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# Addendum 1.01



## Open Source Land & Decentralized On-Demand Transit

A Community-Defined Framework for Hackable Housing & Hybrid Public-Private Transportation

July 24, 2017

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## Overview

**"You have to give people a vision, a goal, something attainable, as a first stepping stone." Homeless Willie, 19 years homeless in Silicon Valley.**

We respectfully include this addendum with additional details about our proposal for Open Source Land (OSL) with access to Decentralized, On-Demand Transit. The intent is to provide additional operating and cost details, in addition to other policy ideas that we hope you find helpful and thought-provoking.

By far, the most urgent and consequential aspect of implementing OSL is the potential market-stabilizing effect of providing a sustainable, resource-based, universally accessible, entry-level pricing benchmark for shelter in any city, county, or region. The unsustainability of current housing market mechanics is brutally undeniable, as illustrated in personal profiles every single day in the news, on social media, and of course on the streets we traverse each day.

Local housing markets seem somewhat like a number line without a zero end point. If a number system has no concept of zero, it surely becomes significantly distorted, and certainly far less versatile, adaptable to solving practical problems. Worse than that, in the housing market, each year the tail of our number line is chopped off yet again, so there's no one, then no two, and so forth, as all attention is fixed upon the feverish pursuit of infinity at the other end of the line.

This is, albeit in a roundabout manner, an attempt to get somewhat closer to the root of the problem in housing. The root of a maniacal, frenetic fervor toward infinite exponential growth, for infinite exponential growth's sake. And perhaps nowhere is this root more deeply established than in Silicon Valley. Yet, we seem to persistently conflate causes and effects.

## Symptoms and Causes of the Housing Crisis

In the July 24, 2017 edition of The Guardian we read,

Mark Zuckerberg's travels throughout the United States to fulfill his 2017 "personal challenge" to "learn about people's hopes and challenges" have seen him drive a tractor, meet recovering heroin addicts, don a hard hat and speak out against the staggering wealth inequality that his \$68.5bn fortune so clearly represents.

But to Nicole, a worker in one of Facebook's cafeterias, they have also raised an important question: "Is he going to come here?"

"Here" is just a few miles from Zuckerberg's five-house compound in Palo Alto and mere blocks from Facebook's sprawling Menlo Park headquarters. Here, on a quiet street of modest bungalows, Nicole and her husband Victor, who also works at a Facebook cafeteria, live in a two-car garage with their children, aged nine, eight and four.

"He doesn't have to go around the world," said Nicole. "He should learn what's happening in this city."<sup>1</sup>

Lives like Nicole's aren't just stories, they are real lives. Lives like Nicole's also are not "the problem," much less, the root of the problem. The plight of Silicon Valley families like Nicole's are symptoms, not the cause of an utterly unsustainable housing market model. The cause is something much more fundamental, programmatically designed into the housing market environment, itself. Open Source Land aspires to address the bugs in this code, directly. To restore a grounded number line that begins at zero, by creating a sustainable, resource-based, universally accessible, entry-level standard for shelter in the twenty-first century urban megacity context.

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<sup>1</sup><https://www.theguardian.com/technology/2017/jul/24/facebook-cafeteria-workers-wages-zuckerberg-challenges> Accessed 24 July 2017.

## Additional Operating Cost Details for Open Source Land

OSL facilities can be organized any number of ways, including, but not limited to: public, private non profit, private Public Benefit Corporation (PBC), or joint public-private ventures. Any of these can be funded by a flexible donation model designed to both comfortably cover all costs of administration and maintenance while offering a stabilizing low-end market benchmark for shelter in a city, county, or region.

It is equally important to develop transparent guidelines in establishing OSL Donation Rates, so that every member of the Open Source Land community member can know exactly why rates are as they are, conveying the foundational ethical value of fairness in shelter options, through the price signal. To achieve this, we first derive a local market average for the Utilities Components of a two-occupant RV, then assess a reasonable markup (M%) as a margin to comfortably cover suitable maintenance and administration costs, finally adding the cost of Land Use<sup>2</sup>.

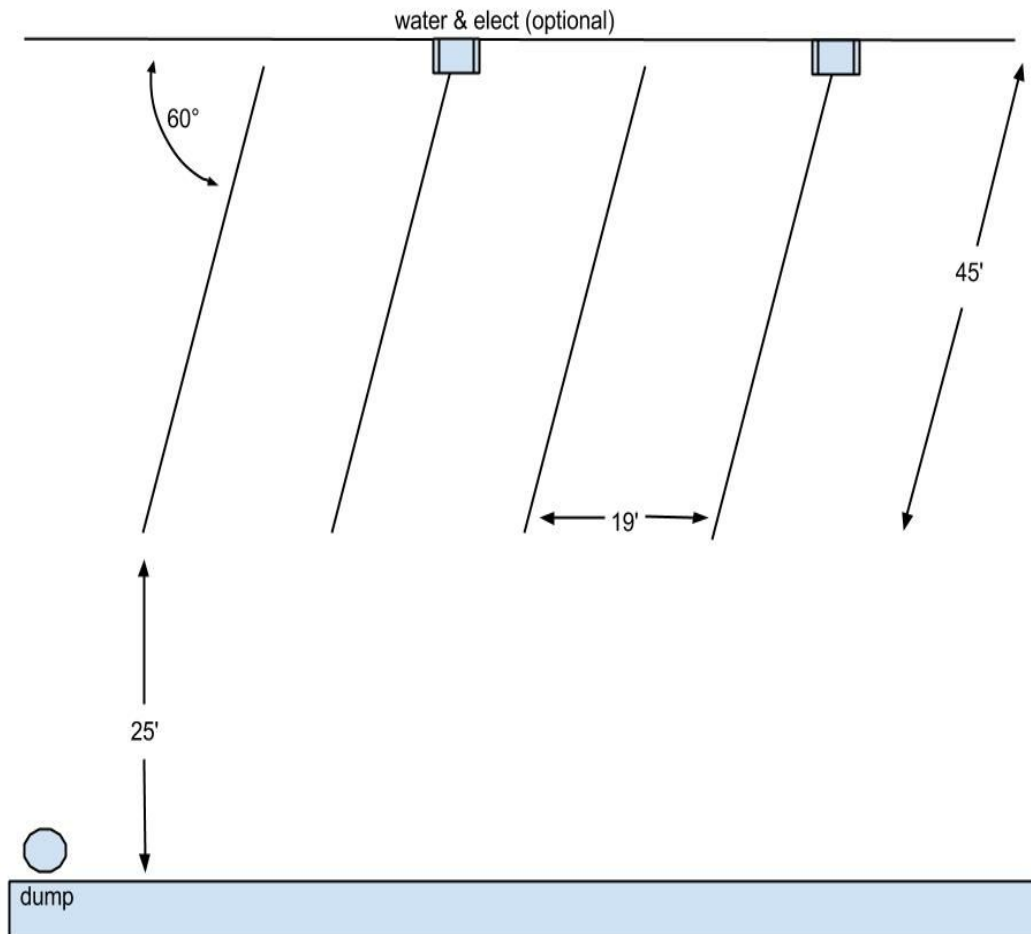
Further detail and examples of this model are provided, below. We'll further clarify terminology in the course of describing the model, below.

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<sup>2</sup> We derive the Land Use benchmark from the existing proven model currently in operation by the Elks. In the case of Sunnyvale, the 2017 Storage Rate for an RV is \$3/day.

## Basic Land Use Layout

For the purposes of this model, we utilize a OSL Single Use Space of 19'x 45', or 855 sf each, with 25' wide driveways for ingress and egress, as illustrated below. Each space is designed to accommodate an RV, but can also be utilized for other forms of safe, temporary shelter.



## OSL Unit Costs

For the purposes of this addendum, we will use a single RV, two-occupant scenario in order to derive unit operating costs. We will utilize these costs to then suggest an OSL Donation Rate model, which represents the price that community participants will incur to shelter at OSL sites.

To begin, a reasonable first question to ask is what minimum, average, and maximum resource demands (land, electricity, water) are created by an RV or similar mobile/portable shelter? To address this question, we again turn to the already proven model, utilized by full-time RVers for decades.

### *Electricity Consumption*

This is an area of tremendous opportunity, both for cost efficiency and environmental sustainability. If the electricity demands of OSL facilities are met by solar and renewables, then the cost of providing that electricity drops precipitously, to the initial fixed cost of installation, plus periodic maintenance & replacements. While the cost of initial installation of such a system is not covered in this addendum, we are happy to work on that, upon request.

We begin here by providing reasonable industry standard estimates of how much electricity an average RV (up to 20 years old), is able to consume. It is important to note that, unlike fixed housing, RVs have a built-in limit to how much they can use, in the form of 30 Amp or 50 Amp lines. This makes RVs an extremely ecologically responsible way to shelter. For the purposes of this addendum, we use the 30 Amp model, which is especially more common among older RV's.

With these thoughts in mind, below is a table of common appliances and approximate electricity demands in the RV housing category.

Appliance	Energy Usage (amps)
Coffee maker	8.3
Microwave	9 to 13
Refrigerator	2 to 4
Air conditioning	13 to 15
TV	2
Hair dryer	9 to 12
Toaster oven	8 to 10
Electric skillet	6 to 12
Electric car	8 to 12

While many people living in fixed housing may be quite oblivious to how much electricity and water they use, RV dwellers are keenly aware of these scarce resources. This level of applied resource usage awareness in everyday living should be celebrated and encouraged, not disparaged, much less criminalized, by cities, counties, and states.

As mentioned above, regardless of the number of appliances one might utilize in an RV, RVs have a built-in limit to how much they can draw from the utility pedestal. In the case of a standard 30 Amp shore line (nickname for the electrical connection to a utility pedestal), even if an RV ran all of its appliances 24 hours a day (which is almost impossible to do, if you tried) it could only consume a fixed amount of electricity per day. We can calculate that cost directly, as follows:



30 amps \* 24 hours = 720 amp-hours (AH) per day

Convert AH to kWh:

kWh = (Amp hours \* Voltage) / 1,000

Calculate daily cost:

Max cost = kWh \* Energy rate

To accomplish this, we look up the local utility rates and determine exact maximum usage cost per OSL Single Use Space. In the case of Sunnyvale, the current 2017 PGE Average Total Rate<sup>3</sup> per kWh is \$0.23073/kWh. Using these figures, the most electricity that an “energy hog” RV could possibly use in a single day can be calculated as:

$$(720\text{AH} * 110\text{v}) / 1,000\text{W} = 79.2\text{kWh}$$

$$79.2\text{kWh} * \$0.23073/\text{kWh} = \$18.27/\text{day}$$

This is the maximum possible energy cost of an OSL Single Use Space, regardless of number of occupants, if and only if pulling the full capacity of the circuit at all times. This extreme case is virtually never experienced. A more average energy use figure is much closer to just over half that amount, as people use little or no electricity while sleeping for 8 to 10 hours a night. Using 60% as an example, that brings the estimated daily electricity use figure to \$10.96/day. So we can use \$11/day as a reasonable unit cost per OSL Single Use Space.

### *Water Consumption*

An RV fresh water holding tank can hold anywhere from 20 to 100 gallons of water, on average. In our experience, 60 to 80 gallons is not an unreasonable ballpark average. Most RVers know how to stretch this amount of water to an extreme degree – a couple can make 80 gallons last an entire week, or longer, showers and all — that should make most fixed home dwellers

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<sup>3</sup> Source: ResElecCurrent.pdf from <https://www.pge.com/tariffs/index.page> Accessed 21 July 2017.

ashamed of the massive waste that they take for granted, in a world where water is becoming an increasingly hot geopolitical and human rights issue.

If we use a mid-to-high range water price of \$5.00 CCF (\$.0067/gal), and an extremely high usage number, such as 100 gals/day, that comes to \$0.67 per day. So it is not at all unreasonable to suggest a high working estimate of \$0.70/day for OSL Single Use Space water unit cost.

### *Utility Working Estimate*

The calculations above give us a very preliminary, and intentionally overstated, worst-case working estimate of \$11.70/day as total utility cost for an OSL Single Use Space. This worst-case estimate will be helpful in providing context as we work on developing a more realistic utilities unit cost estimate in the following sections.

### *An RV Donation Rate Model*

Once we have a better understanding of the actual local unit costs associated with operating OSL resources, we can begin working toward a Donation Rate Model that community members can contribute to cover those costs, in addition to a comfortable markup sufficient to cover associated administrative and maintenance costs.

To accomplish this, we calculate three pricing components: Land Use, Electricity Use, and Water Use. For simplicity, we omit any nominal wastewater cost for the purposes of this exercise, which can easily be added by city planners on a per-case basis.

### *Land Use Component*

Approximately \$3/day.

The model begins by establishing a Land Use Fee that applies across all donation levels. We derive this figure from existing 2017 Elks Lodge charges to members storing RVs.

### *Electricity Cost Component*

Approximately \$4.63/day.

To develop a more accurate pricing model, we need more and better data. According to the US Energy Information Administration (EIA<sup>4</sup>), the average California household daily electricity consumption as of 2015 is 18.5kWh/day. RVers have vastly less space to heat and cool, live vastly more modest and frugal lifestyles, and are beholden to the aforementioned “shore line” rate limits, so there is no doubt that usage is far less. The 2017 PGE<sup>5</sup> peak market rate average is \$0.25/kWh (much higher than state average \$0.17/kWh). Utilizing these data, a more likely electricity cost to an OSL operator anywhere in the U.S. is closer to \$4.63/day.

### *Water Cost Component*

Approximately \$3.88/day.

As mentioned earlier, RVers are used to making an 80 gallon water tank last a week or even two, with two occupants. Nevertheless, for the purpose of setting recommended donation amounts, let’s assume each RV uses the same as an entire household uses – lawns and all – every single day. According to SCPR<sup>6</sup> Water Use watchdog site, the average daily gallons used by each Sunnyvale residential customer for May 2017 was 71.82. Most conscientious RVers never even get close to that amount in a day, or even a week. The current 2017 City of Sunnyvale Utility Fee Schedule<sup>7</sup> prices residential water at “\$4.22 per CCF for the first 10 CCF, \$5.15 per unit thereafter<sup>8</sup>” or \$0.054/gal. When multiplied by 71.82 gallons derived above, that is an OSL operator water cost estimate of approximately \$3.88/day.

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<sup>4</sup> EIA Average monthly residential electricity consumption, prices, and bills by state (Excel): [http://www.eia.gov/electricity/sales\\_revenue\\_price/xls/table5\\_a.xlsx](http://www.eia.gov/electricity/sales_revenue_price/xls/table5_a.xlsx)

<sup>5</sup> Source: <http://www.pge.com/tariffs/rateinfo.shtml>

<sup>6</sup> Source: <http://projects.scpr.org/applications/monthly-water-use/city-of-sunnyvale/>

<sup>7</sup> Source: <https://sunnyvale.ca.gov/civicax/filebank/blobdload.aspx?blobid=23726> Accessed 24 July 2017.

<sup>8</sup> One CCF equals 748 gallons.

### *Total Utility Cost Estimate*

Using the figures from the previous two sections (electricity \$4.63 + water \$3.88), a more realistic OSL operator Total Utilities Cost is likely much closer to: \$8.51/day compared to the earlier worst-case estimate of nearly \$12/day. The point of this exercise is merely to demonstrate a reasonable range for baseline costs associated OSL options. Local conditions will obviously vary.

### *Applying the Model*

We can now use the foregoing figures to first illustrate a 100% utilities markup scenario -- roughly rounded to the nearest dollar -- in order to derive one set of suggested OSL Donation Rates. We can then repeat the exercise with a 300% utilities markup, to provide a second OSL Donation Rate scenarios.

These Donation Rates are the proposed prices that participants in the OSL community would contribute to temporarily stay on Open Source Land, whether temporary means five days, five weeks, five months, or five years.

#### *Scenario A: 100% Markup*

- Full Hookups ( $\$8.51 + 100\%$ ) + \$3 = \$20.02 → \$20/day.
  - A 15% discount for extended-stay, monthly Full Hookups visitors give us \$20.00 - 15% = \$17/day, or \$510/mo.
- Dry Camping (Full Hookups - Utilities)  $\$20.02 - \$8.51 = \$11.51$  → \$11.50/day.
  - A 15% discount for extended-stay, monthly Dry Camping visitors give us \$11.50 - 15% = \$9.77/day, or \$295/mo.

### *Scenario B: 300% Markup*

- Full Hookups ( $\$8.51 + 300\%$ ) +  $\$3 = \$28.53 \rightarrow \$29/\text{day}$ .
  - A 15% discount for extended-stay, monthly Full Hookups visitors give us  $\$29.00 - 15\% = \$24.65/\text{day}$ , or  $\$740/\text{mo}$ .
- Dry Camping (Full Hookups - Utilities)  $\$29 - \$8.51 = \$20.49 \rightarrow \$20.50/\text{day}$ .
  - A 15% discount for extended-stay, monthly Dry Camping visitors give us  $\$20.50 - 15\% = \$16.70/\text{day}$ , or  $\$500/\text{mo}$ .

### *A Fair Housing Market Baseline*

The OSL Donation Rates above can now provide a solid market baseline for residential shelter at the most fundamental level in any give city, megacity, county, or region. By populating the housing market with a sufficient number of OSL sites to afford people this choice, a choice they are already making and will continue to make, there is a good chance of creating an economic forcing function to bring other housing option prices into closer alignment with sustainability.

### *How Many OSL Sites Do We Need?*

The AAA Foundation for Traffic Safety's 2015 American Driving Survey average for American daily commute distance is approximately 29.2<sup>9</sup> miles/day. If we use this as rule of thumb, we could suggest that OSL sites be located at approximately half that distance apart, or at 15 mile intervals throughout a megacity urban area. This will provide low wage workers dignified places to live as they serve their local communities in countless underpaid and underappreciated roles. While the scale of each individual OSL site should be adapted to the particular needs of the region, commute distance is another important factor to consider. This is where our main proposal for Decentralized On-Demand Transit can come into play, perhaps decreasing the

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<sup>9</sup> Source: <http://newsroom.aaa.com/2015/04/new-study-reveals-much-motorists-drive/> Accessed 21 July 2017.

density of the sites by half or more, locating OSL sites closer to 30 mile intervals throughout an urban megacity zone.

## City or County Extended Parking Licence

Another additional potential stop-gap policy idea that emerged while discussing our proposal after the submission date is that of licensing RVs and other vehicles for exceptions to posted parking signage, providing some flexibility to the one-size-fits-all parking ordinances. For instance, a city or county could offer an annual vehicle license that authorizes people to park for longer periods of time. Perhaps 7 days, rather than the common 72 hour ordinances in the Bay Area. It would be important that the fee be low enough to encourage full participation and high enough to generate positive cash flow; perhaps \$600 to \$1,200 per year, per vehicle.

This policy can address several immediate needs.

1. Generates revenue from a perceived problem.
2. Eases frequency of costly enforcement efforts.
3. Increases public safety for both urban nomads and residents, as people learn to easily identify Extended Parking licensed vehicles, decreasing concerns about temporary neighbors.

## Closing Remarks

We understand the claim that OSL can create a perpetual housing market-stabilizing effect by providing a sustainable, resource-based, universally accessible, entry-level pricing benchmark for shelter in the twenty-first century urban megacity context is a bold one, and hope that these ideas have lived up to the high expectations set in the RFP.

We look forward to answering any and all questions promptly, as required.