



REVIEW ARTICLE

A review of tiny houses in North America: Market demand

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Abstract: The history, status quo, and prospect of tiny houses in North America were reviewed. The market demand for tiny houses in North America was analyzed according to the needs in various market segments, such as shelters for low-income and homeless people, recreational housing for vacationers, and the restoration and reconstruction after disasters. This study also discussed tiny housing communities for retirees, tourism companies offering tiny housing accommodation, and government-sponsored tiny housing projects for post-disaster reconstruction. Throughout years of promotion by tiny house enthusiasts, medium advocates, and construction practitioners, more and more people have come to realize the advantages of the tiny houses made of wood, such as energy conservation, low carbon footprint, and sustainable development. In summary, the market for tiny house in North America is in a stage of rapid development.

Keywords: Tiny houses; North America; Wood framed; Market demand

1 Introduction

There is still not a clear academic definition of tiny houses. The Encyclopedia Britannica defines a tiny house as houses that are typically smaller than 37 m² (400 ft²) and are often on wheels. The common types of tiny houses are light wood frame tiny houses and container tiny houses. Some of them are built on a mobile basement like a trailer, and the others are constructed on a foundation. In recent years, tiny houses have become more and more popular around the world, representing a solution for people who want to return to a simple life, and playing an important role in solving the problem of homelessness and reducing the housing expenditure pressure of low-income people. The popularity of tiny houses began in the United States in the late 20th century, which was discussed in the book “The Not So Big House” written by American architect Sarah Susanka, suggesting the beginning of such a movement. However, the spiritual origin of this movement can be traced back to the romanticism of Thoreau and Emerson in the 19th century, and to the modern design concept of “less is more” proposed by Ludwig Mies van der Rohe in the early 20th century [1,2]. The 2008 subprime mortgage crisis crashed people’s finances; thus, many of them were not able to afford large housing expenditures. As a result, comparatively affordable, ecologically friendly houses, such as tiny houses, became their choice.

Up to 2019, North America (mainly the United States and Canada) witnessed a number of enterprises specializing in the construction of tiny houses (Fig. 1 is a photo of a wood framed tiny house by Modern Tiny Living, LLC.), and a number of governmental and private organizations have participated in the formation of a series of tiny house communities. However, the promotion of tiny



houses was not without any resistance. The size and structure of tiny houses conflict with the building codes and zoning regulations in many parts of North America, leading to concerns of many local governments when approving such projects. In addition, many tiny house communities are poorly managed and tend to become shantytowns and slums. These factors often lead tiny house projects to trigger nimbyism in surrounding communities. This paper mainly reviews the current market situation of tiny houses in the United States and Canada.



Fig. 1. Exterior and interior of a wood framed tiny house fabricated by Modern Tiny Living, LLC.

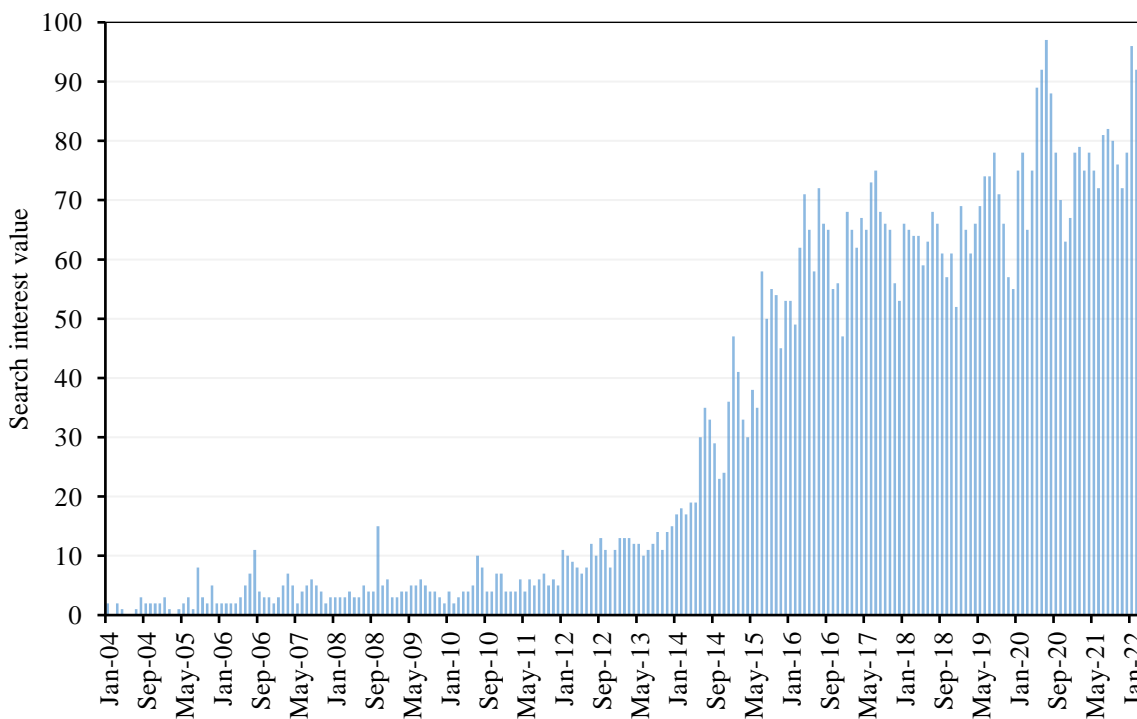


Fig. 2. Google trend search for “tiny house” between 2004 and 2022

In North America, tiny houses are now popular not only among the middle class as a simpler and sustainable way of life, but also provide new solutions to a series of housing problems, such as providing temporary or long-term housing for homeless people [3,4], mitigating the pressure of housing expenditure for low-income people, providing better housing options for long-term travelers [5], building resorts composed of tiny houses in tourist attractions, and providing temporary shelters for post-disaster relief and military operations. Fig. 2 is the search interest value of the words “tiny house” in the world from 2004 to 2022. The meaning of search interest value in google trends is as follows: “numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as

popular. A score of 0 means there was not enough data for this term”. Fig. 3 is the hot search value of regions in the world, which is defined in google trends as “See in which location your term was most popular during the specified time frame. Values are calculated on a scale from 0 to 100, where 100 is the location with the most popularity as a fraction of total searches in that location, a value of 50 indicates a location which is half as popular. A value of 0 indicates a location where there was not enough data for this term”. The data of Google trends in Figs. 2 and 3 illustrate that the search interest value of tiny houses has increased rapidly since 2014; and the United States and Canada ranked second and third among the countries and regions with the highest search popularity of tiny house in the world. The first-ranked country is New Zealand; however, it is far smaller than the United States and Canada in terms of the population and economy. A higher value denotes a higher proportion among all counted queries, not a higher absolute query count. Hence, it can be observed that North America is one of the most important markets for tiny houses in the world.

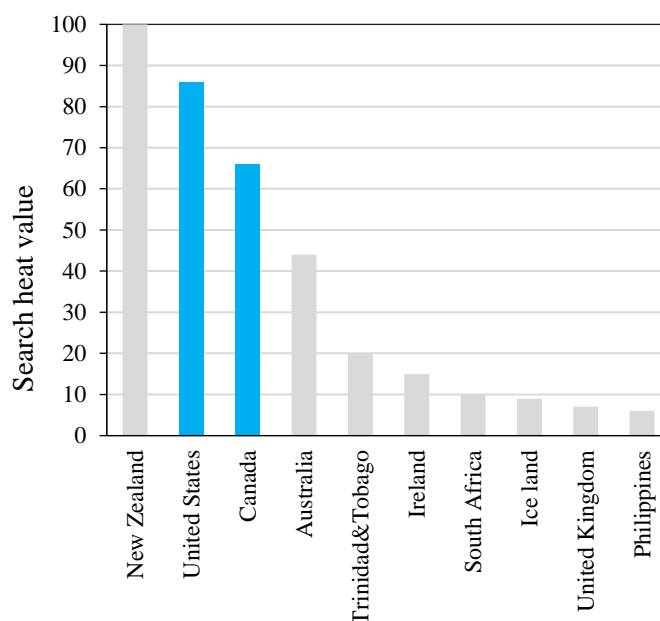


Fig. 3. Google trend search for “tiny house” by region between January 1, 2004, and December 7, 2022

2 Market demand of tiny house for upper middle-class people

The micro-housing movement initially flourished in tandem with the middle-class rethink about its increasingly materialistic lifestyle. According to the 2017 American housing survey (AHS), the median housing area in the United States is 65 m² (700 ft²) to 139 m² (1500 ft²) for a single person. Based on another 2017 survey by Point2Homes, the average size of homes in the United States and Canada ranges from 166 m² (1792 ft²) to 177 m² (1901 ft²), respectively, ranking second and third after Australia. It is particularly noteworthy in this survey that many Canadians expressed a preference for smaller housing, with the expected housing area of 93 to 139 m² (1000 to 1500 ft²) even smaller than the current average housing area [6]. In recent years, as people’s understanding of a green and eco-friendly ways of life deepens, more and more people realize that larger housing means higher energy consumption and environmental burden, as well as the accompanying economic burden. The pursuit of smaller and more reasonable housing space became the first step for many people to change their lifestyle; and many architects and media also played an active role in this process. *Little House on a Small Planet*, by Salomon and Valdez (2006), and *Put Your Life on a Diet*, a 2008 memoir by Johnson (2008), both promote the virtues of smaller housing. *Tiny House Nation*, a TV show launched by A+E Networks in 2014, also promoted the movement by showing a number of well-designed tiny houses under 28 m² (300 ft²).

3 Market demand of tiny house for homeless and low-income people

3.1 Homelessness and the status of low-income people in the United States and Canada

Small house movement arose in the desire of the middle-class to return to a simple life. While with the development of the small house movement, it was found that the tiny houses featuring low cost, compact size, and structural simplicity are suitable for homeless and low-income people to find accommodations in a fast, economical manner. According to the report “State of the Nation’s Housing 2020” released by Harvard University, 30 percent of American households (37.1 million) were “cost-burdened” in 2019, suggesting that they spent over 30 percent of their income on housing, and this disproportionately affected low-income households. In Detroit, Michigan, USA, for example, Cass Community Social Services is building 25 tiny homes on individual lots that will serve as low-income housing. The residents who rent these homes more than seven years are eligible to own their properties. Over the past decade, political activists, religious groups, and many self-organized tent city organizations have used tiny houses as an effective tool to address the problem of homelessness and improve the quality of life of low-income people. Even in economically advanced North America, there are still a substantial number of homeless people in the society. Fig. 4 shows that the number of homeless people in the United States reached 647,258 in January 2007. The number declined in recent years, but it has remained around 550,000 in the past three years, among which nearly 200,000 people failed to spend the night in shelters [7]. For now, shelters in the United States are still mainly in the form of dormitories, single resident only (SRO) hotels, and motels. However, there are some obvious shortcomings in this regard, which are primarily reflected in the following aspects: (1) the dwellers must leave the shelters in the morning and come back late with a minimal sense of settlement; (2) the lack of private space and facilities for cooking makes it difficult to ensure the health of homeless people; and (3) the lack of safe private storage space makes homeless people have to carry important things with them at all times. Homelessness is usually defined by a lack of privacy, permanence, and hope; the homeless shelter does not change this situation. Therefore, the current shelter system cannot fundamentally resolve the problem of homelessness [8].

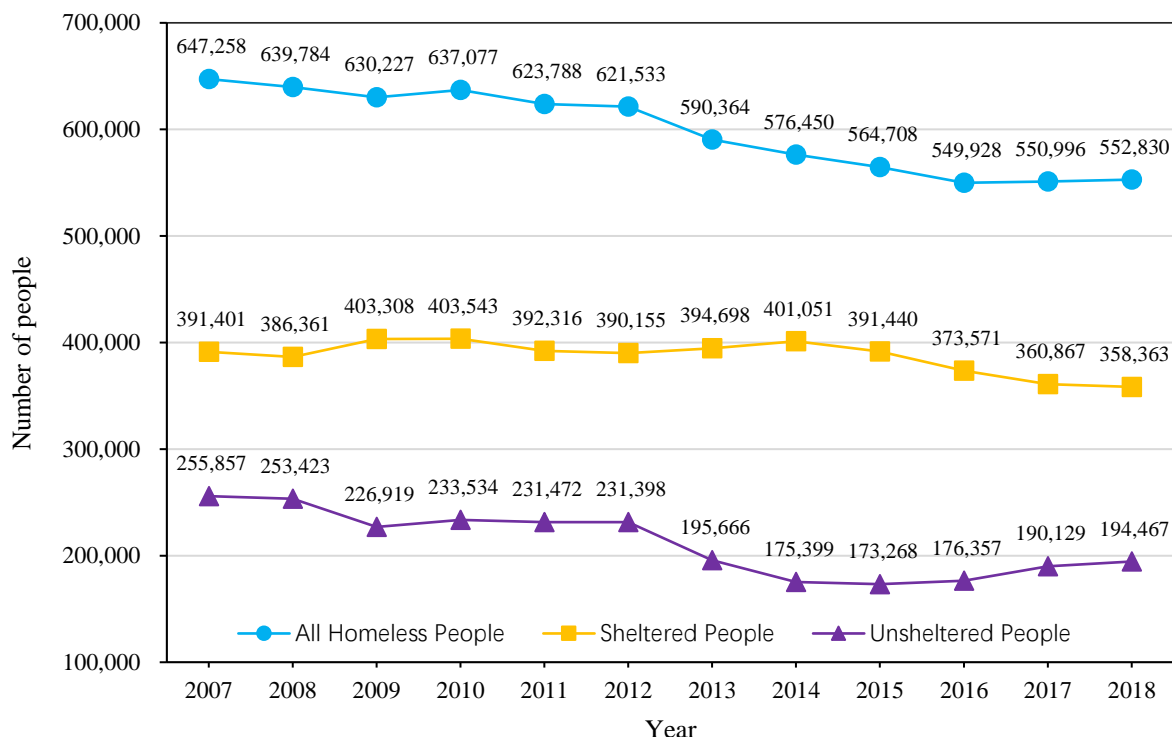


Fig. 4. Number of people experiencing homelessness in January in the United States [7]

According to the data from the 2016 Canada Homeless Situation Report in Fig. 5 [9], the number of homeless people in Canada was between 150,000 and 300,000 over the years and in 2016, there were about 235,000 homeless people in Canada. This report also noted that the prioritization of providing housing to homeless people had been widely proven to be effective to help them recover from homelessness and reintegrate into society at the forefront of the entire homeless assistance system.



Fig. 5. The data of homeless people in 2016 in Canada [9]

Tiny houses came onto the stage, which could be a better solution to homelessness in light of the experience from people and organizations that could provide tiny houses for homeless people. Providing a stable, private place to live should be the first step in helping them because an independent house can give homeless people back their dignity and self-confidence, which can help them re-enter school or find a job. Based on a survey by the United States Interagency Council on homelessness, assistance to chronic homelessness can save the government millions of dollars every year in health care costs by reducing emergency room use and hospital time. In addition, providing permanent housing for the chronically homeless reduces legal costs by scaling down the number of offences committed by the homeless, including trespassing, public urination, loitering, begging and public drinking. Housing first turns out to be very effective as a planning model.

Low-income people can also use tiny houses as a new housing option, according to the latest Housing Trends and Affordability released by RBC Economics Research, 51.9% share of a household income would need to cover the property ownership costs in Canada in the fourth quarter of 2018 [10]. This means that housing costs are still high in many parts of this country, and housing costs for low-income people will be obviously overwhelming to them. Based on the statistics of Canada's 2017 survey data, according to after-tax income standards, low-income people in Canada account for 12.7% of the population, approximately 4,570,000 people. People like those under 18 years in female lone-parent families and non-elderly persons not in an economic family usually represent the highest proportion of low-income people. For example, in 2017, 44.8% of persons under 18 years in female lone-parent families, and 30.0% of non-elderly persons not in an economic family were low-income people in the Province of New Brunswick, Canada [11]. It can be seen that single people who do not live in an economic family, especially single young women, will be an important potential customer group for tiny houses.

3.2 The development status of tiny house communities in the United States and Canada

On the positive side, many tiny houses communities have emerged in the United States and Canada in recent years to help homeless people and low-income persons. Table 1 shows the information about some tiny house communities currently established in the United States that serve the homeless and low-income populations. Established in Portland, Oregon in 2005, Dignity Village is one of the earliest tiny house communities in North America (Fig. 6). There are 43 tiny houses built from recycled materials in Dignity Village. The annual operating cost is about \$28,000, which is mainly supported by residents' monthly rent of \$35, income from micro-enterprises and donations [12]. The Quixote Community in Olympia, Washington (Fig. 7), not far from the Dignity Village has 30 tiny houses of 13 m² (144 ft²), each costing \$18,000, funded by state funds, community development grants, and donations from local organizations and individuals. The community consists of a shared kitchen, living room, shower room, laundry facilities, and a vegetable plot [13]. Compared with the tiny houses in Dignity Village, the ones in Quixote Community were designed in a unified and professional way, which costs much more than those in Dignity Village. However, they were easy to be accepted by surrounding residents, and the supporting service facilities are better. One of the largest tiny house

communities in the United States was built by a charity for the homeless in Austin, Texas, called Mobile Loaves & Fishes and this community covers 27 acres with 120 tiny houses and 100 recreational vehicles (RVs) spots (Fig. 8). The community has places such as worship, medical facilities, and gardens. The rents range from \$200 to \$350 per month.

Table 1. Main information of tiny houses communities in the United States

Project	City	Time	House Number	House Area/m ² (ft ²)	Costs/\$(USD)
Dignity Village	Portland, OR	2005	43	-	-
Occupy Madison	Madison, WI	2012	10	9 (98)	16,000
Quixote Community	Olympia, WA	2013	30	13 (144)	18,000
Second Wind Cottages	Newfield, NY	2013	12	30 (320)	15,000
Mobile Loaves & Fishes	Austin, TX	2015	120	-	-
MYTHPLA	Los-Angeles, CA	2015	40	5 (50)	2,500
Othello Village	Seattle, WA	2016	28	9 (96)	2,200
CASS Community	Detroit, MI	2016	25	23-37 (250-400)	-
CitySquare	Dallas, TX	2017	50	37 (400)	-
A Tiny Home for Good	Syracuse, NY	2017	11	28 (300)	28,500



Fig. 6. Dignity Village [12]



Fig. 7. Quixote Community [13]



Fig. 8. Layout of MLF Community [12]

Some municipal governments are also getting actively involved in building such tiny houses communities. Othello Village in Seattle is one of seven tiny house communities managed by the Seattle low-income housing association (LIHA) and the City of Seattle provides \$160,000 yearly to the community, mainly used for water, garbage disposal and on-site counselling [14].

Currently, many American universities are also working on tiny houses projects for the homeless. For example, in 2019, the students at Norwich University in Vermont completed a tiny house project (called Lift House) for the homeless and mentally sick people. The project was a collaboration between Norwich University students, who built the houses; the Department of Mental Health, which provided housing vouchers for the occupant; Downstreet Housing and Development, which created affordable housing projects; and Barre property developer Thomas Lauzon, who provided the land on Brook Street in Barre where the houses would be placed. Additional support came from the Vermont Housing and Conservation Board and TD Bank, which recently offered Norwich University \$200,000 for its architectural affordable-home building program [15]. Around the same time, students at Oklahoma State University in Oklahoma, USA, and the metro technology center helped a small family community build homes for living alone teenagers. The first three homes had been completed, and the community would eventually have 85 tiny houses to help homeless teens, with the first phase of 12 tiny houses completed in 2020 [16].

Canada's first tiny houses community for the homeless is in Calgary, Alberta, targeting homeless veterans, called Homes for Heroes (Fig. 9). This community consists of 18 tiny houses, each of them has a size of 26 m² (275 ft²), including a kitchen, a bathroom and a living room that can be turned into a bedroom with a folding bed. This kind of community gives Canadian veterans a sense of belonging and help them survive homelessness. With an estimated 5,000 to 7,000 homeless veterans in Canada, David Howard, President of the Homes for Heroes foundation, wants to build more than two tiny houses communities in every major city, each with a budget of about \$2.5 million [17]. A second tiny houses community was planned to complete in Edmonton, Canada, in 2019. Bluegrass village in Terrace, British Columbia, Canada, is a community with 30 tiny houses ranging in size from 19-46 m² (200-500ft²), each of which is for sell at about \$46,000 or for rent at \$795 per month [18]. The Blood Ties Four Directions Centre in Whitehorse, Yukon, Canada, also has a small community of tiny houses, called the Steve Cardiff Tiny House Community. This community has five tiny houses of each in size of 22 m² (240 ft²), designed for people experiencing homelessness, poverty, or health issues [19].



Fig. 9. Community Concept Plan of Homes for Heroes [17]

4 Market demand for travelling housing

In North America, tiny house hotels are becoming increasingly popular as a new option of vacation. Table 2 lists some information pertaining to tiny hotels in the United States and Canada.

Table 2. The daily prices of tiny house hotels in North America

Company	Location	Price/ \$ (CAD)
Airbnb	Atlanta, GA	107
Airbnb	Nashville, TN	113
Airbnb	Vancouver, BC	152
Canoe Bay ESCAPE Village	Rice Lake, WI	246
Canoe Bay ESCAPE Village	Rice Lake, WI	296
Canoe Bay ESCAPE Village	Rice Lake, WI	372
Getaway	New York, NY	238
Getaway	Los Angeles, CA	238
Getaway	Portland, OR	238
Getaway	Washington, DC	238
Getaway	Boston, MA	238
Jackson Hole cabin	Wilson, WY	318
Jackson Hole cabin	Wilson, WY	393
Jackson Hole cabin	Wilson, WY	605
Jackson Hole cabin	Wilson, WY	781
Live A Little Chatt	Rising Fawn, GA	175
Live A Little Chatt	Rising Fawn, GA	200
Mt. Hood Tiny House village	Portland, OR	175
Mt. Hood Tiny House village	Portland, OR	187

Getaway is a tiny house booking site to help Americans escape the bustle of their city life by offering nearby tiny houses. It currently serves New York, Los Angeles, Washington, Boston, Atlanta, and Dallas, and the daily rent is around \$110. There are many companies of this kind, like Mt. Hood Village Campground near Portland (Fig. 11), which offers five tiny houses of different sizes built by Tumbleweed Tiny House Company for \$139 per day as vacation cabins and Live a Little Chatt Company offers three types of tiny house hotels for around \$200 per night.



Fig. 10. Tiny house in Fireside Resort [20]



Fig. 11. Tiny house of Mt. Hood Village Campground [20]

Canoe Bay ESCAPE Village in Rice Lake, Wisconsin, USA (Fig. 12), is one of the largest tiny house resorts, in the vicinity of the west of Canoe Bay on over 100 acres of diverse rolling landscape. There are two private lakes on the property, Mallard Lake and Lost Lake, along with multiple wetlands full of wildlife. The natural setting is spectacular, with each tiny house carefully selected for its location and three types of tiny houses available for a rent between \$195 and \$295 per night. Visitors can also buy these tiny houses if they like [20]. Recently, a growing number of people think that living in tiny house hotels is a more sustainable way for traveling, where visitors can consume less energy and produce less waste than traditional hotels [21].

By sorting out the prices of 24 tiny house hotels in Table. 2, the proportion of the number of tiny house hotels in different ranges was acquired (Fig. 13). As Fig. 13 illustrates, nearly 80% of the tiny house hotels in North America cost between \$100 and \$300 while only 8% of the low-cost tiny house hotels cost less than \$100 and 13% of the high-end micro-housing hotels cost more than \$300. It can be

viewed that the present tiny house hotel market is mainly for the middle class. Additionally, the upper-middle class people in the relatively high latitudes of North America prefer to go to the warm south for a long vacation in winter to avoid the cold weather. Tiny houses, therefore, become a good option. It can be a mobile tiny house, or it can be a stationary one in a long-term resort. This would be a more economical model in the long run than that spending on a hotel every time. However, with this market being saturated, tiny house hotels can be developed for the high-end market. Because many places with outstanding natural scenery are not suitable for building traditional hotel buildings, clusters of tiny house hotels might provide a better solution. The Fireside Resort in Wilson, Wyoming, USA, is a quintessential example; it offers rentals for private vacation cabins for between \$200 and \$600 per night (Fig. 10).



Fig. 12. Aerial view of Canoe Bay Escape Village [20]

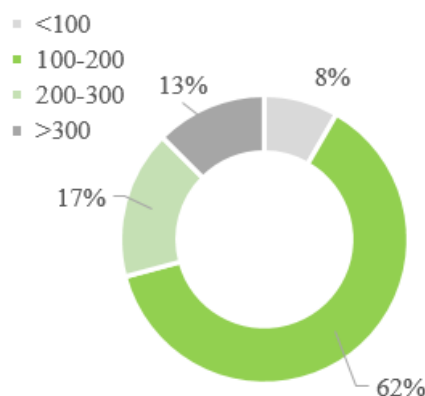


Fig. 13. The Proportion of Tiny House hotels at different ranges of pricing in Canadian dollar

5 Other tiny house markets

Reconstruction is also an important market for tiny houses. In the wake of Hurricane Katrina in 2005 in the United States, 12 architects designed a series of tiny houses for reconstruction, called the Katrina Cottage (Fig. 14). These tiny houses, which cost about \$15,000 each, are regarded as an alternative to the \$70,000 trailer provided by the Federal Emergency Management Agency (FEMA). In March 2016, floods destroyed 5,000 homes in West Virginia. Subsequently, the vocational school in West Virginia launched a new housing relief program that encouraged students to build tiny houses to provide people whose homes had been destroyed with a more private, settled place to live (Fig. 15). This project built 15 tiny houses under 46 m² (500 ft²), and the school later received a \$75,000 contract from Habitat for Humanity and Proctor & Gamble to build at least three tiny houses [22].



Fig. 14. The Katrina Cottage in USA [22]



Fig. 15. A tiny house for disaster relief [22]

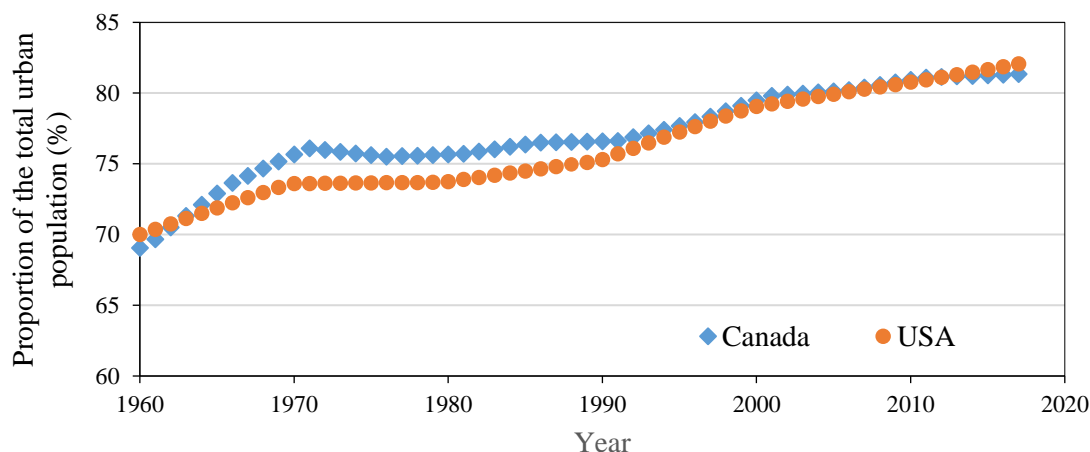


Fig. 16. Proportion of the total urban population in the USA and Canada from 1960 to 2017 [24]

The report “World Urbanization Prospects 2014”, released by the United Nations, showed that 54% of the world’s 7.2 billion people live in cities, and the urban housing supply is already tight. By 2050, the number is expected to rise to 6.33 billion, 66% of the projected population of 9.6 billion in this global [23]. At present, several large cities in the United States are actively exploring tiny houses to solve the housing shortage caused by high urban density. Although North America is sparsely populated, over 80% of the population lives in cities (Fig. 16) [24]. With the number of single households on the rise, many new housing units under construction are becoming smaller, close to or marginally beyond the standards of tiny houses, challenging municipal housing and zoning regulations [25]. Many architects and architecture firms start to learn from the successful story told in Japan, whose capital city, Tokyo, is one of the most densely populated cities in the world, with 6,000 people per square kilometer. Japanese architect Denso Sugiura, who has designed 137 tiny houses over the past 20 years, possesses extensive experience of efficiently using small spaces [26]. The former mayor of New York City (USA), Michael Bloomberg, launched a design competition in 2012 to encourage designers to create tiny homes for small size families of one or two people. As a result, My Micro NY was designed, selected, and completed in 2016 with 55 apartments measuring between 23-34 m² (250-370 ft²). To make such tiny apartments more space-efficient, the builders teamed up with a furniture company to create built-in furniture that combines three functions, sofa, bed, and storage, so as the living room and bedroom can be in one place [27]. Unfortunately, only 14 of these tiny apartments ended up being rented as affordable apartments at below-market prices. Although the building was constructed in partnership with the local government as a solution for affordable housing for the middle-class of new yorkers, such tiny apartments failed to play a major role in solving low-income housing problems because the building owners could not set a cost-effective level for rental.



Fig. 17. Exterior of My Micro NY, USA [28]



Fig. 18. Interior of My Micro NY, USA [28]

The problems of refugee resettlement emerged in North America in recent years, which calls for the tiny houses. According to CBC news, the United Nations announced that Canada was the world's largest recipient of refugees in 2018. Of 92,400 refugees from 25 countries in 2018, Canada came in first with 28,100 and the United States second with 22,900 [29]. With the governments in the United States and Canada being under increasing pressure to accommodate these refugees, tiny houses can be an effective approach to help refugees settle down and integrate into local communities. In 2017, Quartorze, a French non-profit group, launched a campaign IMBY in Paris, France, to help refugees who had been granted residence permits. However, these refugees felt to be excluded from French society. In this case, tiny houses can help them maintain contact with local French people and broaden their social network, thus assisting them to obtain employment and permanent homes [30].

6 Endnotes

In general, the tiny house market in the United States and Canada is in a stage of rapid development. The tiny house market was projected to grow by 3.33 billion dollars globally over the next four years, with more than half of that increase happening in North America [31]. Throughout years of promotion by tiny house enthusiasts, related media, and construction practitioners, more and more people have come to realize the advantages of tiny houses in energy conservation and sustainable development. Moreover, inspired by the good performance of tiny houses communities in solving the homeless problem, reducing the housing expenditure pressure of low-income people and post-disaster reconstruction, the zoning regulations and policies in some areas gradually shift the perception towards tiny houses from exclusion to acceptance or even encouragement.

With the steady expansion of the tiny house market, the method of designing tiny houses by reducing the size of ordinary houses turned out to be incapability of meeting the demands of the gradually diversified market. The vigorous development of each market segment set many requirements for innovative design of tiny houses. The market required the emergence of tiny houses with more targeted design in terms of materials, structure, price, and customer's demand.

It should be indicated that wood frame tiny houses exhibit their super advantages, in terms of sustainability and environmental friendliness, over those made of metals and plastics. As a biomaterial, wood possesses its natural ability to mitigate carbon dioxide (CO₂). During the growth of trees, wood is produced, sequestering carbon. After wood is processed into various products, they can be used in construction of tiny houses and store carbon over their lifespan. Therefore, wood and wood products can certainly play an instrumental role in the circular economy by providing a renewable source of building materials and contributing to a lower carbon footprint for the construction sector. The development, fabrication, and use of wood frame tiny houses can foster a sun-rising industry and gift many benefits to human beings.

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Conflicts of Interest

The authors declare that they have no conflicts of interest for the present study.

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