

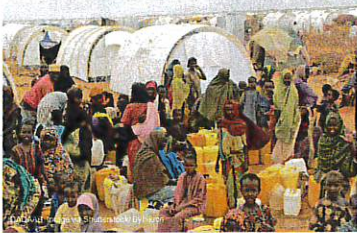



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*Society at Crisis: HOUSING* LifeArk

- **1.6 billion** people live in floating slums or substandard housing globally and **100 million** are homeless<sup>1</sup>
- **82.4 million** people worldwide have been forcibly displaced as of 2020 as a result of persecution, conflict, violence, human rights violations<sup>2</sup>
- Displaced persons spend more than **16 years** living as refugees in temporary shelters<sup>3</sup>







<sup>1</sup> <https://reimagine.worldcup.org/homeless-statistics/>  
<sup>2</sup> <https://www.unhcr.org/statistics/>  
<sup>3</sup> [https://www.unhcr.org/7/4a/madum-website&fb\\_source=share\\_button](https://www.unhcr.org/7/4a/madum-website&fb_source=share_button)



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## Climate Change Will Magnify Housing Crisis

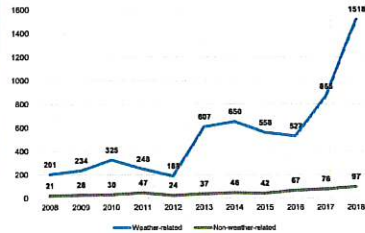


- IPCC released a report on climate change that United Nation called a “**code red for humanity**”<sup>1</sup>
- By 2030, earth might have **only 10%** of its forests which will accelerate global warming<sup>2</sup>
- Extreme weather events resulted in **15,000 deaths** and economic loss of **\$170 billion** in 2020<sup>3</sup>
- Every **2 seconds**, climate change is forcing someone from their homes<sup>4</sup>



**Figure 1: Number of climate-related disasters per year that have resulted in people being internally displaced**



Year	Weather-related	Non-weather-related
2008	21	20
2009	28	20
2010	35	20
2011	47	20
2012	24	20
2013	37	20
2014	48	20
2015	42	20
2016	67	20
2017	78	20
2018	1518	20

Source: Oxfam analysis of data from the Internal Displacement Monitoring Centre.\*

<sup>1</sup> <https://www.ipcc.ch/2022/08/15/summary-for-policymakers-of-the-ipcc-working-group-i-report/>


<sup>2</sup> <https://earth.org/the-biggest-environmental-problems-of-our-lifetime/>

<sup>3</sup> <https://www.oxfam.org/en/news/2021/04/20/oxfam-2020-climate-disasters>



<sup>4</sup> <https://cleantechica.com/2020/03/01/oxfam-every-2-seconds-climate-change-forces-a-person-from-their-home/>

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## Our Planet is Drowning in Plastic Trash



- Our society has become addicted to **single-use** or **disposable plastic**
- **300 million tons** of plastic waste is produced **every year** - equivalent to the weight of the entire human population<sup>1</sup>
- **Only 9%** of plastic waste is **recycled** - 12% is incinerated and **79%** end up in **landfills** or **natural environment**<sup>1</sup> where they stay for **centuries**
- Plastic is an **inexpensive, hygienic, and extremely durable** material
- It's **time to rethink** of plastic not as a disposable material but as a long-lasting solution for another global problem - the **housing crisis**

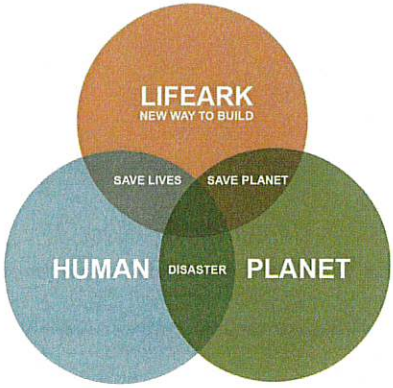
<sup>1</sup> <https://www.oxfam.org/en/news/2021/04/20/oxfam-2020-climate-disasters>

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*LifeArk is at the Intersection of These Crises* LifeArk

To help solve these crises *Reimagine Housing* that can...





- Float on water or be constructed on land
- Use recycled plastic as raw material
- Withstand extreme disasters, such as earthquakes and flooding
- Be mass produced quickly and easily transported
- Use simple tools to assemble and disassemble
- Be built on or off-grid with integrated solar, wind and sanitation systems
- Have design flexibility like Lego to build one house or a master community
- Minimize maintenance costs while lasting over 50 years

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*LifeArk is a Radical Rethinking of Housing* LifeArk

“LifeArk is a physical solution to vulnerable human living conditions caused by climate change, natural disasters, armed conflict, and economic disparity through a pre-fabricated, modular building system that can create self-sustaining aquatic or terrestrial communities.”

- **Buckminster Fuller Institute**  
Semi-Finalist For 2017 Fuller Challenge

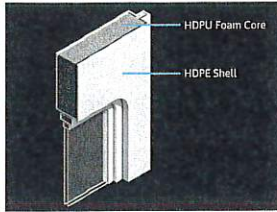



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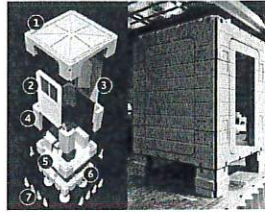
*Innovation in Materials, Design & Manufacturing* 

LifeArk innovations create a viable alternative to conventional construction



**MATERIALS**

- HDPE/PU foam panel for maximum strength, thermal and sound resistance
- Pioneering use of plastic as load-bearing material in construction
- 30% of raw material can be recycled plastic (PCR)



**DESIGN**

- Kit-of-parts with Lego-like simplicity allows easy assembly and transportation
- Application of nautical engineering for complex structural criteria



**MANUFACTURING**

- Rotomolding makes mass production possible at low capital investment
- Common plastic processing technology but never used for housing construction
- Easily scalable for mass production

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*LifeArk El Monte Permanent Supportive Housing* 

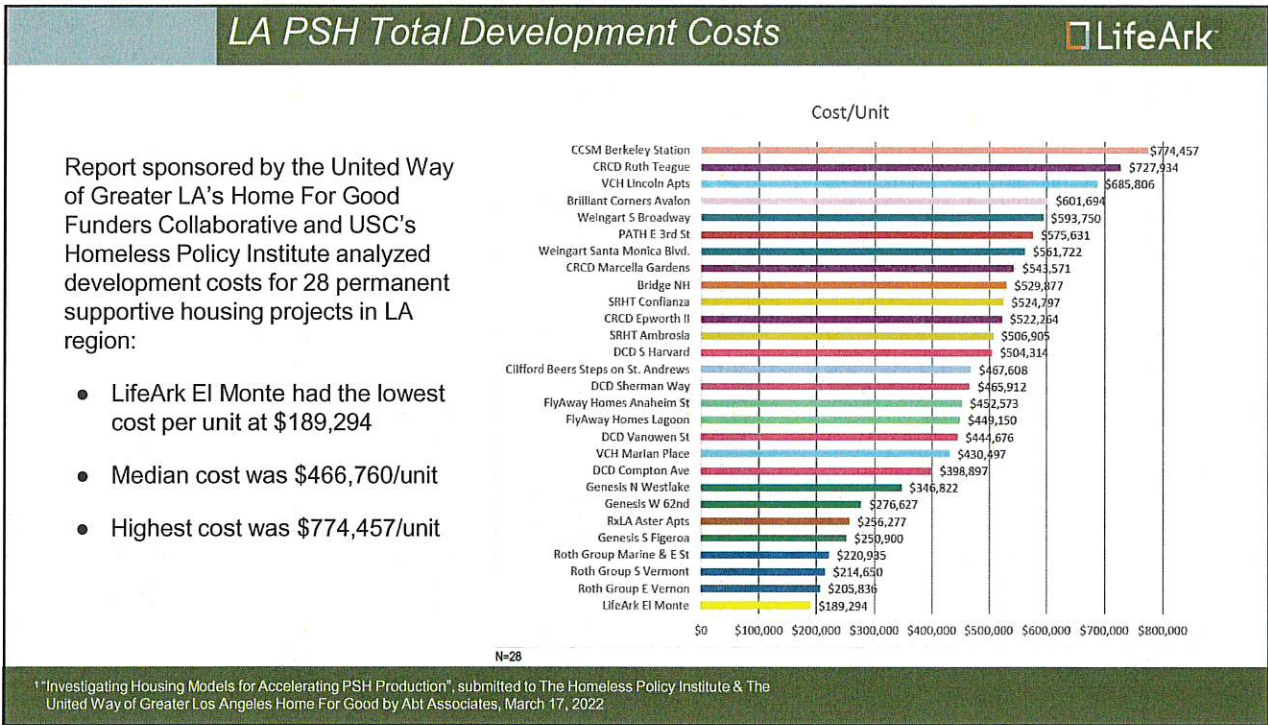
**LA County Housing Innovation Challenge award-winning project**

- 18 units for homeless + mgr's unit
- Low density = No NIMBY
- 14,805 SF lot size
- \$3.6 million total project cost
- \$189k per unit
- Designed to foster creation of community that can help alleviate social isolation



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## LifeArk is HCD-Approved for Use as Shelter LifeArk



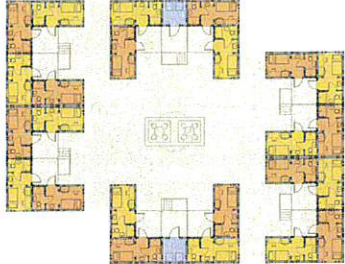
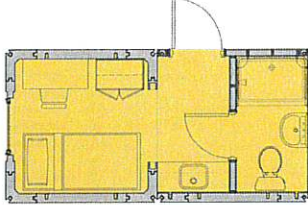
- Single 8x8 module can be used as a shelter
- Each unit can be assembled within an hour
- Easily disassembled and relocated
- Simple foundation system allows for use on dirt or parking lot
- Can be equipped with fire sprinkler and HVAC
- Flexibility to configure on odd-shaped lots

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*LifeArk's Durability Allows for Use as Interim Housing* 

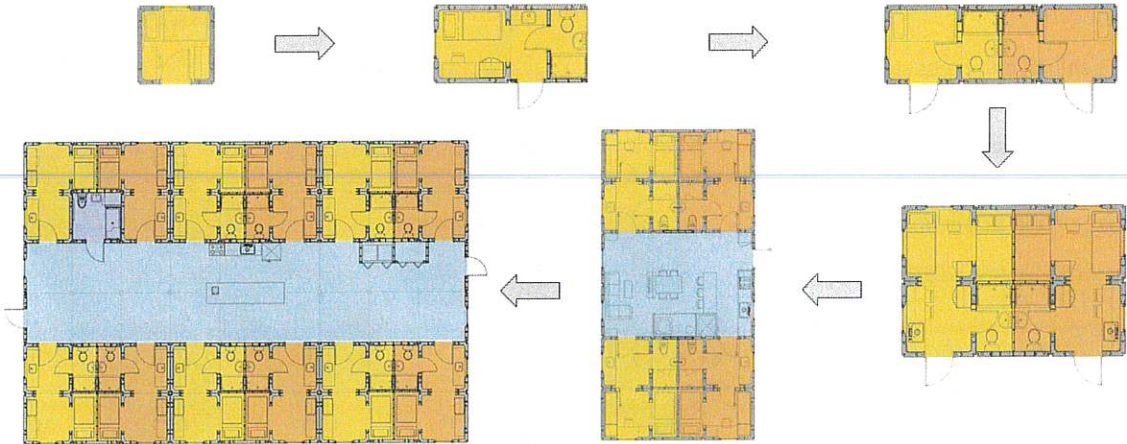
- Two 8x8 modules can be used as interim housing for longer stays
- Each unit has bathroom and kitchenette
- Integrated fire sprinkler and HVAC
- Can be designed for individuals or families of varying sizes
- Units can be clustered into multiple configurations with a courtyard community area



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*Shelter Module Can Progress to Permanent Housing* 

By adding additional modules, LifeArk can incrementally progress from single-module **shelter** to **interim housing** to **permanent housing**



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## Cost-Effective & Durable Shelter Solution LifeArk

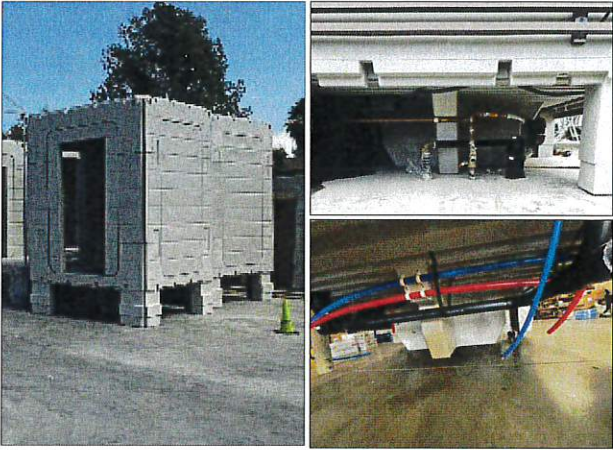
### LA Tiny Home Cost Comparison

Category	Tiny Home AVG	LifeArk
Pre-Planning	\$11,739 (12%)	\$8,694 (14%)
Modules/Fixtures	\$12,669 (13%)	\$25,042 (40%)
Site Work	\$69,717 (74%)	\$28,542 (46%)
<b>Total</b>	<b>\$94,126/unit</b>	<b>\$62,278/unit</b>

**Tiny Home AVG**      **LifeArk**

■ Pre-Planning   ■ Modules/Fixtures   ■ Site Work

High under module crawl space allows for all utilities to run above the ground to minimize expensive trenching and in-ground site work



<sup>1</sup> <https://amarfoundation.org/tiny-home-villages/> - per unit cost calculated assuming single occupancy per unit

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## LA City Interim Housing Project LifeArk

Site Area: 16,340 SF

- Lot 1: 10,065 SF
- Lot 2: 6,275 SF
- Existing City Parking Lot



1. Ensuite Units
2. ADA Units
3. Admin/Flex
4. Laundry Unit
5. Parking
6. Trash
7. Dog Run
8. Storage
9. Covered Central Courtyard
10. Entry
11. Easement

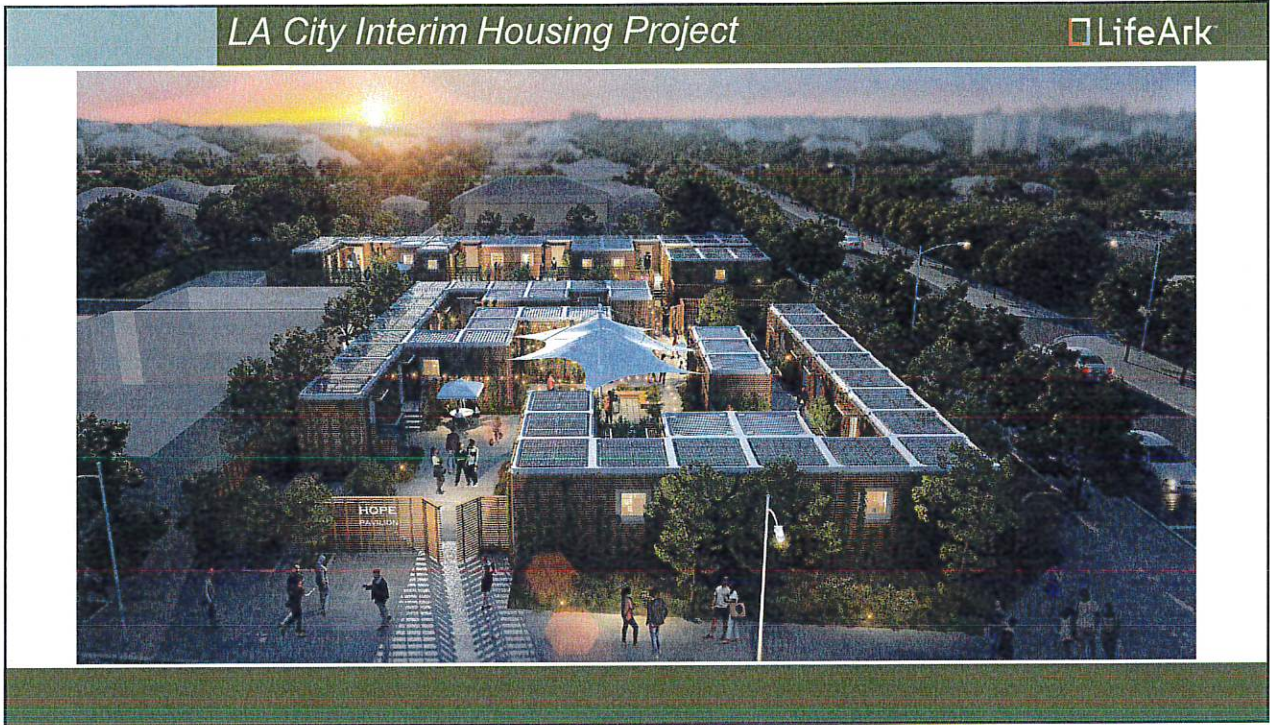


• 33 Ensuite Units

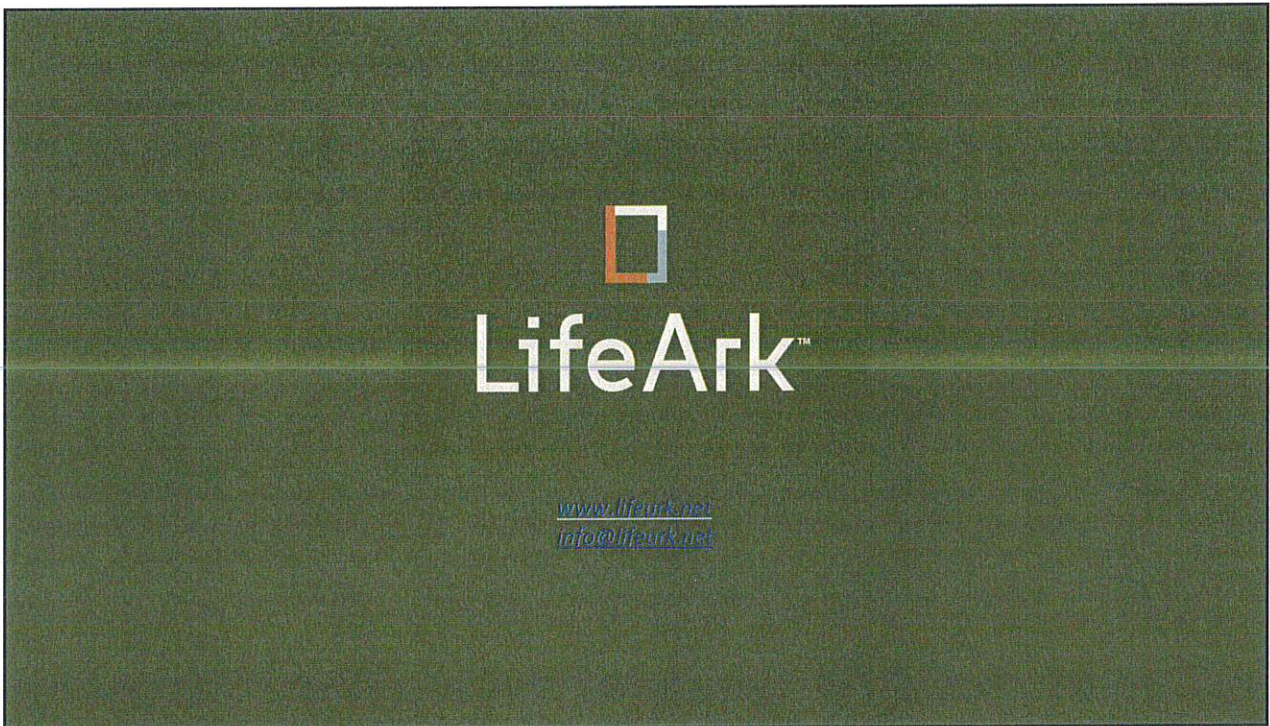


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