

## **LooLoo. A Toilet for Living Rough.**

### **The Plan.**

The plan is to create a system of people, things and processes to improve the homeless living environment and community. The most salient feature is an innovative structure called LooLoo that collects human waste. But LooLoo is more than an outdoor toilet with solar power. It is an incentivized system of cooperation among homeless in an encampment and the surrounding community. It involves a local bank, sponsor, and volunteers. Read on to learn about this innovative approach.

YouTube Link.

<https://youtu.be/ylxO2FSPVPE>

### **Background.**

Many attempts were made in the past 10 years to design and build a public toilet. About 20 cities have public toilets. The most successful is the 2012 Portland public toilet called 'Portland Loo.' It costs about \$100,000 per unit to construct and install. Some estimates are as high as \$250,000 per toilet. Public toilets in San Francisco cost upwards of \$1,000,000 when you include design, construction, installation and maintenance.

The users for LooLoo are people living rough - homeless people. It is not a permanent public toilet. It is a temporary toilet for a specific user. Public toilets like the Portland Loo are designed for last 10 – 20 years. They're constructed of welded ¼ stainless steel panels with special powder coatings. LooLoo is designed to be a temporary consumable item, something that might last one season or a year at most. It's extremely low cost (less than \$800 for materials), low maintenance and simple construction for easy assembly and disassembly by two people is a huge advantage over expensive public toilets.

The following 'Lessons Learned' from the design of the Portland Loo and Porta Potty compared to LooLoo are identified in the following table. LooLoo exceeds the design characteristics of both the Portland Loo and popular Porta Potty.

*Table 1 - Comparison of Portland Loo, Porta Potty and LooLoo*

<b>Feature</b>	<b>Loo Loo</b>	<b>Portland Loo</b>	<b>Porta Potty</b>
<b>Only one person inside</b>	<b>Yes</b>	Yes	Yes
<b>No mirror</b>	<b>Yes</b>	Yes	Yes
<b>No running water inside</b>	<b>Yes</b>	Yes	Yes
<b>Visibility inside</b>	<b>Yes</b>	Yes	No
<b>No flush button</b>	<b>Yes</b>	Yes	Yes
<b>Graffiti resistant</b>	N/A	Yes	Yes
<b>Damage repairable</b>	<b>Yes</b>	Yes	Yes

<b>Hand sanitizer</b>	<b>Yes</b>	Yes	No
<b>Lighting</b>	<b>Yes</b>	Yes	No
<b>ADA compliant</b>	N/A	Yes	Yes
<b>Stainless steel</b>	No	Yes	No
<b>Charging station</b>	<b>Yes</b>	No	No
<b>UVGI</b>	<b>Yes</b>	No	No
<b>Four (4) season use</b>	<b>Yes</b>	No	Yes

### **Some Design Considerations to Optimize the Experience.**

The structure must appear interesting and encourage users to use. I believe LooLoo accomplishes that goal. The shape of the structure is important, also. LooLoo might be a trapezoidal structure or a cube with a lower ceiling of 6 feet rather than 8 feet. It is not a tall, square anonymous plastic box with a huge hinged door like you see at county fairs. Also, an effort is made to minimize the number of moving parts. Moving parts and interfaces break. Therefore, the door is envisioned as a ship's door without hinges. It slides on a track which captures the door so that it cannot be removed. It can only be slid in its track. It has no hardware. Door width is 24 inches.

The entire structure could be constructed using eight (8) sheets of 0.5-inch-thick pressure treated 4 feet x 8 feet plywood sheets. Each sheet weighs about 50 lbs. so the entire structure might weigh about 400 lbs. Each sheet costs about \$28 at Home Depot. Since it is constructed with splines and some fasteners, it is easy to assemble and disassemble. It does include a 'power cap' as designed for the HOME Shelter, its predecessor. Watch a video at: <http://www.thehomeshelter.org>.

Based on preliminary calculations, a hard, plastic, split 55-gallon drum can be used as a waste collector. On average, each person poops about once a day; each poop weighs about 1 pound. A local septic company would provide pumping. Renting a portapotty costs about \$200.00 per day. Pumping a portapotty costs about \$175.00. Therefore, assuming only 40 gallons of a split 55-gallon drum are filled with poop, then each LooLoo might be pumped once a week.

Volume estimates will help predict when a composting substance like yeast should be added to help reduce fumes and smell. However, the solar power feature allows for a low power ventilation system. Users and local community residents complain of the odor emanating from a toilet. The solution is two-fold: (1) composting with yeast, and (2) atomized deodorant. Callington Haven is the most widely used in-flight air freshener and deodorizer. Either a solid bar or spray bottle is available. The spray bottle might be activated when the door is opened / closed or when the seat lid is raised or lowered. There are many possible methods of dispersion.

### **The User Experience and Trompe l'oeil.**

Imagine, if you will, the exterior covered with ‘trompe l’oeil’ effect to make the structure ‘disappear’ from the environment. Imagine the exterior of the structure, when set against a wall, that it looks like the wall! There might be a ‘trompe l’oeil’ window where there is no window. Or a tree with shrubs and a sky if situated in a woods.

The trompe l’oeil effects may be painted or applied using a mask much like you see on the side of a bus. An art student might take photos or create a mural and digitize it onto a vinyl wrapping surface. The surface can be applied in a workshop or onsite. Hopefully, the additional visual component makes the structure less likely to be vandalized with graffiti.

**What No Other Toilet Has – A Charging Station.**

Like the HOME Shelter, LooLoo includes a low-cost electronic subsystem. The electronic subsystem will include a monocrystalline solar panel, wiring, charge controller, AGM battery, and inverter. Total output is estimated at 100 watts with operational efficiency at 2-3 amps on a cloudy day. A low wattage solar powered LED light is possible. The small roof mounted solar panel will discourage vandalized since it will be nearly inaccessible. Electronic subsystem wiring diagram, load analysis, etc., is described in the HOME Shelter literature which is available.

The following table identifies power cap electronic components and cost based on The HOME Shelter in 2014.

Item	Recommended	Description
Solar panel	Grape Solar GS-S-100-TS-100 watt	100-watt monocrystalline pv solar panel, 41 inches x 21 inches, 16.5 lbs. \$149.00.
Battery (2)	Universal Battery, Absorbed Glass Mat, 30 AH,	6 inches x 4 inches x 4 inches, 6 lbs. \$70.00.
Charge Controller	PMM Morningstar, PWM	10 amp, \$40.00.
Power Inverter	Samlex, pure sine wave	600 watt, \$150.00.
Miscellaneous	Connectors, wiring, plugs	\$50.00
	Total Estimated Cost	\$460.00

**Optimizing the User Experience with a Caretaker.**

To make LooLoo work, it requires a local person to maintain the facility – a caretaker. The caretaker is a member of the local homeless community. The caretaker is responsible for cleaning surfaces, replacing toilet paper, advising users, adding yeast, replacing sanitizer and encouraging usage. The consumables like spray disinfectant, yeast packages, sanitizer and bleach spray could be stored in the unit or with the caretaker.

The caretaker maintains the structure and its resources. The idea is to reimburse the caretaker using an Electronic Funds Transfer (EFT) via a cell phone. Research shows that most homeless have a cell phone. Cell phones are the homeless lifeline. The EFT can be redeemed for cash

later to maintain community involvement. Using an EFT application and a bank account enables the caretaker to establish some financial stability. Caretakers might be rotated on a monthly basis. Funds can be transferred via a bank manager social worker to the caretaker on a timely basis.

**Some Interior Design Features.**

As we know, all men are pigs. My medical oncologist, Dr. Tina Rizack, told me so. I had bladder cancer. If we can design LooLoo to strongly encourage men to sit down to pee, then there is less spillage and cleanup.

One interior design feature is to place a usable obstacle directly in front of the seat. This structure has two functions: prevent standing and serve as a charging station for cell phones. Cell phones need charging. Why not charge and dump at the same time? Ruggedized cables and connectors enable cell phone charging while using LooLoo. After 6 surgeries for bladder cancer, 120 hours of Cisplatin chemotherapy and 7 weeks of radiation therapy, I can tell you it's a lot easier to pee sitting down than standing up.

One idea for inspiring change is to include some messages via adhesive stickers on the interior walls. Messages are not condescending or pedantic. One sticker might be: 'Get in, sit down and charge'. Another sticker message might be: 'Call a friend'. Or 'How are you feeling?'

**Some Estimated Cost Items.**

<b>Item</b>	<b>One Time vs Recurring</b>	<b>Estimated Cost</b>
Structure	One time	\$800.00
Electronics	One time	\$450.00
Caretaker (\$20 / day, one week)	Recurring	\$140.00
Pumping (once / week)	Recurring	\$175.00
Social worker, bank account, etc. / week	Recurring	\$100.00