents and stewards, as well as anyone sleeping more than a few hundred feet from an outhouse