



Monte Paulsen Investigates

Green Homes, Out of the Box

(A Tye Solutions Series, Originally Published on The Tye)



Shipping containers revolutionized the global economy, making trade possible on a scale never before seen. Now, these big steel boxes hold the potential to revolutionize urban living and design.

In this series, reporter Monte Paulsen details how these containers are being refashioned into affordable, green buildings in Europe and Asia and examines how they could be used to solve North America's housing problems as well.

This series is the first part of the larger *Green From The Ground Up* series, a project of the non-profit Tyee Solutions Society made possible through the support of the Vancity/Real Estate Foundation Green Building Grant Program. Support for this project does not necessarily imply endorsement of the findings or contents of these reports.

As he compiled research for the series, Monte met Linus Lam, the Executive Director of Architecture for Humanity Vancouver. The two decided to work together on a two-day event called *Quick-Homes*, which attracted nearly 100 participants, including City councilors, funders, architects, planners, non-profit housing managers, designers, and students. You can learn more about *Quick Homes* here: <http://thetyee.ca/Tyeenews/2010/04/14/Superchallenge/>

You can also view a video of the event here: <http://vimeo.com/11247497>.

This series was originally published on *The Tyee*, and is available at <http://thetyee.ca>. If you would like to republish it in whole or in part, please contact the Executive Director of Tyee Solutions Society, Michelle Hoar, at mhoar@thetyee.ca.



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Green Homes, Out of the Box

Green and Affordable Homes, Out of the Box.....	1
Is this Canada's Most Affordable Green Home?.....	5
Homeless Housing for Less.....	9
After the Fact: The City of Vancouver passes a motion on modular housing, July 2010.....	15

Monte Paulsen researched and wrote this series for the Tyee Solutions Society. It was published on *The Tyee* in April 2010

The entire series is available at
<http://thetyee.ca/News/2010/04/11/OutOfTheBox/>

Green and Affordable Homes, Out of the Box

Shipping containers hold the potential to revolutionize urban housing.

This series was originally published on April 12, 2010, on TheTyee.ca. The electronic version of the story is available at <http://thetyee.ca/News/2010/04/12/GreenAffordable/>



TO LEFT: City Centre Lofts is slated to become the first mid-rise to be built out of shipping containers in North America. It will be constructed using 50 per cent recycled material. The Salt Lake City building was designed by architect Adam Kalkin. The building's footprint is about the same size as a common 25- by 120-foot Vancouver Lot.

boxes that flow through the region's ports at the rate of more than two million a year --- are being refashioned into affordable green buildings across Europe and Asia.

And on Thursday evening, the Tyee Solutions Society will join with Architecture For Humanity Vancouver and the Design Foundation of British Columbia to kick-off the Quick Homes Superchallenge, a two-part charrette aimed at generating affordable housing concepts for public discussion.

The box that changed the world

The humble steel boxes in which goods are shipped, trained and trucked around the world touched off an economic "revolution," according to Mark Levinson, author of *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger*.

Levinson chronicles the 18 million big steel boxes that make globalization possible, flooding markets with low-cost consumer goods from China, filling cities with cut-rate department stores such as Wal-Mart, and felling wide swaths of the North American manufacturing sector and the high-paying jobs it provided.

Vancouver boasts both the "Greenest Neighbourhood in the World" --- the LEED certified Olympic Athlete's Village --- as well as the world's first LEED Platinum convention centre.

But the city that calls itself the "Green Capital" has shown surprisingly little interest in a rapidly emerging building technology that promises to become not only far more environmentally friendly but also significantly less expensive than the heavy concrete construction that has reshaped the city's skyline. Indeed, Canada's first modern home built this way stands not in the Terminal City, but across the straight in Victoria.

Over the next few days, The Tyee will report on how intermodal shipping containers --- those 40-foot steel

“In 1956, the world was full of small manufacturers selling locally,” Levinson writes, “by the end of the twentieth century, purely local markets for goods of any sort were few and far between.”

One of the world’s first purpose-built intermodal container ships set sail from North Vancouver in November of 1955. The Clifford J. Rodgers carried 600 containers to Skagway, Alaska, where they were loaded on to rail to be carried over the White Pass to the Yukon.

Today, Port Metro Vancouver is Canada’s busiest port. More than two million “twenty-foot equivalent units,” or TEUs, flow through every year, according to port records. (Containers come in five basic sizes. A standard 20-foot-long by 8-foot-wide container equals one TEU. A 40-foot container is two TEUs.)

The vast majority of containers arriving in Metro ports hail from China, followed by Japan and Korea. And most return to the nations that sent them. But almost 100,000 get left behind each year.

In 2009, for example, records show that a total of 1,122,849 TEUs entered Port Metro Vancouver, while only while 1,029,613 TEUs were shipped outbound. That’s a difference of 93,236 containers.

Likewise, in 2008, Metro ports took in 96,509 more TEUs than they sent away.

Those containers don’t all pile up in the Lower Mainland. Most leave the region via truck or rail car, and many of those ultimately leave Canada via a border crossing or another seaport. But North America’s longstanding imbalance of trade with China and other Asian exporters tends to create a backwash of surplus containers in places Vancouver and other port cities.

Greener than concrete, stronger than wood

Containers are built to stack nine high while carrying 60,000 pounds on a deck that’s pitching on the open ocean. They are built to survive decades of service in a marine environment, and, if kept painted, will last indefinitely as part of a building.

“These are just big steel boxes,” said Barry Naef, who directs the GreenCube Network and the Intermodal Steel Building Unit (ISBU) Association. Naef noted that these boxes present the opportunity to not merely recycle but creatively reuse what is arguably the most durable waste product of the globalization era. Stranded containers that are not repurposed tend to be melted down. As fuel costs rise, containers on the wrong side of the ocean can become worth more as scrap metal than the cost of shipping them back to China empty.

A typical 40-foot container represents about 8,000 pounds of steel, which can require about 8,000 kilowatt-hours of energy to melt and remanufacture. That’s about half of what a typical home uses in a year. As a result, buildings created from used shipping containers function like carbon reduction and long-term storage devices.

At the same time, containers tend to replace concrete in more urban settings, due to the metal boxes’ strength and easy stackability. And cement is far from green.

The manufacturing of cement is the largest source of carbon dioxide emissions after fossil fuel consumption, according to U.S. government statistics. A report by the World Business Council found that every ten pounds of cement releases nine pounds of carbon dioxide emission.

But according to Barry Naef, the biggest green advantage of shipping containers may be their strength.

“Their strength allows the structure to provide green roofs, green walls, solar hot water roofs, all without additional supports,” Naef said. “It’s hard to do these things on a wood-frame structure. “Concrete is great. But when you have to go spend so much to do a green roof, I don’t think it winds up getting built.”

Construction costs 25 per cent less

In port regions such as Vancouver, end-of-life shipping containers are often sold for as little as \$1,500 in the Lower Mainland, while pristine 40-foot “high cubes” -- which feature nine-and-a-half-foot ceilings

-- can fetch \$4,000. Either way, it's substantially less than the cost of building a similar box out of wood or concrete.

The cost to convert that box to a home varies widely.

Charities providing housing to Maquiladora workers in Mexico are able to convert used shipping containers into simple homes for about \$15,000 (excluding land costs). Those homes are small, but they come complete with doors, windows, a full bathroom and kitchen appliances for less money than most Canadians spend on a car.

Companies that provide container-based worker housing to the oil and mining industries sell heavily built pre-fab units for prices that start in the range of \$35,000 per container unit. Some of these are heavily insulated for arctic conditions. Others include generators and water-processing plants. (More on these units on Wednesday.)

Custom home builders report saving an average of about 25 per cent against what a comparable home would have cost to build, according to Naef. He said cost savings vary widely according to how many hurdles are thrown up by local zoning and building code officials.

"Local building codes are a real hurdle for some builders," Naef said.

"We need to do a much better job of educating zoning boards and building inspectors," he said. "Each building inspector seems to have a different reason why they wouldn't let someone build with shipping containers. Many objections are based on false assumptions."

For example, he noted that many local building codes still require studding out all the walls in order to comply with outdated zoning ordinances. "This unnecessary duplication reduces --- but still does not eliminate --- the cost effectiveness of container-based construction," Naef said.

New built form emerging in Europe and Asia

In dense cities such as Vancouver, however, the greatest cost savings and the most significant green advantages generally come down to the same thing: The less land a home requires, the better.

Containers are built to stack. And it has been through the creative assembly of stacks of containers -- coupled with the innovative ways of opening up the interiors -- that a new built form has begun to emerge in Europe and Asia. Here are a few examples:

Container City is a collection of London-area developments drawing on container techniques perfected by a company called Urban Space Management. The first project was built in East London, in 2001. The Container City projects include offices, retail shops, artists studios, a nursery, a youth centre, and a school as well as housing.

"This modular technology enables construction times and cost to be reduced by up to half that of traditional building techniques while remaining significantly more environmentally friendly," states Urban Space Management.

Keetwonen is the world's largest container housing project, as well as one of the simplest. The project is a student village built from 1,050 containers near Amsterdam city center.

Though only 320 square feet, each suite has separate sleeping and living rooms, a full kitchen and bath, large windows and a private balcony. The units are well insulated and served by a central heating system. The complex hosts cafes, shops, art studios and even mini-gyms.

And while some container projects strive to conceal the container's industrial essence, a Korean project, Platoon Kunsthalle, takes the opposite approach. The Seoul artists centre was created from 28 containers.

Excerpts from the Ensuing Discussion in the Tyee's Comment Section:

Contaminants in shipping containers

posted by "gwebster" on April 12, 2010

I have considered using a recycled shipping container to build a laneway house in my backyard, but I wonder about potential contamination issues. Have these containers been sprayed with insecticides or fungicides? What other chemicals might have been used in the goods originally shipped in these containers? I haven't seen any discussion about this yet.

Contaminants

posted by Monte Paulsen on April 12, 2010

Thanks for asking, gwebster. This was one of the interesting minor points that didn't make it into the final draft of this week's series.

Some nations (Australia, for example) require the plywood floors in shipping containers to be treated with pesticides. The idea is to keep pests from migrating in these boxes. As a result, many container floors contain pesticides.

Builders using existing containers resolve this issue in one of three ways: Some remove the old floors entirely; some put a barrier between the old plywood and the new floor; some use newer containers that have only made one or two trips and have never been treated.

invented in Vancouver

posted by "Lloyd Alter" on April 12, 2010

I am so happy that you got it right about the shipping container being invented in Vancouver and NOT by Malcolm Mclean as it says in the Box. Peter Hunter's book "The Magic Box" written in 1993 clearly shows that it was predated.

Haiti

posted by "Don_EC" on April 12, 2010

With so many 'surplus' containers in North America, since the Haiti earth quake, I have been wondering why donated containers -- even without improvements -- might not represent a potentially-more-useful temporary shelter than thousands of tents?

This article suggests more elaborate usage, and this could certainly be considered in the long run. But if you gave me an option of occupying a tent or having a container in which to set up a temporary home, I think I would go for the container. And considering the ingenuity of the Haitians, I expect that in short order, they would have done conversions to make them very habitable.

As well, I expect that they would be fairly earthquake proof, if located on level ground and not stacked.

As always

posted by "zalm" on April 12, 2010

The question is not "what to live in" but "where".

Is this Canada's Most Affordable Green Home?

How Victoria designer Keith Dewey transformed eight used shipping containers into an airy residence.

This series was originally published on April 13, 2010, on TheTyee.ca. The electronic version of the story is available at <http://thetyee.ca/News/2010/04/13/MostAffordable/>



TO LEFT: Zigloo Domestique is a custom home in Victoria, B.C. Architect Keith Dewey reused eight 20-foot-long shipping containers to create its frame. Open floor plans such as this can cost less to build using shipping containers than wood or concrete, because long steel beams are included in the price of the used container. Photo courtesy of Keith Dewey

One of Canada's most affordable green homes stands not in the swaggering "Green Capital" of Vancouver, but in B.C.'s actual capital, Victoria.

Designer Keith Dewey built his own home out of eight end-of-life shipping containers. In so doing, he saved five years worth of electricity and spared about 70 trees -- all while cutting the cost of his new home by roughly 28 per cent.

"Initially, everyone's perception is that steel containers must be cold, cramped and uninviting," Dewey said of the reaction to his custom home, pictured in the slide show above. "That perception dissipates as soon as they step inside."

Dewey, who will talk about his home this Thursday night at the Quick Homes Superchallenge, added, "I was trying to create a green house that was well

within the realm of feasibility for an average builder. So I didn't get too extreme with anything."

Victoria inspector supported the plan

"The idea of using shipping containers came to my attention back in 2000, when I saw a magazine cover about a project called Future Shack, which was developed in Australia," Dewey told The Tyee. "That really captivated my imagination."

The designer toyed with the concept over the next few years, and, "when the opportunity arose for us to design our own house, it was a natural development of the ideas that I'd conceptualized."

Dewey built the home he calls Zigloo Domestique in 2006. The 1,920-square-foot home is nestled into a small L-shaped lot in the Fernwood neighbourhood. The open-plan home rests on a typical residential foundation.

The City of Victoria's building inspector required Dewey to employ a structural engineer and a building envelope specialist, but otherwise treated the project like any other single-family residential home.

“We found ways to harmonize what is already known about the residential building industry with things that are already known about the shipping container industry,” Dewey said of his approach.

For example, he framed two-inch interior walls at two-foot centres, and sprayed foam insulation into the void.

“It ended up being closer to four inches of foam, because there’s a little bit of an air gap between the two-by-two wall and the steel, and then there’s the corrugated nature of the steel wall itself,” Dewey said. “We got R-28, which is well above the minimum requirement.”

He topped the house with a conventional wood-framed roof, and dry walled much of the interior -- leaving strategically placed sections of corrugated steel as accents.

The house carries a traditional mortgage.

“I was able to convince the mortgage and insurance companies of the fact that this is a steel frame building, which just happens to have steel cladding. Once they were able to categorize it that way, then it was not problem,” he said.

‘A natural resource of consumer society’

“The sustainability issue was important for me. In my mind, a sustainable concept is one that makes use of materials that have already served their purpose. So I went out looking for end-of-life containers... things that were between 12 and 26 years old,” Dewey said.

“These shipping containers, of course, we’ve got them all over the place. In a way they’ve become a natural resource of consumer society: everything comes to us in this box, but we have no use for the box now,” he said.

Dewey bought eight used shipping containers, each measuring 20 feet long by eight feet wide by 8.5 feet high. He paid between \$2,000 and \$2,400 per container.

“A lot of them had dents and dings. One even had a breach on the side,” he said. “By itemizing our inven-

tory, I was able to use those in areas where I would be cutting out portions of the wall.”

Thousands of old shipping containers like the ones Dewey bought are melted and recycled into new steel every year due to a variety of economic factors, including ocean-going insurance requirements, the high price paid for scrap metal, and North America’s ongoing trade imbalance with Asia.

By reusing -- rather than recycling -- most of the steel in those eight containers, Dewey saved something in the range of 50,000 kilowatt-hours of energy. That’s enough hydro to light his home from the day he moved in through sometime next year.

Dewey also saved a small forest. Though Zigloo Domestique makes extensive use of manufactured wood products such as paneling and cabinetry, it employs less raw framing timber than a wood-frame house.

“I figured that I saved 70 trees worth of wood by reusing the containers,” Dewey said.

The house has a concrete floor on the main level, which was poured atop a grid of hot water lines that provide radiant heat. The hot water is supplied by an on-demand (tankless) hot water heater.

“It’s a very efficiently heated house... by heating the basement and the main floor, the residual heat rises up the stairwell and flows through the remainder of the house,” Dewey said.

“It’s easy to cool, too. By strategically placing operable windows, we are able to get really nice summer breezes,” he added.

A custom home for a spec-house price

“My idea was to design a custom home, using sustainable materials, and do it for the same price they were building spec quality houses out in the low-cost subdivisions,” Dewey said.

In Victoria, spec homes run about \$150 per square foot, while custom homes average about double that.

In addition to the engineer and envelope specialist, Dewey contracted professionals for all the trade work

such as electrical, plumbing, drywall, painting, etc. The only cost he avoided was his own design fee.

“I didn’t cash in any favours on this one. I wanted to see what the costs really were,” he said.

“As it all turns out, we were able to do it for \$180 per square foot,” he said.

“I would easily stack this house up against any house out there for \$250 per square foot or more. So I’m assuming we saved in the realm of \$70 per square foot, mostly as a result of the reuse of these containers.”

That works out to a 28 per cent savings, which is consistent with the 25 per cent estimate provided by Barry Naef of the Intermodal Steel Building Unit (ISBU) Association.

Dewey acknowledged that he spent an inordinate amount of time and money working out solutions to specific design problems. The building envelope, for example, required considerable attention.

“When you put two containers together, there is this inevitable quarter-inch gap. So we had to develop a library of little details that could prevent water and drainage,” he said.

“I’m sure I will be able to do these things much more efficiently next time.”

Public perception remains a challenge

Dewey has several new container-based construction projects in the works. He said they all face the same challenges.

Perception is the first. The most common container buildings are the thousands of workers’ camps scattered across the booming Arab states, along with a small number of mining camps in remote locations.

“They look a bit like concentration camps... That does not help overcome the perception problem,” he said.

“That’s why I think the designer is a really important element. There are lots of engineers and fabricators

who can fabricate something low cost, easy to maintain, and durable. But if it’s not appealing, if it’s not an attractive thing for people to walk by, then it’s not going to work in an urban environment.”

Unrealistic expectations about cost are the second challenge.

“Nine times out of ten people are wanting something cheaper... People call me and they say, ‘Oh, it’s a box, and it’s cheap,’” he complained.

“There is money to be saved using shipping containers,” he said, “but the cost of the house is much more than the cost of the used container.”

Dewey does anticipate that once the form becomes more widely accepted, complete homes will be manufactured in low-wage regions and sold worldwide.

“We’re not quite there yet, but there is the potential for these homes to become extremely affordable in pre-fab manufacturing,” he said.

He designed a pre-fab workers housing complex called Modulute, which would have created 220 small, self-contained suites. Whistler approved the \$3 million project a couple years before the recent Winter Games, but the American vendor contracted to prefabricate the containers was unable to secure financing during the 2008 recession.

“It was an easily stackable configure that could have been removed and reinstalled somewhere else,” Dewey said. “It’s a bit of a shame. It would have been a real nice spotlight project during the Games.”

For the time being, he said, the container concept is catching on much more quickly in Europe. He cited Amsterdam’s Keetwonen project and London’s Container City developments as examples. (See yesterday’s slide show for pictures of those projects.)

“I guess there’s sort of a conservative mindset in North American culture,” Dewey chuckled. “We say, ‘I’ve got to see it to believe it. And I’m not going to look too hard to try to find it.’”

Excerpts from the Ensuing Discussion in the *Tyee's* Comment Section:

just wondering,

posted by "Takuan" on April 13, 2010

how do you fight fires in these?

It's the LAND people

posted by "cocean" on April 13, 2010

There's no shortage of novel ideas for extremely cheap and environmentally-friendly housing. That has never been the problem. The problem is largely municipal laws that restrict the size and type of a shelter, the amount of land to be associated with it and the materials used.

And there isn't so much a shortage of land as a shortage of political will that would free up land for the use of truly affordable housing, shelter that people even in the lowest decile of income could afford.

I have to admit, I like it

posted by "zalm" on April 13, 2010

This is the first article I've seen on this mode of adaptive reuse in building technologies that doesn't pretend to solve the affordability crisis. Land is still \$500,000 for a crappy lot in the Big Smoke, and will never be affordable even if you use cardboard boxes for houses. This is the signal failure of the market, and will require other interventions to conquer.

But for adaptive re-use, this is well thought out. For the insurance industry to cover it, it must have passed a number of inspections from proper engineers. And like most steel buildings, you can't cut too big a window into it without compromising the structural strength of the building, so that minimizes the heat loss - I'm surprised with R-28 average in the walls that it would need heating at all. Activities of daily living should keep that place comfortable on all but the below-0 days.

Of course, I'm a bit of a polar bear, as my wife points out....

How about the Eco-Sense project in Victoria?

posted by "dave49" on April 13, 2010

Look up Eco-sense.ca. It is a project of two Victoria residents, Ann and Gord Baird, to demonstrate a sustainable and affordable lifestyle. Their off-grid, seismically reinforced cob home, fully equipped, cost \$148.25 per square foot.

They pushed at a lot of policy issues and the latest challenge is the valuation by BCAA and their resulting tax bill. Under present law, they are paying more tax because they are equipped to be energy-independent (off-grid).

Info sheet at -- http://www.islandnet.com/~anngord/downloads/eco-sense-general_info_sheet_feb2010.pdf

To quote Ann and Gord, "If it isn't affordable... it isn't sustainable."

Homeless Housing for Less

Proposals to build free or low-cost homeless housing said to be 'stalled' by the province.

This series was originally published on April 14, 2010, on TheTye.ca. The electronic version of the story is available at <http://thetyee.ca/News/2010/04/14/HomelessHousing/>



TO LEFT: C-Bourne is working with developers in Saskatchewan who plan to erect prefabricated apartment buildings, then rent the suites for \$550 to \$700 a month. The apartments could include 480-square-foot bachelor suites such as the one pictured above. Each 20- by 24-foot unit would feature a large glass wall overlooking a 20-foot-long balcony.

But the Vancouver council's enthusiasm for the project was dampened by a distinct lack of interest from the province. Vancouver councilor Kerry Jang said, "This initiative just sort of stalled at the province."

This installment of *The Tye's* overview of container-based housing takes a look at the three proposals.

MC Quarters offered free housing

"Basically, we are asking the city to identify a site where we could do a pilot project. And we will provide the funding to develop that pilot project."

That's the extraordinary offer MC Quarters president Frank Lo told *The Tye* that he made to the city.

MC Quarters is a new company that is building prefabricated worker housing in China for export worldwide. It was founded by Lo, a longtime Vancouver resident and former shipping container broker. Lo figures he sold more than a quarter of a million shipping containers before launching MC Quarters.

Lo's concept involves adapting technology developed for refrigerated containers -- which are basically one steel box inside another, with foam insulation sand-

Last summer, Vancouver City Council invited several B.C.-based companies to submit ideas about how modular housing might be employed to house the homeless.

Three container-based proposals were among the five submitted. One firm offered to build a 43-suite supportive housing complex at no cost to taxpayers. Another offered to lease dormitory-style rooms for only \$350 a month. Yet another offered to build a similar project from scratch using local labour at its Coquitlam factory.

wicked between the walls -- for use as a structure in which super-insulated housing can be built.

MC Quarters sells construction camps to mining and oil companies. His company claims its container-based work camps are both more durable and more easily transported than the wood-frame modular structures sold by competitors such as Atco, Britco or Williams Scotsman. The B.C. company's first order is for a mining camp in the Yukon.

Lo's fledgling company also prepared by far the most detailed of all the container-based homeless housing plans submitted to the city.

MC Quarters hired architect Gordon MacKenzie to plan 43 units of supportive housing in a three-storey structure to be erected on a city-owned parking lot at the southwest corner of Princess Avenue and Powell Street. (See slide show at top of this page.)

In addition to 43 very small but fully self-contained suites, the proposed 13,755-square-foot building would include offices as well as a kitchen, common area, and laundry room.

MC Quarters' proposal pegged the construction cost at \$3.1 million. That's \$72,000 per suite. Lo said he can deliver those units six months from the date he receives an order.

BC Housing recently started construction on six of 14 promised new homeless housing buildings in Vancouver. The suites planned for those mid-rise buildings are almost twice as large as the room-sized units in the MC Quarters proposal. But the BC Housing suites are expected to cost taxpayers more than \$350,000 per unit.

About \$1.6 million of the projected construction costs for the MC Quarters building is for on-site construction by local trades, with the other half allotted for the purchase of 30 prefabricated container modules. Lo -- who has already hired an architect and built a prototype with his own money -- said he has offered to put up the cost of the containers, and help raise the cost of the local trade work.

"This is basically a semi-commercial project as far as we're concerned," Lo said. "We want to do something for the community."

C-Bourne offered to lease rooms for \$350 a month

Vancouver-based C-Bourne Structures is among MC Quarters' competitors.

Though C-Bourne's container housing proposal was neither as elaborate nor ultimately as generous as MC Quarters', it did include one particularly intriguing element: C-Bourne offered to lease the city however many units its needs for \$350 per month per unit.

"We lease these units all over the world," said C-Bourne partner Grant Powell, who joked that mining juniors "never actually buy anything."

C-Bourne is the Canadian distributor for Isopod modular housing. Isopod is a Canadian-owned company that has built thousands of units of container housing in places as far flung as Afghanistan, Dubai, Russia and Saudi Arabia. Isopod owns one-third interest in a proprietary factory near Shanghai.

C-Bourne submitted a conceptual proposal for dormitory-style housing that could be quickly erected on any city-owned lot, and then just as quickly disassembled when the real estate was needed for some other purpose.

"I basically said to the city, 'Tell us what type of units you want, how many you need, and where you want to put them. We'll engage engineers and architects and bring you a proposal,'" Powell told The Tyee.

Powell offered to lease the city as many dormitory-style rooms -- with a shared bathroom down the hall -- as the city wanted for \$350 a month per room. That's \$25 less than the \$375-a-month housing allowance the province provides welfare recipients.

After seven years, the city would be eligible to buy the rooms for \$10 each.

"These units are virtually indestructible. There's no drywall to mildew or wood to rot," Powell said. "If

the city didn't want to keep them, we would happily take them back."

C-Bourne is also working with developers in Saskatchewan who hope to erect pre-fabricated apartment buildings in communities near the tar sands.

"It's nuts out there," Powell said. "Some of those towns are facing an even worse housing shortage than Vancouver."

Plans for the prairie apartment buildings call for sprawling three-story walkups surrounded by parking lots. Most of the apartments would be 480-square-foot bachelor suites with full kitchens, bathrooms, Murphy beds and in-suite laundry facilities. Each 20- by 24-foot unit would feature a large glass wall overlooking a 20-foot-long balcony. (See a plan in the slide show at top of this page.)

Powell said C-Bourne can deliver and construct these instant apartment buildings in six months or less at a cost of about \$100 per square foot (excluding land). He said the developer aims to rent these apartments for between \$550 and \$700 a month.

"We can do two-bedrooms, three-bedrooms, anything," Powell said. "This is just the tip of the iceberg."

Mogil offered to build in Coquitlam

While less detailed than either of its competitors, the third proposal offered the prospect of bolstering the B.C. economy by building its entire complex in Coquitlam.

Mogil Modular Structures was founded by Phil Wang and is run by his son Nam Wang. The family is from Korea, where shipping containers are more frequently used as offices and small shops.

"Japan manufactured shipping containers to start off. But the cost was just too high, so it shifted to Korea," the younger Wang noted. "Then the same cycle happened again, and the production shifted to China."

Mogil builds 10-foot-wide containers that better lend themselves for use as construction components.

Because Mogil is focused on the North American market, its super-sized containers do not have to fit on container ships.

"That extra two feet makes a lot of difference," Wang said. "Shipping containers are nice. But the width is eight foot. It's just too narrow. By the time you do the walls, you put in a desk, and all you have is a little space as a corridor."

Mogil invested in all the tooling to make shipping containers from scratch, including massive metal-bending machines, precision plasma-cutting tables and a giant painting booth.

"We are pretty much self-contained," Wang said. "We bring in raw materials. We stamp, we bend, we produce our own components. We don't source out any work."

Mogil's camp business has slowed down considerably during the past couple years. "We had a good deal with the oilfields," Wang said, "but when that slowed down there just weren't any more orders."

So the family leapt at Vancouver's invitation to propose homeless housing. Mogil built a table-sized mockup intended to show off both its design and its local fabrication abilities.

"We built this miniature model just to show that we were really into it 100 per cent," Wang said. "We think these structures are ideal for housing. We would very much like to find a way to build some housing."

New vs. used containers

All three firms told The Tyee that the benefits of purpose-build containers outweigh the advantages of reusing end-of-life shipping containers.

"I am biased against used containers," said Lo. "I was in the shipping business. These containers go all over the world. You don't know what kind of freight they carry. And then you expect people to live in them?"

Lo added that new containers come from the factory with certificates that civil engineers can use to assess the load-bearing ability of the steel frame.

“You can’t even tell them what kind of steel an old container was made of,” Lo said. “If you have volume, your price difference on a per-unit basis is not large.”

Nam Wang agreed. He said that even without the volume discounts available to larger firms, the cost of cutting, re-flooring and repainting a used container can wind up costing as much a new container.

“It’s like you converting your hatchback into a pickup,” Wang said. “A lot more effort is going to go into it to convert it, and it’s not really made for that.”

Both the MC Quarters and C-Bourne units come fitted out with fixtures that would seem familiar to any North American.

“Remember that nearly everything we install in our homes is already made in China,” Powell observed. He said C-Bourne installs the same American Standard sinks and Bosch appliances available at the local Home Depot or Future Shop.

Powell added that the next generation of urban apartment buildings could just as easily include larger windows LED lighting, bamboo floors, solar hot water heating or other green features.

‘We are still doing this’

Another thing all three firms agreed upon was a sense of confusion about whether or not either the city or province will ever follow up on their proposals.

“Several months went by. We heard nothing. And then one day I got a call saying, ‘You’ve got to come pick up your stuff.’” Powell said.

In response to his questions, Powell said the city told him only that, “BC Housing was not going to give them any money for this.”

Wang recounted a similar experience.

“The whole idea with this was that we were going to give them a sweet deal so that we could help promote our product, right?” Powell said. “But if they don’t see it, they don’t see it.”

City Councilor Kerry Jang, whose Vision Vancouver party has promised to end street homelessness by 2015, acknowledged that the process was dropped.

“We welcomed these proposals in order to raise awareness about this type of housing,” Jang told The Tyee. “And then we referred them to BC Housing for consideration, because at the end of the day it’s BC Housing that has to decide whether or not these units would fit their needs,” Jang added.

“Nothing came of it after that. It just sort of stalled in provincial hands,” he said.

On his own initiative, Lo recently met with Housing Minister Rich Coleman.

“It’s a chicken and egg situation,” Lo said. The city won’t grant a site without some signal that the province will help fund the support services. And the province won’t commit to a project that doesn’t have a site.

Lo said he is neither discouraged nor dissuaded.

“We are still doing this. I think the key is to have patience. Because the whole idea is for the community to benefit.” Lo said. “I believe that it will work.”

Excerpts from the Ensuing Discussion in the Tyee's Comment Section:

is it best to keep the

posted by "frank2" on April 14, 2010

is it best to keep the homeless housed on the streets and in shelters -- rather than allowing some to try affordable full-time accommodations? Why not try some new options? We might learn something. Maybe even find low cost ways of dealing with the problem.

Great idea!

posted by "greengreen" on April 14, 2010

I think this is fantastic! I would live in any of the structures shown. Really, we have people living on the streets because the city and province can't coordinate, get their shit together, and solve the problem! How absolutely pathetic! When the roof on BC Place got a slight tear last year, it took no time at all to come up with a solution. Cost was no problem. When Falcon couldn't get a taxi, f---, there was a bill of rights for passengers--problem solved immediately.

The homeless problem has been going on for at least 15 years and will be with us for the foreseeable future. These accounts have shown a very workable, affordable solution. Stop the bullshit--get on with it.

Empowering People

posted by "jim1966" on April 18, 2010

I don't think that the BC Liberals are listening. How come our society values \$350.00 per month instead of the value of everyone's lives?. I live in a BC Housing building. I am lucky because I had a social worker who gave a crap and a doctor that did not want me to die on the streets. There are always 2 sides to an issue and this is one of them. We all want people to be safe, fed and have a quality of life that Canadians have come to enjoy. Problem is though is our "view" of the poor, the addicted and the mentally ill. How can we build or refurbish anything when the taxpayer knows that within a few short years it all be trashed or wrecked anyways. I had to prove that I was worth the effort and take some responsibility for my own

life. Then I got help. More importantly people have got to want to change and that is not always that easy to do. The second part of this is our current government. I have been saying this for a very long time and that's British Columbia's Social Services are not able to handle the real human deficit. If it could we would have a system in place that really works 99% of the time. Because of my disability I was lucky enough to get PWD and CPPD . I am one of those people who our society considers "The Deserving Poor", as opposed to the "Undeserving Poor", this is how our safety net really works, hence the various categories from social services, IE: Expected To Work, \$610.00, PPMB (Or Level 1) \$667.00 and PWD \$906.00 per month. These are the real numbers for a month. I would like to see this entire ministry do a complete overhaul of it's own policies etc. I can also tell you this, I will not be voting for the BC Liberals in the next election. In my case a graduated program worked really well. Could we not try this out in the future. We would have a much much smaller homeless population and a lot of people could take there own lives back?

After the Fact: The City of Vancouver passes a motion on modular housing, July 2010



MOTION ON NOTICE

2. **Modular Housing**

MOVER: Councillor Kerry Jang

SECONDER: Councillor Raymond Louie

WHEREAS:

1. The March 2010 City of Vancouver homelessness count demonstrated a growing number of homeless individuals (9% increase over the last 2 years);
2. The March 2010 count also demonstrated that despite the increase in homeless individuals, there was a 50% decrease since March 2008 in the number of homeless individuals actually sleeping rough in the street, attributable to the additional shelter capacity associated with the HEAT and 2010 COV Winter Strategy initiatives
3. The Mayor's stated goal is to end street homelessness by 2015;
4. The city is strategizing with its partners to optimize and expedite the availability of both permanent and immediate housing options to move as quickly as possible on this goal;
5. In addition to street homelessness there is also insufficient affordable rental housing in the City, with 39% of renters paying more than 30% of their income on housing;
6. There are a number of organizations who have approached the City to offer the opportunity of piloting modular housing opportunities to enable expedited and flexible housing alternatives on city land while new permanent stock is being built;

THEREFORE BE IT RESOLVED THAT

1. Council direct the City Manager to undertake an expression of interest (EOI) to ascertain the range of possibilities and partnerships available to pursue an initiative involving modular housing options, using city and private resources as an enabler, to address unmet housing need while sufficient permanent housing stock is being built.
2. The City Manager return to Council with a report on the results of the EOI, and with further direction from Council, proceed with a formal RFP for a modular housing initiative.

* * * * *

The following motion was passed during the City Council meeting on July 20, 2010. More information is available at <http://vancouver.ca/ctyclerk/cclerk/20100720/regu20100720ag.htm>