

**domus**  
portable shelter



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# Thesis Statement

*We can provide a product to give shelter to the homeless without compromising dignity and freedom.*

Homelessness is an undeniable problem throughout the world. Currently it is estimated that there are over 100 million people without housing, 20-40 million of these people are in the world's urban centers. In the US, San Francisco has more homeless per capita than any other city. When I moved here, the homeless problem became impossible to ignore. I lived for a while in Haight Ashbury area, which is literally over run with runaways, free-spirits, the disenfranchised, the mentally ill, those down on their luck, and even homeless posers that call Golden Gate Park home.

When choosing a topic, it crossed my mind that a consumer product - for profit - may look better in my portfolio. Some firms may want to see a successful design that could make them money. I've always had compassion for those that have less, or nothing at all. My family has a legacy of helping others, through volunteering at soup kitchens, shelters, teaching illiterate adults to read, and mentoring inner-city youth.

I think we all have a responsibility to help our fellow people, and when people loose everything, at the very least they should have a dry place to sleep.

My target is to help homeless in San Francisco that choose not to live in city run shelters, due to distrust, fear, or need for independence from a government run facility.





Glide Memorial Church & Shelter  
Mayor Dianne Feinstein



Homeless carts  
Mayor Art Agnos



SF Police arresting homeless man  
Mayor Frank Jordan



Civic Center Plaza  
Mayor Willie Brown



SF Connect  
Mayor Gavin Newsom

1978

## Policies

Temporary cots and soup kitchens in church basements

Emergency Shelters like Glide – many claim this was the wrong solution, creating a permanent transient population

Police sweeps of Golden Gate Park and Civic Center Plaza using anti-camping laws to get people off the streets

1988

## Policies

Viewed as permanent crisis

"Beyond Shelter" plan creating affordable housing and the first city-owned shelters, with support services

1992

## Policies

Too many homeless because of benefits

"Beyond Shelter" plan creating affordable housing and the first city-owned shelters, with support services

Refused to evict hundreds of homeless who had set up camp in Civic Center Plaza became known as **Camp Agnos**. This ruined his political career

1996

## Policies

Announced "Homelessness is not a city-solvable problem. **Homelessness is a societal problem.** There can be more organized efforts to provide services... but they will not come close to curbing homelessness."

Stepped up police enforcement of anti-camping laws in Golden Gate Park

Remodeled Civic Center Plaza and chased out homeless with police citations

Closed Mission Rock shelter to make way for Giants parking lot near Pac Bell Park

Claimed he underestimated the "irrationality quotient" of the homeless. He said he can't help those who refuse help – the mentally ill, paranoid about government, or those who won't give up outdoor lifestyle.

Due to the unpopularity of his homeless policies, Mayor Brown went silent on homeless during second term

2004

## Policies

"Care Not Cash" July 2004 – substituted direct aid for rent vouchers. 5,000 have been given permanent shelter, 1,318 have been given permanent housing and support

SF HOT – San Francisco Homeless Outreach Team – helps disabled homeless access housing and health services

PHC – Project Homeless Connect – bimonthly events bringing all necessary services under one roof

# Research

## Project SF Connect

In 2004 Mayor Gavin Newsom started Project Homeless Connect, which is a bimonthly event that provides a range of resources for the homeless in a single location. The event is run by 1,500 volunteers, and serves approximately 2,000-2,500 homeless clients.

An October 2006 event placed 112 people that had been sleeping on the streets into shelters or stabilization rooms

### Project SF Homeless Connect 2/28/2007

February 28th's Project Homeless Connect was held in the Billly Graham auditorium, and helped over 1500 Homeless "Clients" with the following services:

Medical Services  
Vision - glasses made on site by Lens Crafters  
Legal Aid  
Housing and Shelter services  
State ID cards issued by DMV - my booth - we issued over 400 State IDs  
Free long-distance calls from Sprint  
Free Groceries from Safeway and Trader Joe's  
Job Placement

This gathering is held bimonthly, and staffed by over 1000 volunteers - many from local businesses



## Health Issues

San Francisco has the highest TB infection rate of any metropolitan area in the United States -- three times the national average and twice the California state average.

Unfortunately, people who are dealing with basic survival issues aren't likely to run to the doctor for a cough, and maintaining a long-term, multi drug regimen can be difficult for a homeless person.



## Security Issues

There has been a disturbing trend of people, mainly teens and young adults attacking homeless for fun. "A 2006 report by the National Coalition for the Homeless found 142 attacks last year against homeless people, 20 of which resulted in death - a 65 percent increase from 2005, when 86 were violently assaulted, including 13 homicides."

Many homeless in San Francisco choose not to sleep at night, for fear of getting "rolled" or robbed and beaten. Instead they choose to walk the streets at night, and sleep during the day. In areas such as the Tenderloin with large drug presence, homeless are terrorized by roaming groups of drug dealers at night, who regularly rob them.



# Research

## San Francisco's Homeless Problem

The official homeless count in 2005 showed a 28% decrease from 2002. In early 2007, volunteers set out to get a more accurate count, they accounted for 6377 homeless. This doesn't take in consideration those living in cars, or staying with family or friends.

15% of the homeless population is mentally ill

In 2003, the median numbers that a homeless person in San Francisco has lived on the streets was 8 years, up from 2 years in the 1990-94 time period

The average age of a homeless person in San Francisco was 46 years old in 2003, up from 37 in the 1990-94 time period

San Francisco Homeless Population



Median number of years living on the street in San Francisco



# Research

San Francisco's Homeless Problem



2002  
Total: 8640



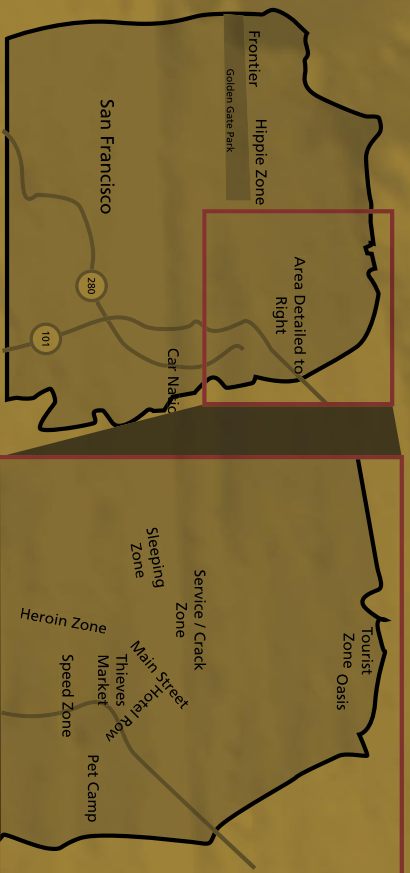
2005  
Total: 6248



2007  
Total: 6377

# Research

## Homeless Communities



*Frontier* - The hardest of the hard core take their backpacks and hide in the hills of Golden Gate Park to avoid park rangers.

*Hipple Zone* - The homeless among Haight-Ashbury are mostly runaways, addicts and abandoned kids.

*Tourist Zone* - Most of the homeless here are day trippers because this area is far from medical, housing and food services.

*Oasis* - The North Beach Citizens homeless charity group provides day jobs, food and a clean place to hang out.

*Sleeping Zone* - For the homeless that don't chose to walk at night, many seek refuge here.

*Service/Crack Zone* - The only homeless people who sleep here are those who pass out or who group up with sentries.

*Main Street* - Alcohol is a big vice here, but methamphetamine, crack cocaine and heroin are also easily had on any corner.

*Heroin Zone* - This has long been where heroin dealers traffic, so homeless addicts come here to buy, sell and hang out.

*Thieves Market* - Homeless come here day and night, standing just east of the fountain to openly hawk their stolen wares.

*Car Nation* - Beat-up RVs, trailers and vans dot the streets and empty lots near Interstate 280 and down toward the water.

*Pet Camp* - Everything from cats and dogs to a pet seagull lives here in harmony, but police sweep campers out periodically.

*Speed Zone* - Speed users sleep there with their bicycles - since the high-energy drug makes it easy to pedal.

*Hotel Row* - Though there are many SRO hotels around the city, this concentration gives the area its identity as SRO central.



# Research

## Who are our Homeless?

Through observation and research, it's clear that there are two main categories of homeless in San Francisco. The first is those who are homeless by choice, and the second is those who are homeless not by choice. Although there are distinct differences, there is also a fair amount of cross-over. Many who begin as runaways or simply don't want to fall in line with society end up locked into the lifestyle with no easy way out due to drug addiction or other factors. What has been realized is that many people don't want the help of the government or society, Willie Brown once said "I said he can't help those who refuse help - the mentally ill, paranoid about government, or those who won't give up outdoor lifestyle."

Runaways  
Hipies  
Rockers  
Bimmers (make money by recycling)  
Burnt out from society  
Artists  
Behind in Bills

Mentally Ill (Reagan emptied institutions)  
Laid off / Fired  
Elderly who can't afford housing  
Drug Addicts looking for help  
Skilled / Unskilled laborers looking for work  
Sick without benefits  
Outcasts  
Veterans

# Research

## POEMS

People	Object	Environments	Media	Services
Homeless Citizens Police Family Service Providers Community (Homeless) Tourists Volunteers Dealers Merchants	Transportation (Car or Bike) Clothes Cart Sleeping Bag Drugs Alcohol Sentimental Objects Pets Instruments Drugs Paraphernalia Food	Vehicle Park Store Front Friends home Abandoned Buildings Alleys Shelters	Street Sheet (Newspaper) Signage Word of Mouth	Hospitals Police Drug Counseling Alcohol Counseling Health Clinics Mental Health Homeless Connect Volunteer Services Family Support

# Research

## Dignity and Freedom

There is a population of homeless people that want to live respectable lives, work for their money, and not be bothered. Many of these people live in their vehicles or in SROs (Single Room Occupancy Hotels), and enjoy a certain level of dignity, knowing they support themselves, and live a free if unconventional life style.

Families such as the one to the left work to keep a room in an SRO, where they have been now for 6 years. For many with children who want to stay off the streets, this is the only reasonable housing option.

Another SRO resident has been moving from hotel to hotel for years, unable to get credit or make enough money to afford his own residence.



Ronnie "Doc" Sutro (to the right) got tired of listening to cops and counselors tell him every few hours to stop panhandling in downtown San Francisco. "Sign up for housing, they said. Get drug rehab."

"Didn't want to hear the nagging," Sutro, 36, said with a shudder, recalling his exasperation. "Been homeless for six years. Not ready to change."

"It's no big secret that we stay here," said Red Bull, 47, pushing a shopping cart of scrounged cans alongside Ocean Beach one evening. "We're not hurting anyone. We've gone as far west as we can go, and we'd be in the ocean if we went any further."





## Observations

I interviewed homeless, residents of areas surrounding Golden Gate Park, those living in areas such as underpasses, those who worked in Golden Gate Park, and those who visit the park regularly.

The park seems to have the largest single homeless population – so I wanted to get an idea of the public's opinion of those who were living there, and see if people thought my idea of providing portable homeless shelters would only increase the problem.



## Observations

*“In order to truly understand street people, their lives, and their community it is necessary to become an insider and to gain legitimacy.”*

-David Wagner, Checkerboard Square

I interviewed four homeless people at Cole & Haight Streets - their ages ranged from 17 to 26. I happened to be returning from the liquor store with a bottle of Captain Morgans, with no intention of talking to them, but decided to offer them the bottle if they'd chat for a while.

All were from the Bay Area, but left home either to “slum” with friends, or escape horrible home conditions.

Their lifestyle was composed of sitting on their corner during the day to beg for money, or occasionally score some drugs in the park, and turn and sell to others for money. The travelled in a group at all times. They had two dogs with them - I didn't ask how those were taken care of.

In short, this was their family. They had the option to go home, but they preferred this lifestyle - they could do as they please, and most importantly didn't have to deal with abusive households.

This group chose to carry their belongings in their backpacks - they could move anywhere anytime. I threw out my idea, which was pre design phase, and they said they'd definitely use some time of portable shelter... something they could sleep in, and move around in.



***“It actually bothers me more when I don’t see them around, because I have to wonder where they go.”***



**Don**  
Area Resident

**Do you live in the city?**  
Yes, right up the street

**Do you spend much time in the park?**  
Absolutely. My wife and I are part of the park trust, we spend quite a bit of time here at the museum, conservatory, and can't wait for the new museum to open. We're here exercising all of the time, raised our kids playing in the park.

**The mayor has recently started to re-enforce his plan to push the homeless out of the park, how do you feel about that?**

It actually bothers me more when I don't see them around, because I have to wonder where they go. I've never felt threatened by the homeless, their camps can be an eyesore, but I don't know where you're going to push them off to.

**For my thesis I'm exploring the idea of providing portable homeless shelters, so that they'll have shelter that they can keep with them at all times, as a resident what would you think of that?**

I think it's an excellent idea, I wish you the best of luck.

**Do you think that would encourage people to stay homeless?**  
No, they already make their make-shift shelters as is, I do think they need protection from the elements.



***“Actually, (the shelters are) interesting, some are very creative.”***



Carolyn, Trisha, Judy  
visiting on lunch break from Sacramento

Do you live in the city?  
No, we're from Sacramento

Do you come down to the park much?  
Yes, we do

The mayor has recently re-enforced his program to move the homeless out of Golden Gate Park – have you noticed a change?  
We haven't noticed. There was a program like that up in Sacramento, they tried to move the homeless out of park there, cleaned up the park, landscaped it, and in the end, the homeless just liked it more.

Well if they continue to enforce it here, do you think it will make a difference?  
No, they have to go somewhere

Do you find the make shift shelters that you see around the park an eyesore?  
Actually, they're interesting, some are very creative.

How would you feel if there was a program to distribute individual portable shelters for them?  
I think it's a good idea, they need shelter from the rain and some of the make-shift look pretty shabby.

***“No – I’d rather know (the homeless are) in the park, then have them scattered through the streets.”***



Jon  
Area Resident

Do you live in the city?

Yes, in Haight Ashbury, 2 blocks from Golden Gate Park

Do you spend much time in the park?

I go there occasionally

Do the homeless that live there bother you?

Only around the entrance to the park, because they hassle you there. Other than that I think they have as much right as anyone to be there

The mayor is re-enforcing his program to push the homeless out of the park. Do think it will work?

Well obviously they'll move if their forced to.

Do you think this is a good solution to the problem?

No – I'd rather know they're in the park, then have them scattered through the streets.

*“I guess its really the homeless by choice that bother me – to think they have an income, and me the taxpayer is getting screwed.”*



Ross  
Hot Dog Stand Vendor in Golden Gate Park

Do you live in the city?  
Nope

Do you spend much time in the park?  
Here all of the time.

What's your perception of the homeless that live here in the park – do you see it as a nuisance?  
I've done a lot of research into the homeless project when I first moved here. People told me it was because the Reagan administration cutting funding for the mental hospitals and releasing patients, but that's not really what I see. There are some that do have mental problems, but they mostly keep to themselves. I see it a division of those who have serious problems, but what I see more of are those that are homeless by choice.

Right – those that are run aways or “slumming for fun”  
Exactly – I read that the homeless in San Francisco are the wealthiest in the nation – many make \$30-35,000 a year – that's what school teachers make. I've heard a lot of these kids who are up on Haight street really live in Berkeley, with their parents – they just do this to act cool. I guess its really the homeless by choice that bother me – to think they have an income, and me the taxpayer is getting screwed.

Well my project is looking at providing some type of portable shelter – so these people can keep their belongings, and also keep from the elements.  
I see that as a good idea, but you have to think of who deserves and needs these things.



*“Generally (I am received) very well. Many are happy to tell their story to someone.”*



Chuck (C.W.) Nevius  
Reporter for the San Francisco Chronicle

When you interview homeless people how do you usually approach them?  
I just go up, explain that I'm a journalist, and ask if they would talk for a while.

How are you received?  
Generally very well. Many are happy to tell their story to someone.

For my project I'm planning on spending a week living out in the park - have you ever done any undercover work? Do you think it would be better for me to make up a story or tell people from the start I'm doing this for a project?  
I prefer to present myself as who I am. I think in your case it would be unnecessary - you'll have to follow your story very carefully. Whereas if you just tell people that you're a student, I think you'll find that they will be interested in it as well.

Advice:  
- Definitely be on in and out - meaning you just go into the park late at night to sleep.  
- The rousts have been happening around 4 a.m., but if you notice the park police around a certain area during the day, you can figure that they'll be back that night.  
- Bring along camera and phone, but don't let people see them  
- Stay in the west or near the fields & fly fishing ponds- safer  
- A week may be too long  
- Try to buddy up with someone - if there is someone on Haight Street that you see often, try taking them out for coffee or food... then do that several days in a row to establish a rapport with them. Old veterans are often happy to have someone to talk to.  
- Make contact with Jerry Harity - older homeless man with a big white beard that hangs out at the top of the hill down the path by St. Luke's hospital - bring him a beer and he'll chat for a while. He's on the SF Chronicle website in a video interview

Chuck has asked that I keep in touch with him throughout the process, and he said he'd like to come out to the park and meet with me to see how things are going. He's especially interested in seeing if I'm rousted by the park police... and finding out how they really treat people. He recommended that I carry some sort of credentials on my to avoid an mistreatment by the police. Due to his recent articles pointing out specific encampments in the park, the police have gone and cleared those places out... so he's started to be known by the homeless community, and in a negative way.

# Observations

Golden Gate Park

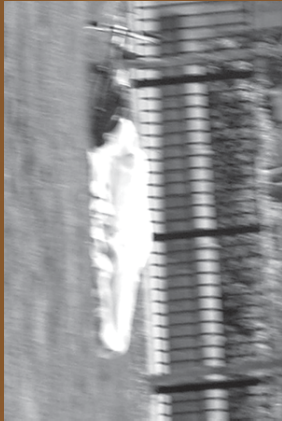
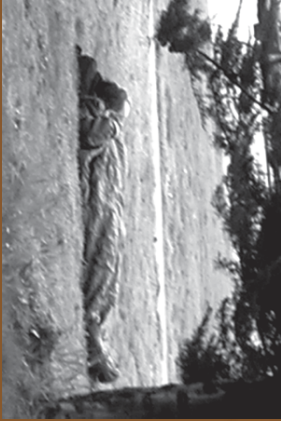


Ocean Beach



Observations

Golden Gate Park



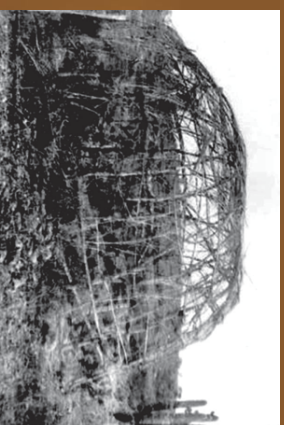


## Existing Solutions

When starting my project I deemed sustainability and portability necessary. Instead of beginning with the newest technologically advanced materials, I looked back to nomadic cultures and cultures who built their dwellings using only materials that were immediately available to them. Some of these structures are still used in slightly modified form today. From this process I began exploring the idea of using materials such as bamboo, which grow several meters a day, and could be planted in Golden Gate Park. In addition, dozens of trees are removed each week from the park – could these be used to build shelters?



Mongolian Yurt before being covered in animal skin



Frame of wigwam before being covered in grass and bark



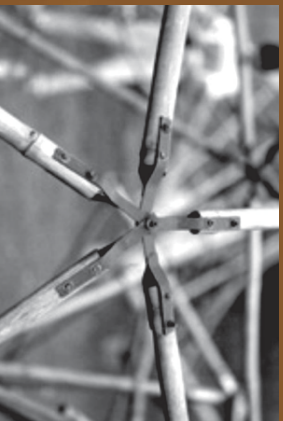
Native American Ti pi – made of wood and animal skin



Navajo Hogan

## Existing Solutions

Since bamboo has so much potential as a renewable resource, I began to look at other structures built with bamboo - such as scaffolding and small geodesic domes. At this stage I built a geodesic dome shelter out of cardboard using dimensions I found online. In the end I decided that although this was a structurally sound design, it was not as portable as it would need to be for use in the park, and required a certain level of skill to construct.



Some of the current shelter solutions were actually very similar to what I was imagining - the pop-up shelter below especially. I had done several sketches almost identical to this one. I liked the shelter in a cart idea though because it was extremely portable, and provided a way to create income, by using the cart to collect recyclables. Some of the other contest entries integrated a bicycle for not only personal transportation, but also the transport of others, again for a source of income.



Emergency pop-up shelter



Designboom Shelter in a Cart Contest Winner

# Observations

## Existing Solutions

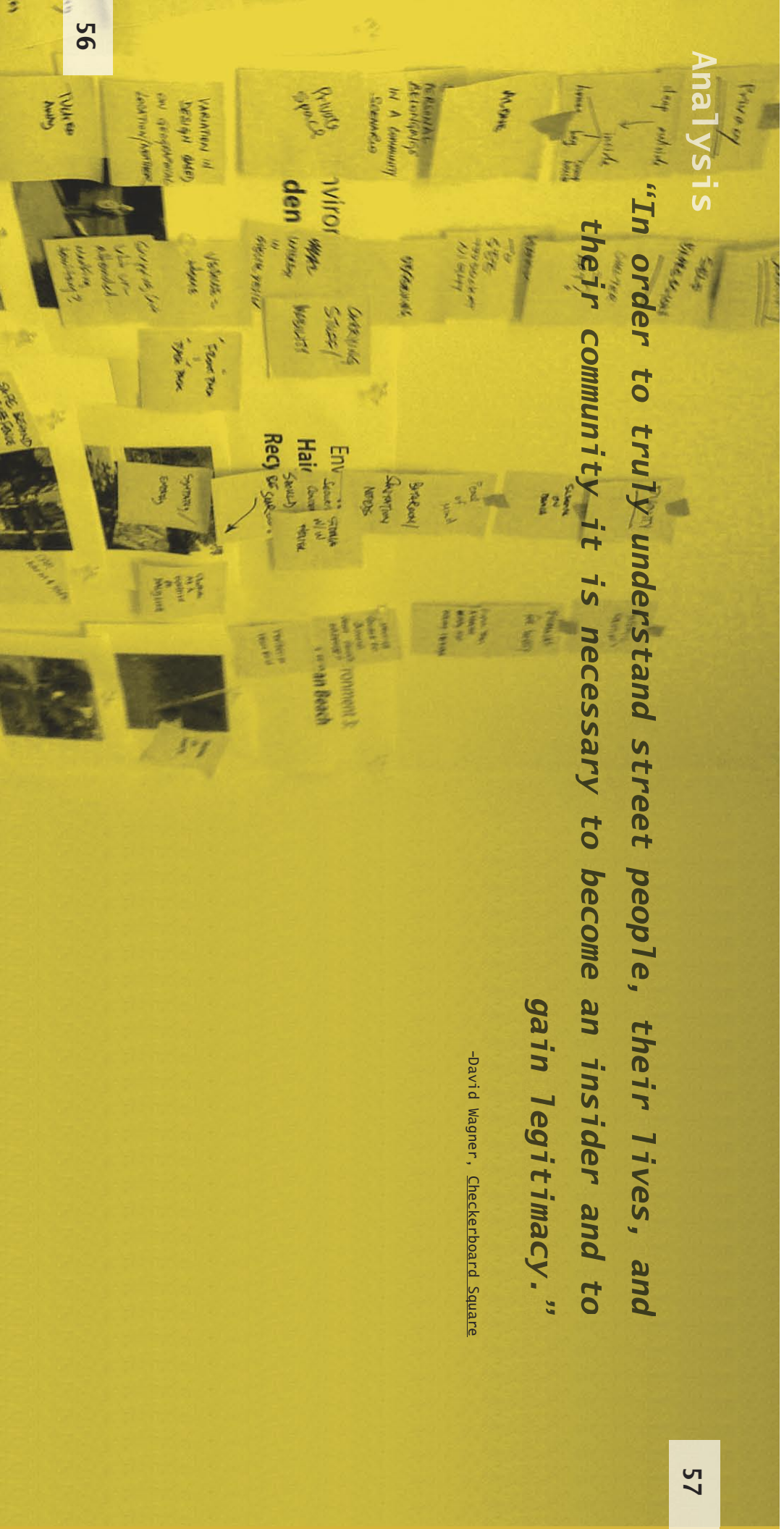
The EDAR (Everyone Deserves a Roof) is a privately funded shelter program, that provides their shelters to the homeless free of charge. Design as part of a competition with Art Center, the designers and builders work pro bono on the construction. The group takes private donations through their website, and a complete shelter costs \$500. Essentially based on heavy duty shopping cart like construction, the shelters are portable, but are heavy, and still large, even when folded up.





**"In order to truly understand street people, their lives, and their community it is necessary to become an insider and to gain legitimacy."**

-David Wagner, Checkerboard Square



# Analysis

Source of income from found objects

Need for Private Space

Panhandle Bandshell

Customize

Group Together

Give back to community

Vehicles used as homes – warm and safe

Permanent vs. Temporary Housing

Must carry personal belongings with

Government program

Community / Interaction / Connection between friends

Variation in design based on geographic location?

Found Objects > Shelter > Art > Income

Littering problem

Motivational lectures

Shelter = Art

Safe behind fence – unsafe on other side?

Develop relationship

Peace of Mind

Personal belonging in community scenario

Isolated Zones

Funded

Large metal containers – could be used?

Protection from Rain

Community of new homeless

Sleeping on Bench

Performance Art

Music – play bongos / guitar

"Front" pack vs. "Back" pack

Makeshift furniture

Found objects influence theft?

Group Safety

Hard to see at night

Polite / Friendly

Hanging out at Public Facilities

Shelter as part of community – admitted for creativity

Isolated Camping Zones

Homeless by choice

Personalization

Community center at park for homeless

Temperature cold at night, even death

Stay in tucked away areas, avoid park police

Expression / Creativity

Innovative use of materials

Music concert by homeless to raise money

Rules most conform to or are pushed out

Shopping cart = Carry-all

Festival

Needle dispensaries

Observing each other

Camp shelters in park

Commerce – sell plants at recycle center for money

Sleeping inside vs. outside

Exchange creations for money

Homeless politics / hierarchy

Respect for / by community



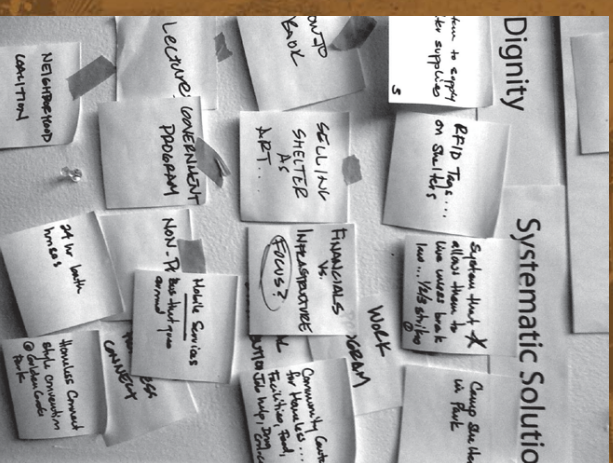
# Synthesis

*“Not all communication arts heal, but all healing arts have roots in communication.”*

— Steven Heller

I synthesized the analyses into 5 distinctive categories which I felt were key issues that my finished project had to address. Each of the analyses was placed under the category with which it most closely associated.

At this point, as a class we brainstormed for different directions in which our final projects could head. It was at this stage that the concept of a truly systematic solution came up. The idea that the shelters could be not only viewed as a work of art, but that they could potentially be sold or used in competition to not only build on the homeless community, but their interaction with the surrounding residents. In my observations I photographed the Haight-Ashbury recycling center where many of the homeless go to sell bottles and cans for a small amount of money. This recycling center also takes large items, and I noticed several contractors collecting reusable items - why couldn't these be used as found items to create a shelter? Being able to tap into the users creativity, and appeal to the surrounding community's support of the arts grabbed me, something heading in this direction really could benefit everyone, and tie into the Haight-Ashbury culture at the same time.





# Synthesis

## User's Creativity

Customize

Makeshift furniture

DIY

Music - play bonnos / guitar

Expression / Creativity

Festival

Innovative use of materials  
Sell shelter as art

Art Show - Contest

Music concert by homeless to raise money

Performance Art

## Social Implication

Needle dispensaries

Bathroom / Sanitation needs

Group Safety

Group Together

Found objects influence theft?

Littering problem

Give back to community

Permanent vs. Temporary Housing

Rules most conform to or are pushed out  
Government program

Community - Interaction / Interac- tion between friends  
Camp shelters in park

Unattended Shopping cart - mark territory?

## Systematic Solution

Found Objects > Shelter > Art > Income

Isolated Camping Zones

Panhandle Bandshell

Motivational lectures

How-to book

Commerce - sell plants at recycle center for money

Exchange Creations for money

Mobile Services

Large metal containers - could be used?

Funded

## Community Impact

Community of new homeless

Homeless politics / hierarchy

Develop relationship

Peace / Friendly

Community center at park for homeless

Variation in design based on geographic location?

Shelter as part of community - admitted for creativity

Observing each other

Respect for / by community

Shopping as function of everyday life

Sleeping inside vs. outside

Recycling Centers near houses - Personal complaints belonging in community scenario

## User's Dignity

Peace of Mind

Need for Private Space

Protection from Rain

RFID Tags on Shelters

Hanging out at Public Facilities

Stay in tucked away areas, avoid park police

Isolated Zones

Safe be- hind fence - unsafe on other side?

Tempera- ture cold at night, even death

Sympathy / Empathy

Shopping cart = Carry-all

## Design Principles

*Since those cut off from the benefits of society are often angry, at least some of their resistance will fail to meet the approval of middle-class observers because it will be deemed unproductive or self-destructive.*

From the synthesized categories, I formed my design principles, from which I've begun sketching different ideas for my final concept. Some are serious, some are more abstract.

- David Wagner

My project will have a positive impact on the neighboring community.

My project will help to change the community's negative perception of the homeless in Golden Gate Park.

My project will instill a sense of dignity in its users.

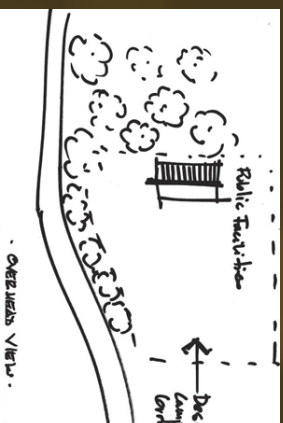
My project will not be a one time fix, but rather a systematic solution that will continue to help not only the current users, but others in the future homeless community.

# Brainstorming

From my design principles and class discussions I went through a quick ideation process. As an idea popped into my head, even if unrealistic, I used a Sharpie and did a quick sketch. From these I was able to filter out the duds and come up with some solid ideas to go forward with



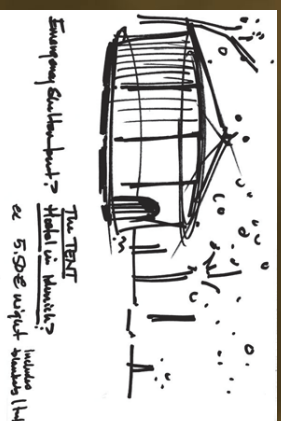
Syringe disposal containers throughout park



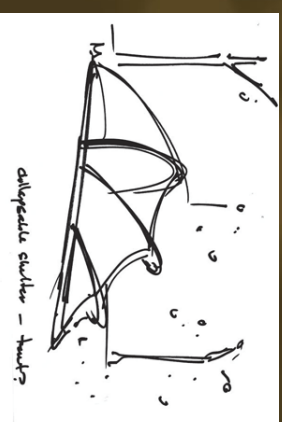
Designated camping area



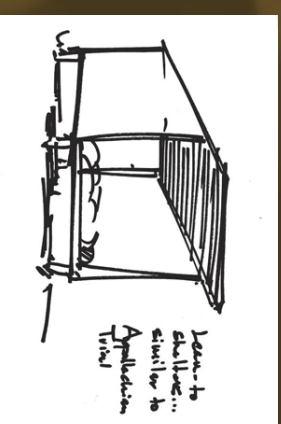
System to supply shelter materials from recycling center



Munich's TENT hostile - big top tent with communal sleeping area



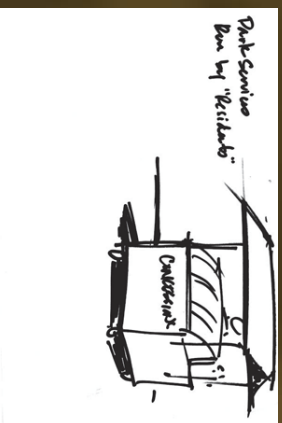
Quick collapsible tent like shelter from sustainable materials



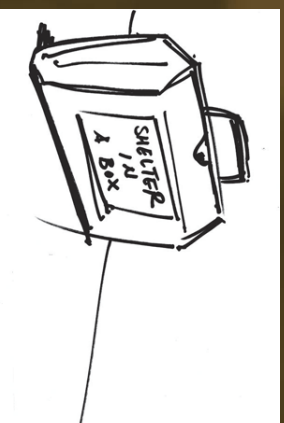
Appalachian Trail style camp shelter



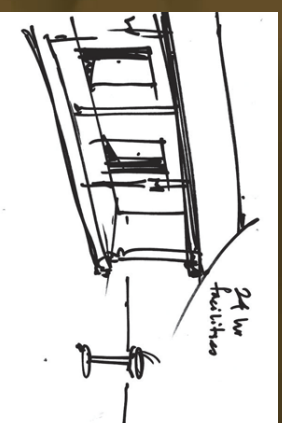
# Brainstorming



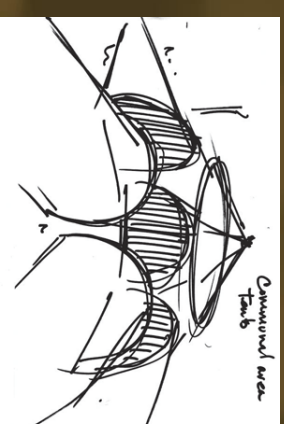
Job opportunities in park



Shelter kit that requires user input, customizing



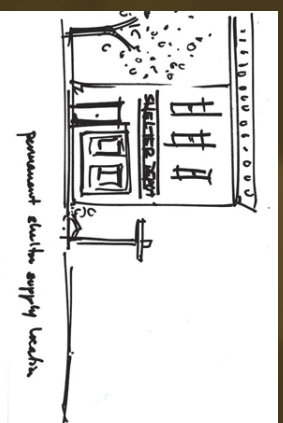
24 hour sanitary facilities



Tent/shelter that can be used for community encampment



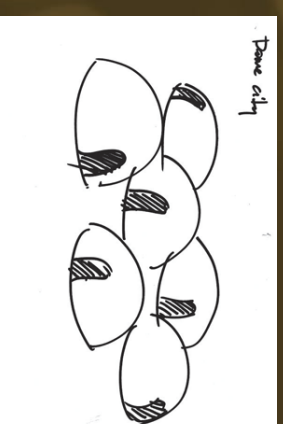
Organized events to clean up park - give incentive for homeless to help



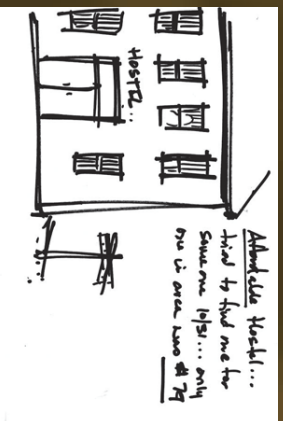
Permanent location near park to provide shelter materials, and find perm. shelter



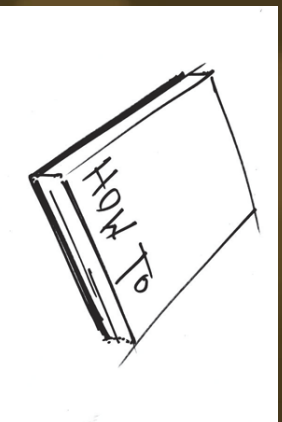
Mobile shelter supply vehicles



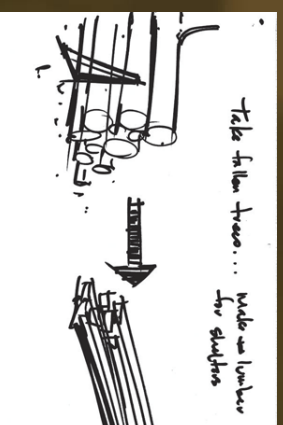
Dome village model



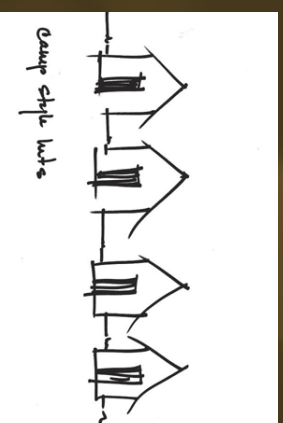
Affordable \$80 hotels or hostels in the park area



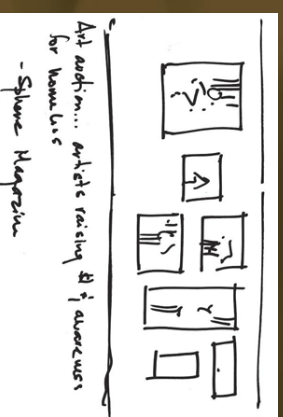
How to manual to build your own shelter



Use fallen and cut trees for shelter supplies



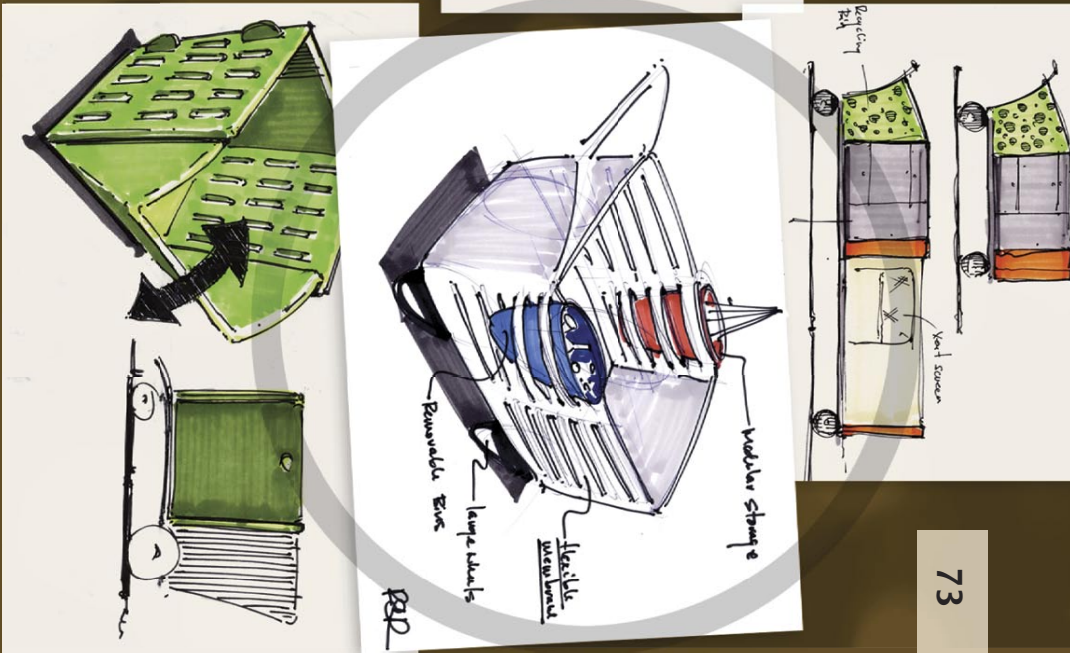
Camp style housing



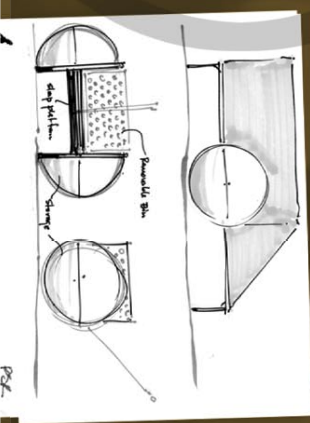
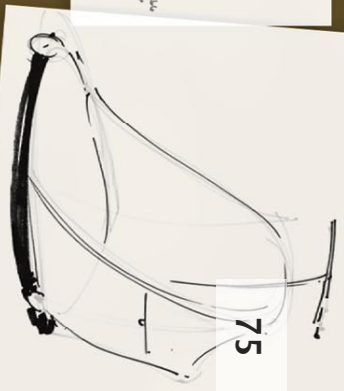
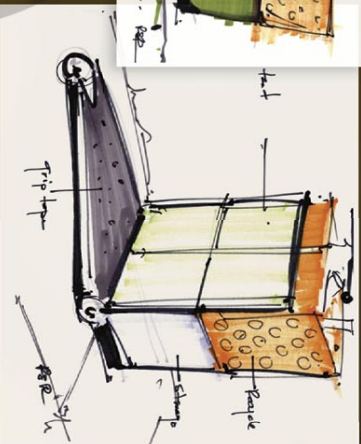
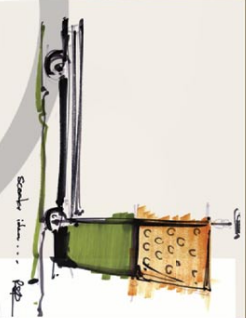
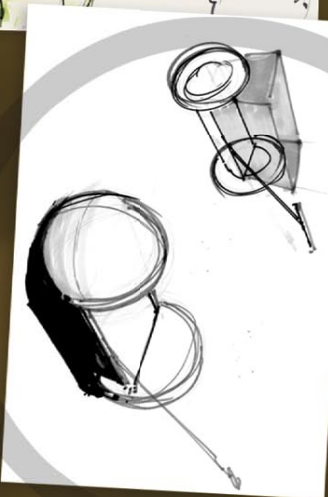
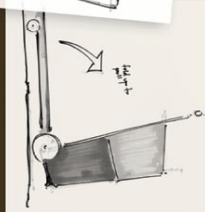
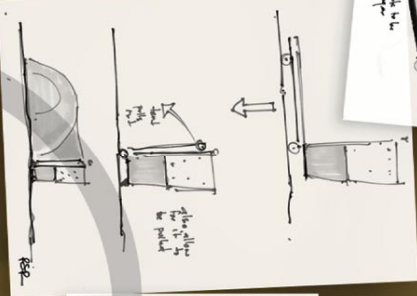
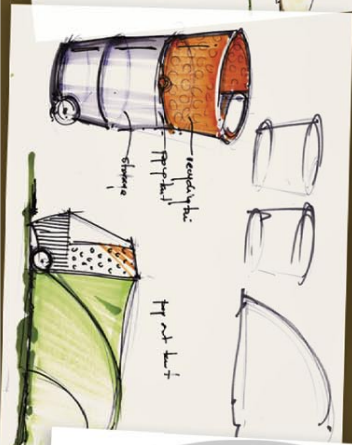
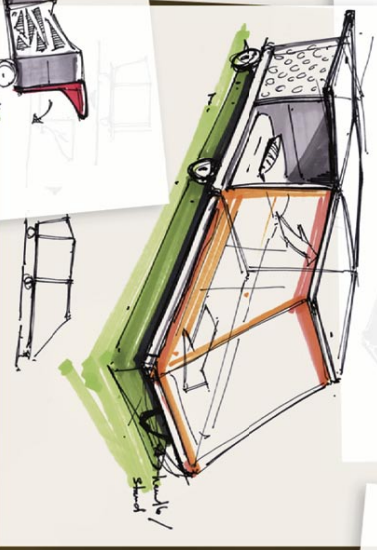
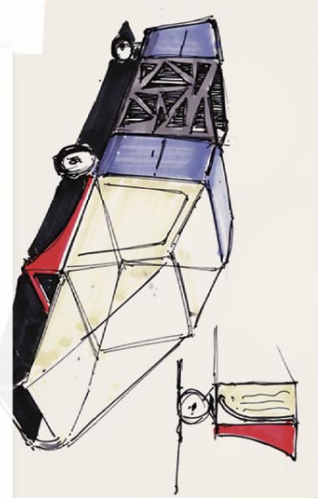
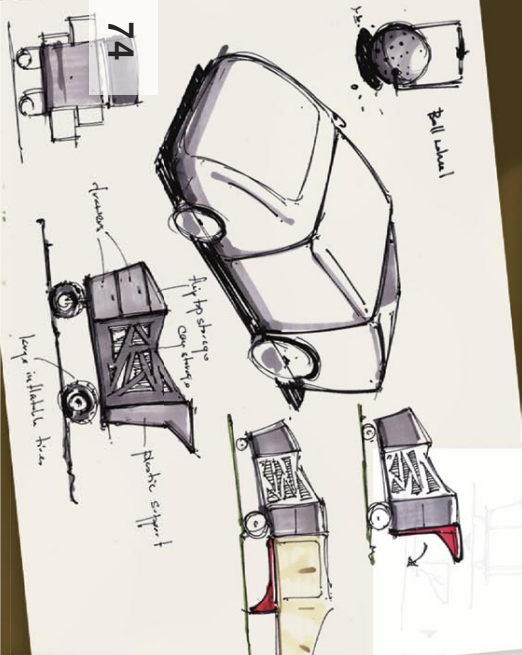
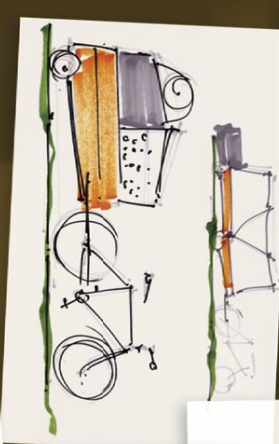
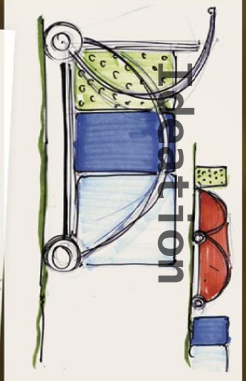
Art competition & auction benefitting the homeless... either by homeless or well known artists

**“...street people struggle to survive resisting the dominant institutions... while at the same time developing alternative forms of social organization.”**

- David Wagner

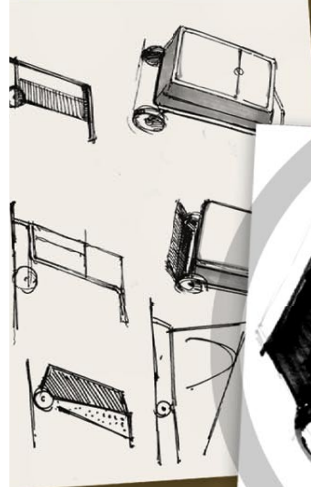
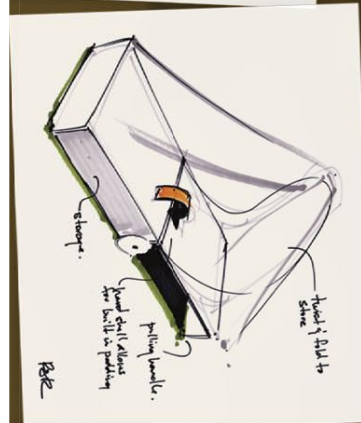
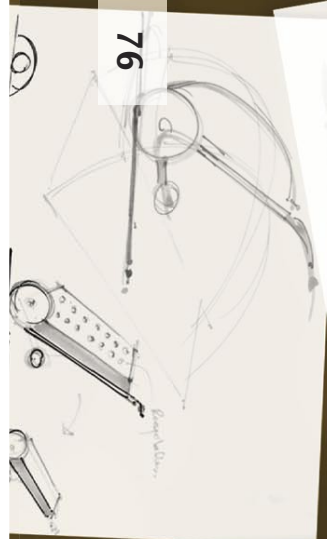
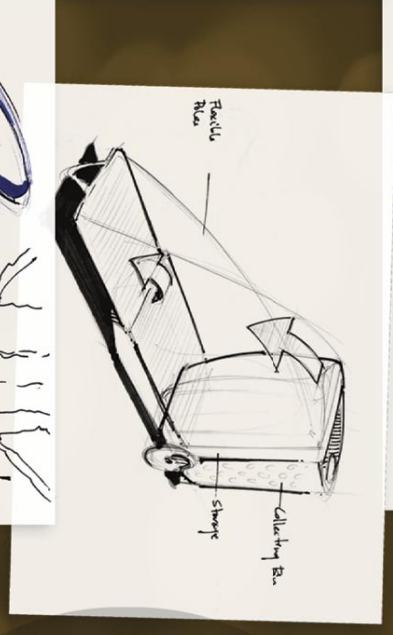
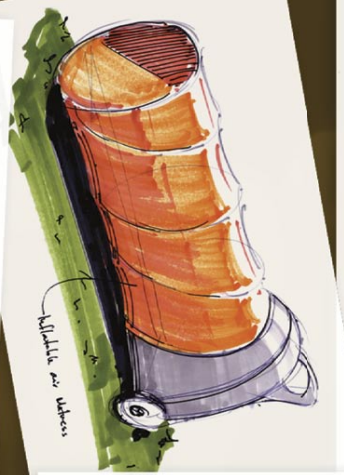
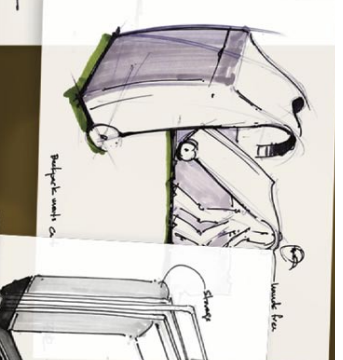
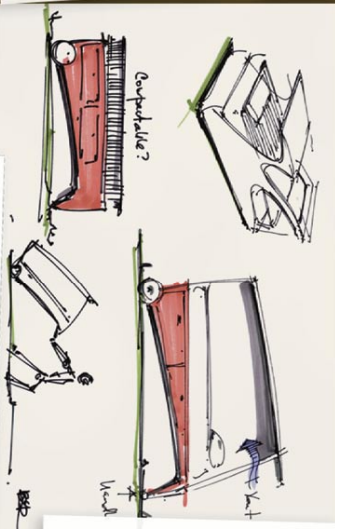
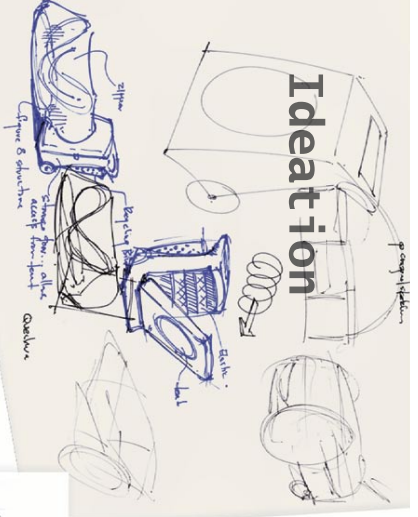








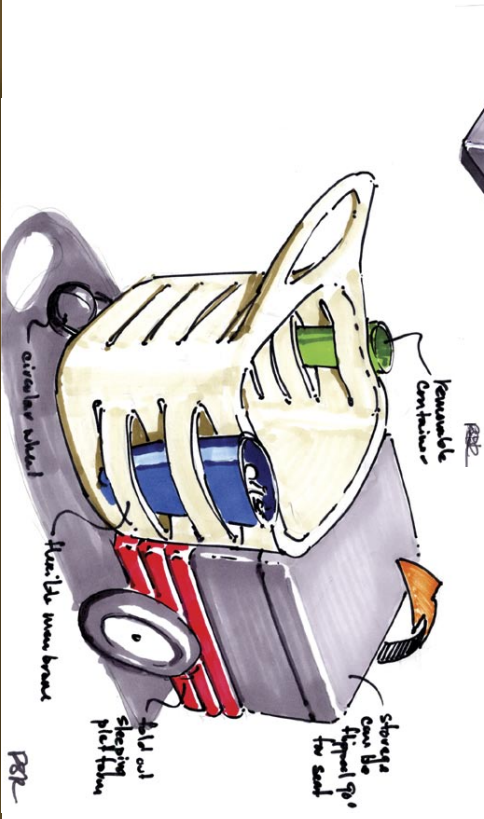
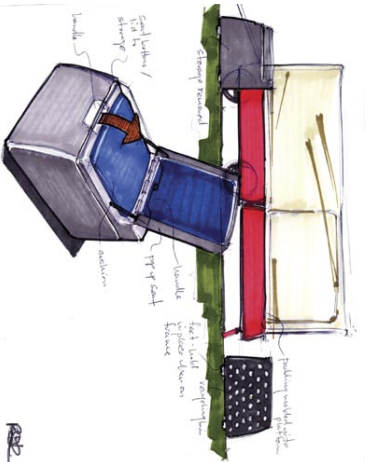
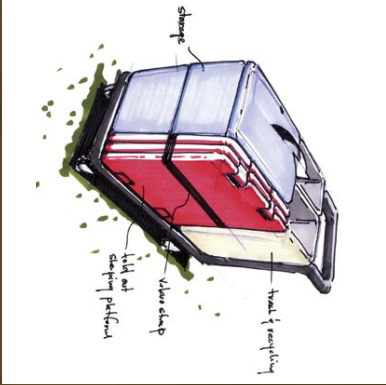
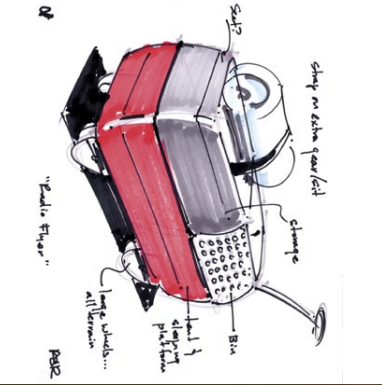
# Ideation



Concept Development

concept 1  
radio flyer

The idea of a "Radio Flyer" shelter appealed to me partly because of the pop-  
icon status of the wagon,  
and also because of the  
purely utilitarian design of  
it. With four large wheels,  
it can be transported over  
a variety of terrains, it  
can support a large amount  
of weight, and is free  
standing. In addition, it  
is a recognizable shape,  
that evokes fond memories  
and positive thoughts to  
both those using it, and  
those viewing it.









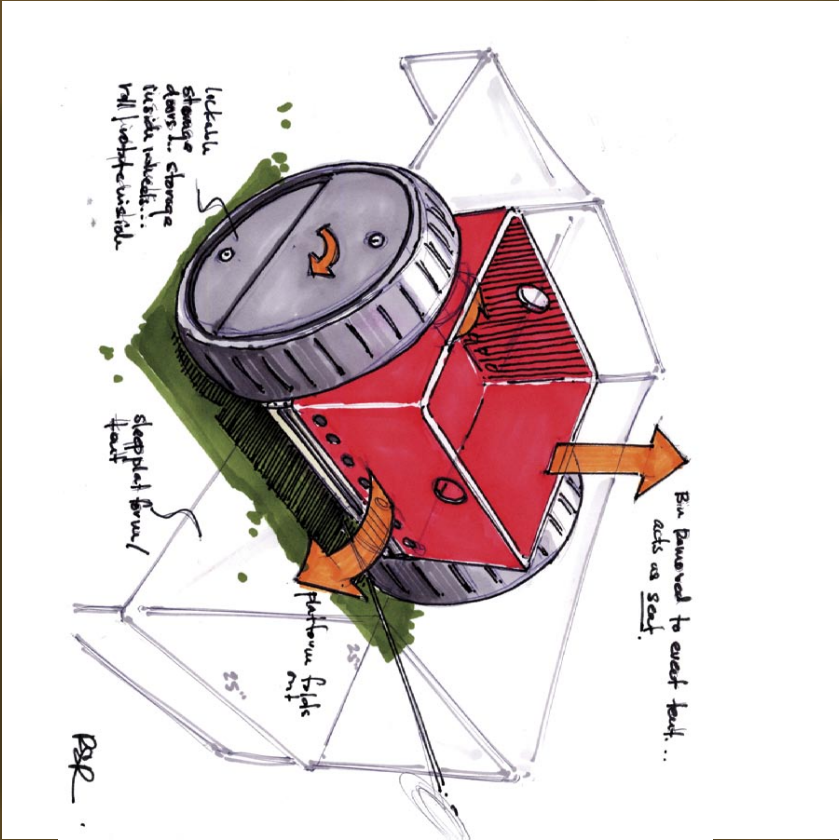
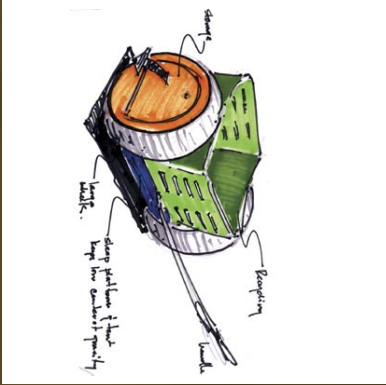
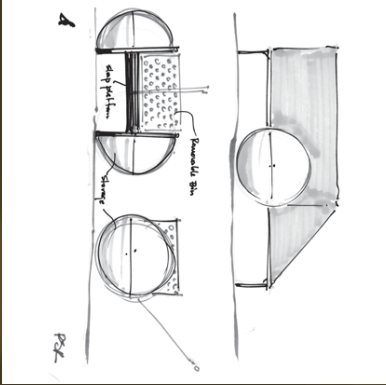
# Concept Development

concept 2  
wheel barrel

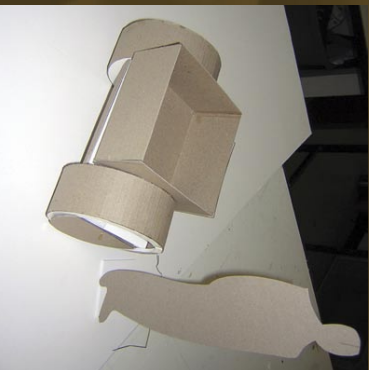
The wheel barrel concept grabbed my interest because of its bold graphic presence.

I wanted to explore using larger wheels to handle various terrains, and with this concept, I realized that the center of the wheel could be used for storage.

By placing additional storage below the center platform, and below the center of gravity, the mid-section wouldn't be prone to spilling over when parked. A silicon recycling bin would sit on top of the platform for collection, and be removed and placed upside down for seating while stationary.



## Concept Development



Left: With the recycling bin removed, the sleeping panel may be unfolded.

Below: The cover and internal structure are permanently attached, but are not shown in the photo to the left for demonstration purposes.

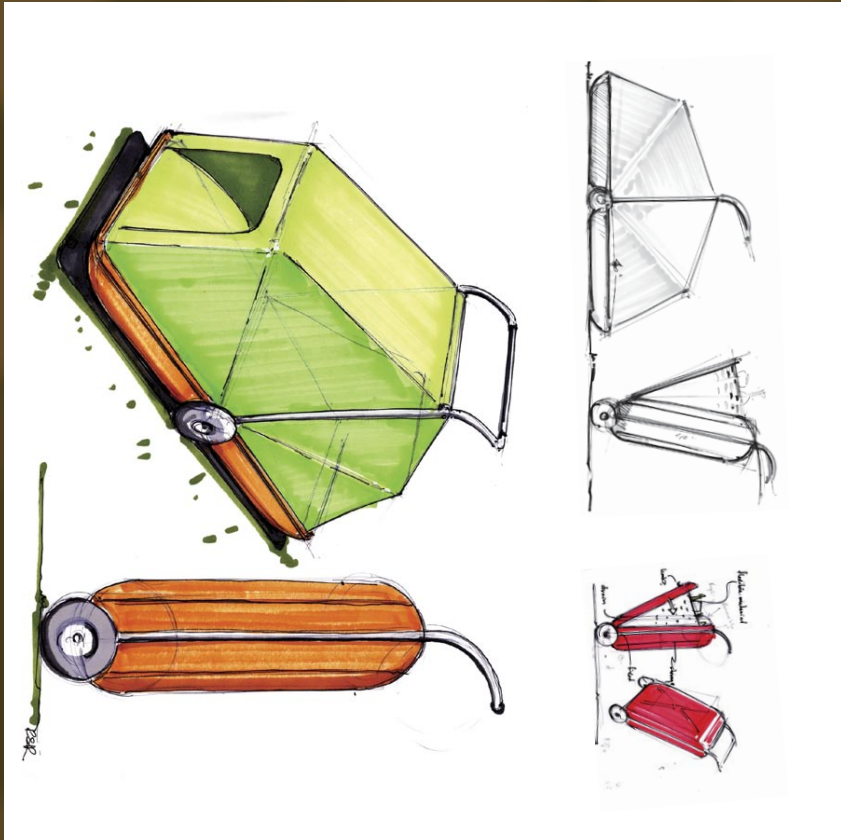
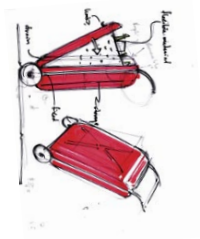
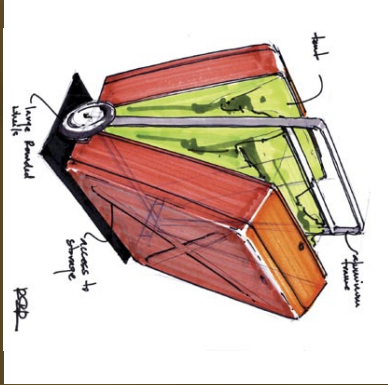
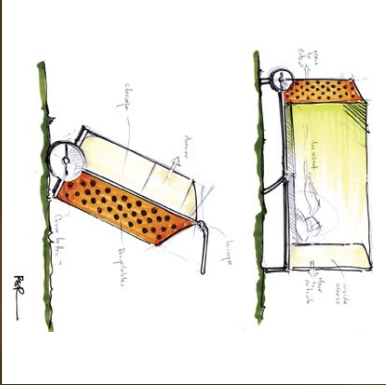


# Concept Development

concept 3  
peacock

This pull-behind concept was the cleanest and most elegant. Not unlike luggage, this shelter is the most mobile, and maneuverable. The sleeping surface and cover is set up in one motion, with no additional work required once the two sides are opened.

The shell is lightweight, durable, recyclable and easy to manufacture. The simplicity of the design results in fewer parts, and therefore easier assembly and cheaper production costs.





## Concept Development

Below: The folded model next to a scale model of a 5' tall person.

Right: Model opened, with outline of tent structure.

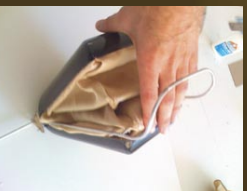
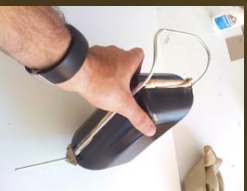


## Concept Refinement Phase 1

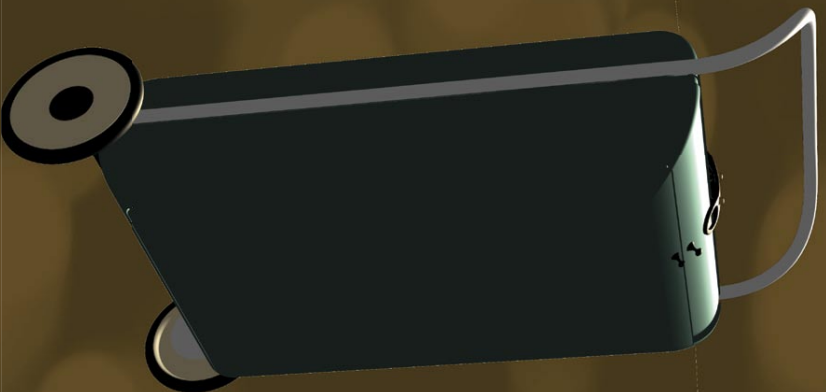
domus

I chose the Peacock concept for my final because of its simplicity, size, portability, and cost.

I created a more detailed model, using vacuum formed plastic for the shell, thicker, scale tubing for the frame, and cloth for the working sleeping area.



## Concept Refinement Phase 1



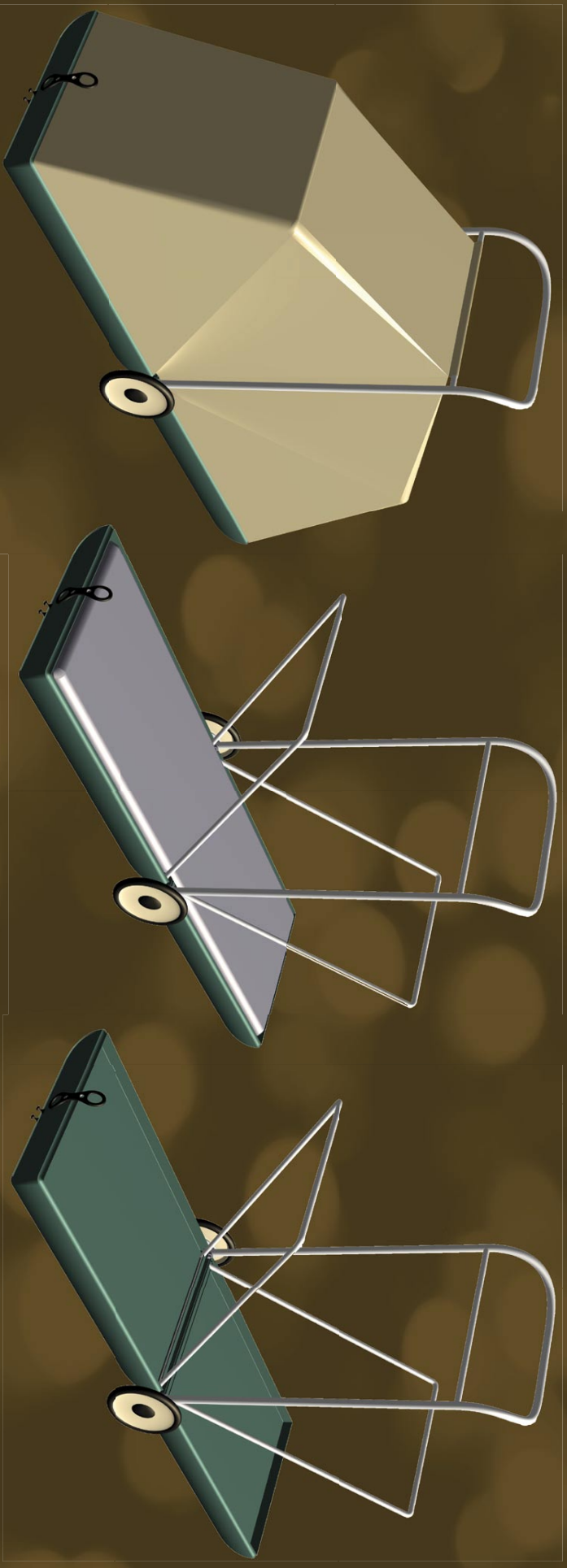
92



93



## Concept Refinement Phase 1



## Concept Refinement Phase 1

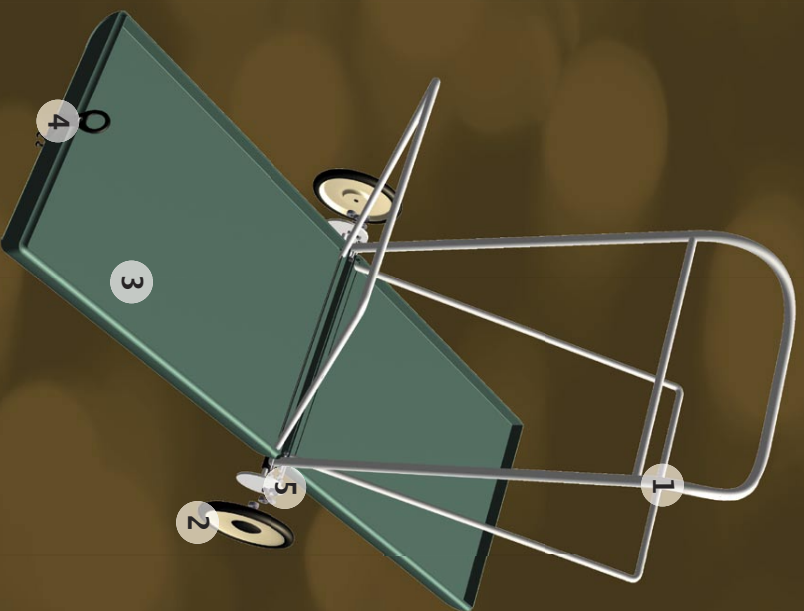


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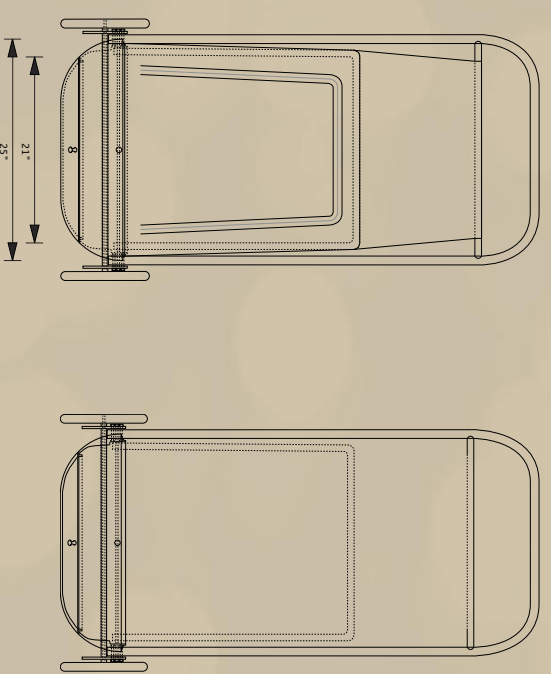
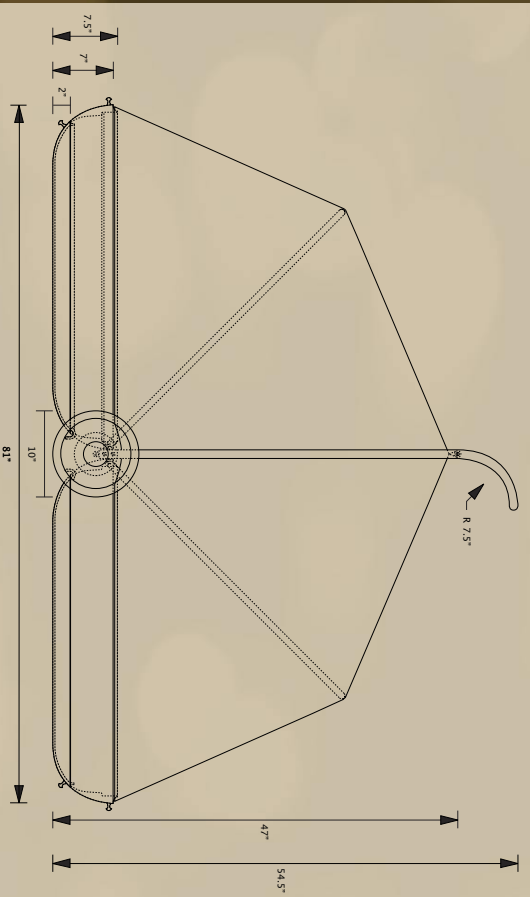
## Construction & Materials Phase 1

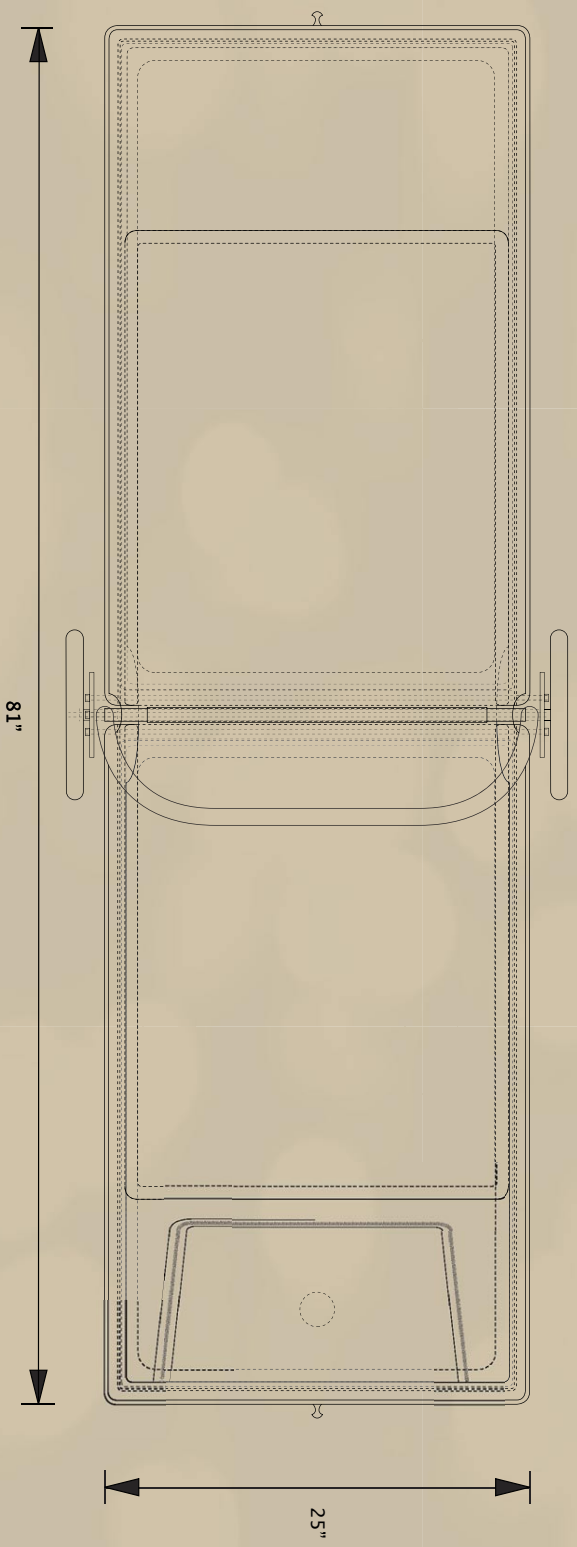


- 1 Aluminum tubing
- 2 10" garden wheels
- 3 Rotomolded polyethylene (bio-plastics once become more reliable)
- 4 Rubber latches
- 5 Steel hardware

Nylon tent shell - with Velcro connection







## Full Scale Model - Phase 1

The first full scale model was build from my CAD model , using fiberglass for the outer shell, and sleeping surface. I built the frame from conduit, and used a lightweight material to simulate nylon for the roof. I realized several problems with this model. First, the size was larger than I had expected. Second, it was quite heavy - it was only a study not using final materials, but I could tell that it was over-engineering for it's purpose.

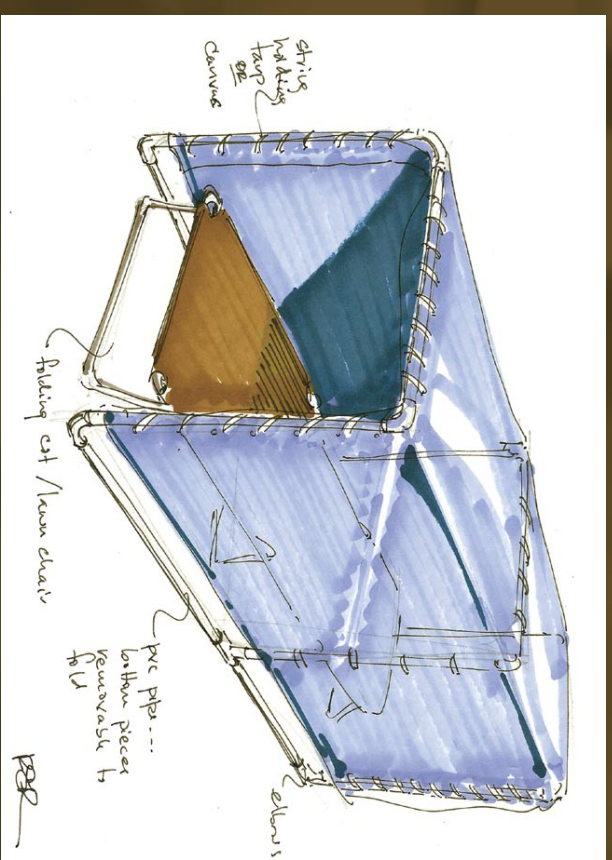
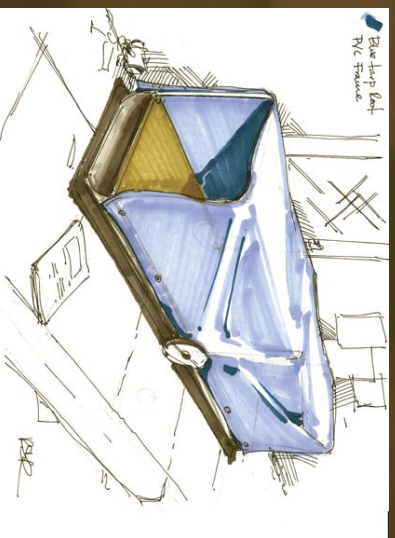
After discussing the project and model with many people, I decided to keep the basic design, but simplify it, eliminating the need for expensive processes such as injection molding. Ultimately, I wanted to make something that could be shipped and easily assembled by the user, with lightweight and durable materials.





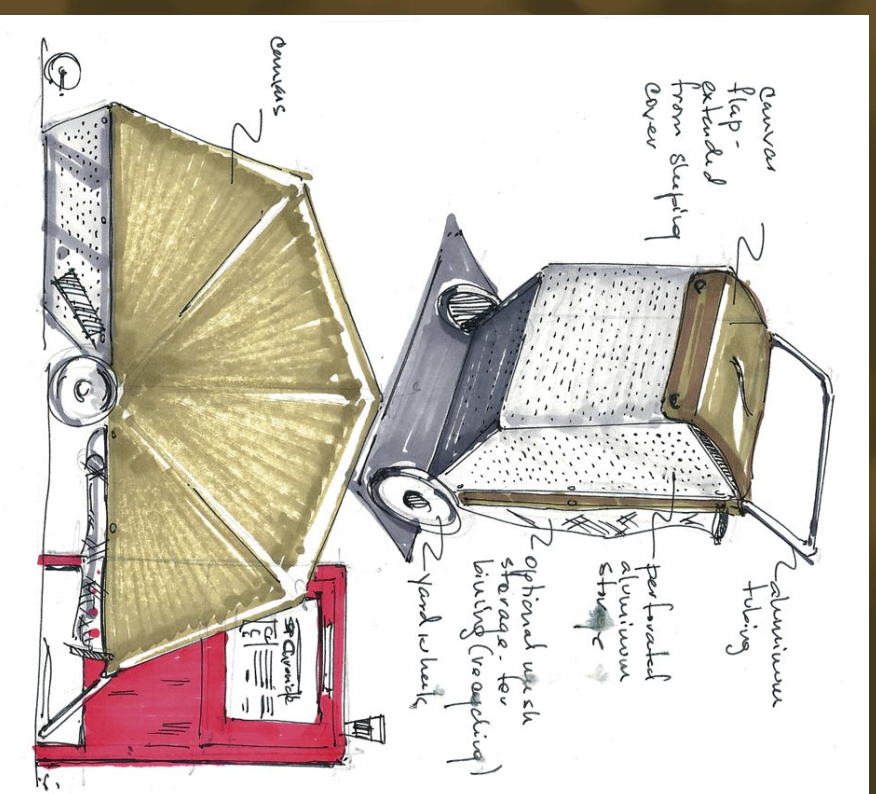
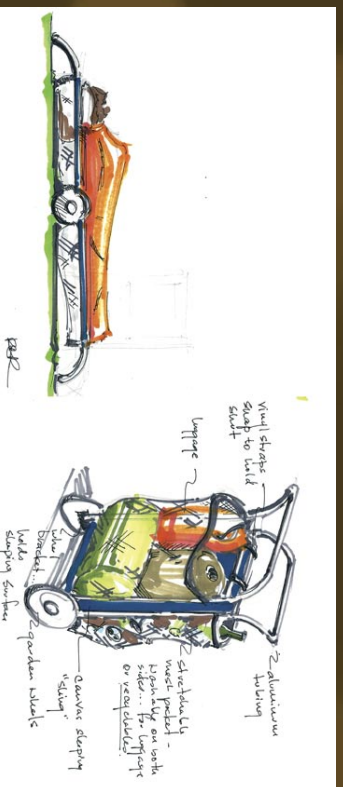
## Concept Refinement Phase 2

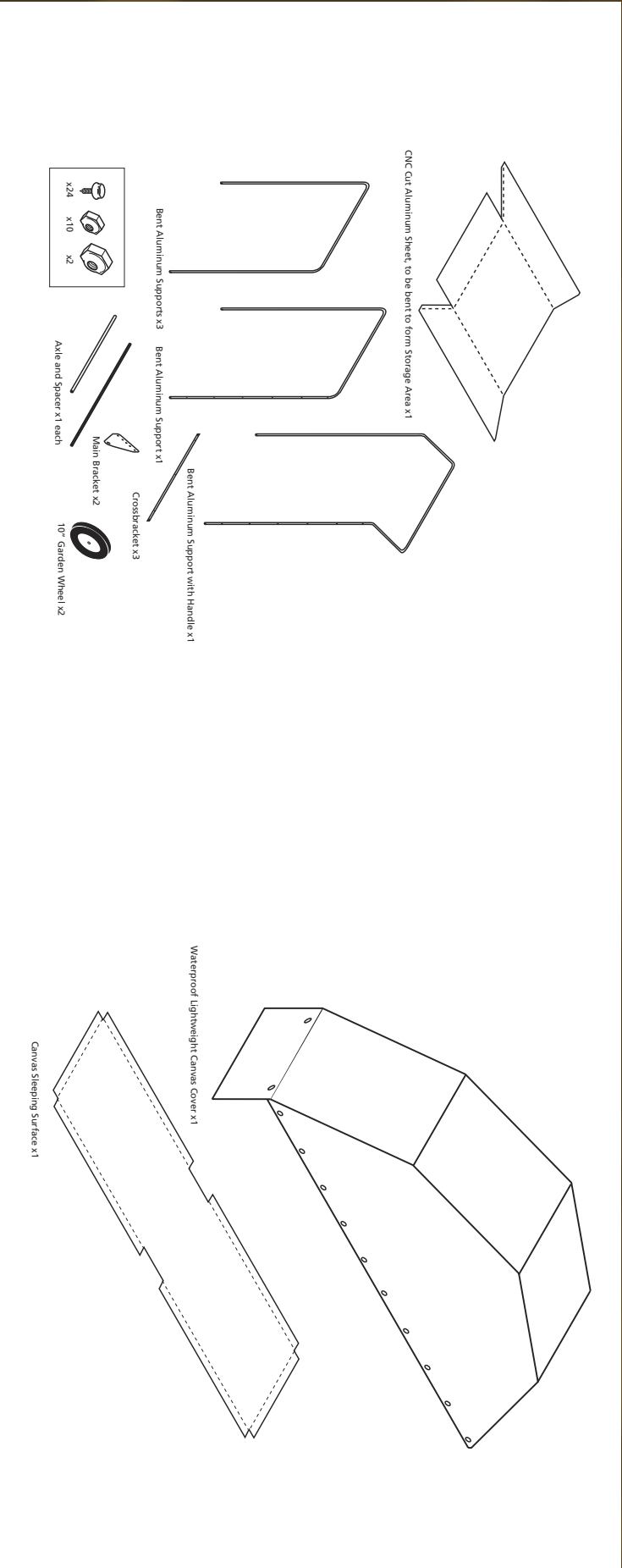
At this point I could have completely gone back to the drawing board. I toyed with the idea of making this project completely DIY. The idea of simply producing an instruction manual calling for inexpensive parts available at any hardware store was very tempting. The following designs could be easily built using PVC pipe, and a plastic tarp, or similar waterproof material.



## Concept Refinement Phase 2

Ultimately I decided to adapt my original design, but remove the plastic shell and sleeping surface. I still needed the sleeping surface to be elevated, so I decided to use stretched cloth, similar to a cot. The plastic shell had added a secure place to store belongings. With that gone, I considered a flexible net material for storage, but thought that it lacked durability, and by allowing people to see what was being stored there, would invite thieves to take what they want. I decided having a single aluminum storage area would keep weight down, would be easy to produce, and would keep belongings out of site. Although it's not lockable like the original, it provides ample space for sleeping bags, blankets, and some personal belongings. To eliminate cost, I did not include a lock, but a simple chain or bike lock would work.







## Final Model Construction

Once all of the parts of my final model were ready, I assembled it from start to finish at once, out of curiosity for how long it would take. Bending the storage unit was slightly more difficult than I intended, I could have gone with a thinner aluminum which would have made it easier - I wanted it to be able to be shipped flat. All in all, the total construction took just over an hour, which I don't think is bad at all. By keeping the number of parts to a minimum, the design not only ended up being more elegant, but much easier for a person unfamiliar with my project to put it together on their own.



Flat CNC cut aluminum sheet with folding perforations



Storage panel after hand bending into shape



Aluminum brackets for frame and axle



Sleeping top snapped into place over the frame



Sleeping surface, frame, storage, and axle assembled



Right: Completely assembled model folded up and ready for transport

## Final Model

Through much testing, the final model has proven very sturdy. The brackets, lightweight aluminum storage compartment and the aluminum tube structure have all held up very well. The cover has also held up well, and I think I would use the same materials for the production model, with the exception of the sleep surface. The material I used for sleeping was chosen because it could stretch, which I thought would make sleeping more comfortable, but in reality, it's too thin and flexible - I would chose a canvas next time, similar to what I used on the cover. The final wight is exactly 25 lbs, and it's size does make it slightly unweildy going up and down staircases, and traveling in a vehicle, although it will roll through a standard doorway without hitting the edges. Opening and closing it for sleeping or transport takes less than a minute.





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