

# REDOING THE LOO: AN ECOLOGICAL AND ECONOMIC ANALYSIS OF ALTERNATIVE TOILET DESIGNS

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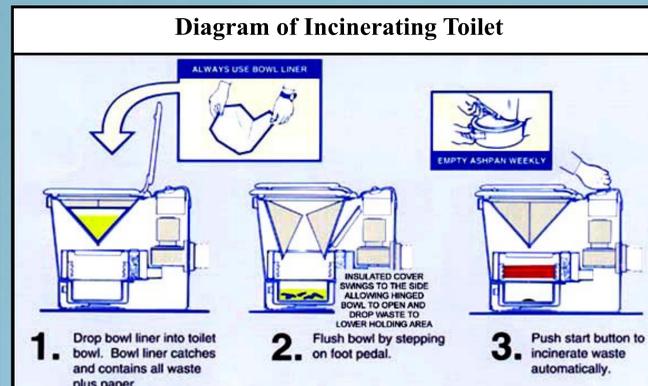
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## Abstract

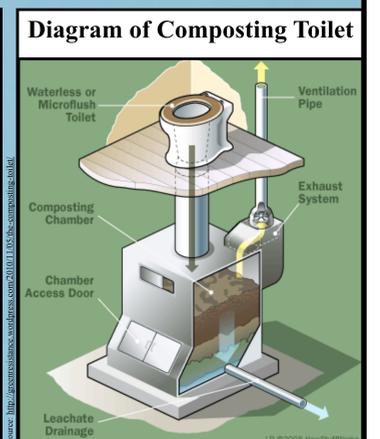
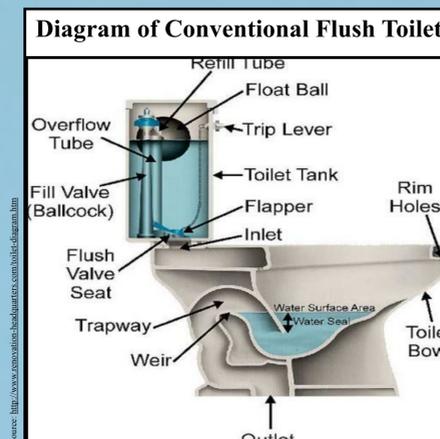
The conventional flush toilet is the developed world's default method of human excreta removal. Despite its prevalence, ecologists maintain that this appliance is becoming one of the most wasteful household instruments. It uses excessive amounts of potable water, requires energy-intensive treatment technology, and creates a considerable amount of pollution. In this thesis, I intend to explore and analyze alternative toilet designs including the ultra low flush, the incinerating toilet, and the composting toilet. I aim to assess each technology in terms of ecological soundness and economic viability, within the context of a residential setting in the United States. In order to evaluate each technology's merits and disadvantages, I examine criteria including water usage, energy usage, cost of installation, cost of operation, and cost of maintenance. My investigation serves as an informative guideline for current and future homeowners seeking an alternative to the conventional flush toilet.

## Methods

I began the investigation by conducting a literature review of scholarly journals, books, articles, and websites. My intention was to gain an in-depth understanding of the history, politics, economics, and environmental impacts of the conventional flush toilet. Once I had completed the background research, I began to review literature related to alternative toilet systems. After discovering that there are numerous existing designs, I decided to focus my research on three distinct toilet types: the ultra low flush toilet, the incinerating toilet, and the composting toilet. To assess the ecological soundness and economic viability of each technology, I consulted owner's manuals, producer's websites, and owner's blogs. Additionally, I interviewed alternative toilet producers and owners to obtain first-hand information. I concluded the investigation by synthesizing my findings and deciding which of the three technologies was the most ecological and economical based on the predetermined criteria.



Alternative Toilet System	Ecological Advantages	Ecological Drawbacks	Economic Advantages	Economic Drawbacks
<b>Ultra Low Flush Toilet</b>	-Reduces toilet water use by 54%-74%	-Requires wastewater treatment	-Relatively cheap (\$100-\$900)	-Requires regular maintenance
<b>Incinerating Toilet</b>	-Completely waterless -Converts excreta to sterile ash	-Requires large amount of energy	-Eliminates cost of toilet flushing water	-Very expensive (\$1499-\$2,200) -Requires regular maintenance
<b>Composting Toilet</b>	-Requires little to no water -Converts excreta to usable humus -Accepts organic kitchen wastes	-Requires electricity -Insufficiently composted humus pollutes ecosystems	-Reduces or eliminates cost of toilet flushing water	-Very expensive (\$1,200-\$6,000) -Requires regular maintenance



## Conclusion

My findings revealed that each of the three alternative toilet designs has benefits and drawbacks. The first technology, the ultra low flush toilet, offers ecological and economic advantages including water- use reduction and low-cost maintenance and installment. Despite these benefits, the ultra low flush technology perpetuates environmental and economic issues associated with wastewater treatment. The second technology, the incinerating toilet, is a completely waterless design that bypasses all environmental and economic problems related to sewage and sewer infrastructure. Unfortunately, the incinerating toilet is exceptionally expensive and incredibly energy-intensive. The final technology, the composting toilet, is nearly waterless, costs less than the incinerating design, and eliminates the need for transportation and treatment of wastewater. Regrettably, composting toilets also require moderately expensive installment and maintenance. Although each of these three alternative toilet systems has redeeming features and shortcomings, I conclude that the composting toilet is the most ecologically sound and economically viable. I can confidently make this deduction because the demerits of the composting toilet are comparatively minor and many toilet innovators are focusing their efforts on this particular design.