Model Cities, a nonprofit organization based in St. Paul, submits the following proposal to the Minnesota Challenge competition. The proposal presents the use of modular construction as a strategy to help reduce the cost of developing affordable housing in Minnesota. Modular construction produces buildings in sections, or modules, within a factory setting. The modules are then transported to the building site where they are installed on a permanent foundation.

CONCEPT

1. **What is your cost reduction idea, concept, or strategy?** The use of modular construction will help reduce the cost of building affordable housing units for low and moderate income households.

2. **How will your idea reduce the overall cost of developing affordable multifamily housing in Minnesota?** The use of modular construction will reduce the overall cost of developing affordable housing primarily by reducing the construction timeline, which, in turn, decreases financing and soft costs. At the same time, this technology increases efficiencies in the construction process by assembling major components of a building in a quality controlled factory setting, which will help projects realize economies of scale.

3. **What cost driver(s) is it addressing?** Modular building would affect a significant cost driver related to project financing. Because the affordable housing market often consists of a smaller pool of investors that dictate financing terms, developers must often wait until the end of construction or later to receive all of their permanent financing. This results in developers having to pay interest on interim construction financing over a longer period of time. Modular building would result in a shortened construction timeline that would decrease the amount of interest paid. Given the shorter timeframe, soft costs such as construction oversight and fees for construction draws could also be reduced. In addition, this method of construction would address the cost driver of developers using highly customized designs for projects. Instead, modular construction allows projects to become more efficient through a standardized construction process in a factory setting.

4. **How is the idea related to the concepts and recommendations in the Bending the Cost Curve report?** The Bending the Cost Curve report encourages allowances for more innovative building techniques, of which modular construction would be one. At the same time, it would maintain the same quality as traditional techniques. Modular construction would also produce economies of scale when modules are being assembled in a factory due to factors such as the bulk purchasing of materials or the prevention of delays due to weather. Because of the more standardized process, savings in architectural and engineering fees could be realized as well if modular design is assumed from the start of the project. Cost overruns tend to be minimal on modular projects because modules are highly engineered in the factory and then come to the building site largely complete before final installation on-site.

COST SAVINGS

5. **On a per unit basis, by how much will your idea reduce Total Development Costs (TDC) for a typical project?** It is estimated that for a larger multi-family project modular construction could reduce Total Development Costs (TDC) by approximately $2,500 to $4,000 per unit in many cases. This is contributed largely by a reduction in construction interest paid and depends on factors such as the
size of the project, amount of debt service, interest rates and terms. It also considers a moderate reduction in other soft costs, such as architectural fees (assuming the modular approach is used from the start of the project) and construction oversight. If preferred, the modular components can be completed with interior finishes right down to carpet, wall finish and connection of utilities, and they all comply with regional codes. Because these products are purchased in bulk, the project will recognize a cost savings, thereby reducing the per unit cost.

6. **How widely can your strategy be applied?** This strategy could be applied statewide, in both rural and urban settings. This technology has been utilized in both types of locations across the country. Suppliers are already located in Greater Minnesota, and there is interest in seeing this technology more widely utilized in the Twin Cities region.

7. **To what types of new construction and rehabilitation developments, projects, and locations can it be applied?** The technology could be applied largely to new construction developments in smaller towns, larger cities or in rural settings. Champion Builders, a company located in Worthington, MN, has already used this technology in mixed-use development, low-income housing tax credit projects, and military housing. Additionally, it has successfully constructed smaller multi-family buildings to help meet housing demand in the oil fields of North Dakota. Modular construction can also be used in constructing single-family housing, such as the “weeHouse,” which has been designed by Alchemy Architects, a St. Paul-based company.

8. **Considering the full range of affordable housing developments in Minnesota, what is the range of cost-per-unit savings that would be achieved?** Depending on the type of project, it is estimated that the per-unit savings could be approximately $2,000 per unit on the low end (single-family housing) and up to $4,000 per unit on the high end (multi-family housing) in many cases.

9. **What type of developments, projects, and locations would be on the high end and low end of the range?** On the high end, the technology could be used in larger multi-family developments with an estimated savings of between $2,500 to $4,000 per unit, depending on debt service and how large the project is. It could also be used on smaller single-family housing and allow for a savings of >$2,000 per unit. Because single-family construction requires significantly less construction financing, the savings for this type of project would be minimal. For a larger multi-family project that requires private financing, this could represent a savings of several hundred thousand dollars, again, depending on the project’s size.

TEAM

10. **Who is on your proposal team?** Craig Johnson & Brenda Bailey, Model Cities of St. Paul, Inc.; Mike Trossen, TWP Architects; Shane Weiss, Flannery Construction; Steve Payne, Champion Home Builders; Gita Sweeney, Development Finance Consultant

11. **What perspectives from the development and financing process do they represent?** The team represents multiple perspectives of the development process, including developer/owner, architect and construction. Also on the team are a finance professional, who would bring expertise on analyzing housing finance scenarios, and a manufacturer with experience in modular construction.

12. **What additional team members or skills, if any, would you add to the team in Phase II through implementation?** Additional members to the proposal team would include an academic professional
to assist in studying the potential cost reduction of modular build and the possibilities for replicability, particularly in an infill setting.

IMPACT ON HOUSING

13. What impact will the strategy have on the quality, durability, energy efficiency, and location desirability of the resulting affordable housing? Modular construction would provide the same or better quality and durability as traditional methods and would also bring a high level of energy efficiency to projects. According to the website of the National Association of Home Builders (NAHB), modular construction “in a factory setting allows for more consistent quality due to uniform construction processes, training techniques and inspections….These homes meet and often exceed all requirements of locally adopted building and fire codes.” The NAHB website also states that modular homes “are often more tightly built and thus more energy efficient, which can result in lower heating and cooling costs for the homeowner.” The NAHB adds that they are “green by their very nature…. assembly in an enclosed indoor environment allows them to fulfill some key components of green building certifications, including that waste of material at the factory and the job site is reduced and environmental impact on the land and the community where the house is being delivered is lessened.”

14. What impact will the strategy have on the ability of the resulting rental housing to serve low and moderate income residents and vulnerable populations? The most significant impact that modular construction would have on low and moderate income residents is that it will speed up the construction timeline, thereby allowing such households to be housed in safe, affordable housing more quickly than they otherwise would. In addition, because modular builds are energy efficient and environmentally friendly, monthly expenses will be substantially less.

IMPLEMENTATION

15. What will it take to implement your strategy? The proposal team will finish its work in developing this concept during Phase II of the Minnesota Challenge, bringing the experience in development, finance and modular manufacturing necessary to do so. After the Minnesota Challenge competition is completed, the team expects that opportunities to carry out the strategy through demonstration projects will develop throughout the state due to increasing housing needs that will continue to create a demand for affordable projects.

16. What barriers and challenges will you face, and how will you address them? A potential barrier is that lending institutions and funders may be unfamiliar with modular construction and, therefore, could be hesitant to fund projects using this technology. The proposal team expects that its fully developed idea during Phase II of the Minnesota Challenge will show that a modular construction project can realize cost savings while not compromising on quality. The team would also offer opportunities for stakeholders to view other completed projects and provide Q&A. The goal is that funders would be responsive to this information by funding projects using this technology in a variety of settings, whether urban or rural.

17. With sufficient implementation support, when would your idea be fully operational? It is expected that, upon completion of the final presentation of the concept in May 2014, a demonstration project would be completed in the Twin Cities within 1-2 years.
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Submitted Files

Upload Phase I Submission
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