UMore Park
Creating energy-efficient, affordable housing

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Carlson Ventures Enterprise Project
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Executive Summary

UMore Park is developing a sustainable community where a diverse body of citizens can live, work, and play. A key component of this vision is maintaining housing affordability in order to attract a diverse, culturally-rich group of citizens to the neighborhood. The challenge for the University and its developer partners will be to intersperse affordable housing units, both rented and owned, throughout the neighborhoods in the planned community without sacrificing the goals for sustainability and energy efficiency.

Currently, many developers do not think about or try to build energy-efficient, affordable homes as the primary focus is keeping costs low. Developers and home-owners alike do not recognize the long-term value of green investments.

The University is interested in developing a comprehensive proposal that it can present to potential residential developers. Its goal in creating this proposal is to present developers with facts and data that make a compelling case for the developer to want to partner with the University on this project.

The Carlson Venture Enterprise’s (CVE) role is to investigate the key elements that will help to make a compelling case to future residential developers that energy-efficient affordable housing is feasible and is a main feature for this sustainable, University-founded community.

The following report will outline the research methodology, insights, and recommendations that the team uncovered over the course of the semester.
Methodology

For this project the CVE team took a two-phased approach to conducting research. First, the team completed secondary research by scanning the existing literature around energy-efficient and affordable housing. Over 50 articles, journals, academic papers, and online sources were reviewed in this phase of the project. Through this research the team developed a greater understanding of the overall objective of the project and collected a number of initial thoughts and data from outside sources.

The team then entered into the primary research phase of the project in which 18 interviews were held with industry experts, developers, builders, architects, and urban planners. The breakdown of these interviews is as follows:

<table>
<thead>
<tr>
<th>Primary Sources</th>
<th>Secondary Sources</th>
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<tbody>
<tr>
<td>Architect</td>
<td>2</td>
</tr>
<tr>
<td>Builder/Developer</td>
<td>7</td>
</tr>
<tr>
<td>Industry Expert</td>
<td>7</td>
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<tr>
<td>Urban Planner</td>
<td>2</td>
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<td>50+</td>
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<table>
<thead>
<tr>
<th>Area of Focus</th>
<th>Name</th>
<th>Company</th>
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<tbody>
<tr>
<td>Industry Expert</td>
<td>Marilyn Bruin</td>
<td>U of MN – College of Design</td>
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<tr>
<td></td>
<td>John Carmody</td>
<td>U of MN – Center for Sustainable Design</td>
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<td></td>
<td>William Weber</td>
<td>U of MN – Center for Sustainable Design</td>
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<td></td>
<td>Larry Laukka</td>
<td>UMore Park &amp; Others</td>
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<tr>
<td></td>
<td>Derik Mahew</td>
<td>Independent Consultant</td>
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<tr>
<td></td>
<td>John Murphy</td>
<td>Independent Consultant</td>
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<td></td>
<td>John K. McIlwain</td>
<td>Urban Land Institute</td>
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<td></td>
<td>David Ramstad</td>
<td>US Dept. of Housing and Urban Development</td>
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<tr>
<td>Architect</td>
<td>Lucas Alm</td>
<td>U of MN – School of Architecture</td>
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<tr>
<td></td>
<td>Rick Carter</td>
<td>LHB, Inc.</td>
</tr>
<tr>
<td>Builder/Developer</td>
<td>Gina Ciganik</td>
<td>Aeon</td>
</tr>
<tr>
<td></td>
<td>Kari Gill</td>
<td>Dakota County Community Development Agency</td>
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<tr>
<td></td>
<td>Cory Lepper</td>
<td>Vine Hill Partners</td>
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<tr>
<td></td>
<td>Maureen Michalski</td>
<td>Schafer Richardson, Inc.</td>
</tr>
<tr>
<td></td>
<td>Avery Seavey</td>
<td>Blue Sea Development</td>
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<tr>
<td></td>
<td>Steve Wellington</td>
<td>Wellington Management, Inc</td>
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<td></td>
<td>Tyler Wenkus</td>
<td>Gonyea Companies</td>
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<tr>
<td>Urban Planner</td>
<td>Michael Lander</td>
<td>Lander Group</td>
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<tr>
<td></td>
<td>Geof Syphers</td>
<td>Independent Consultant</td>
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The intent of the interviews was to obtain key insights from a variety of industry professionals from different geographic regions and whose experience focuses on several different product types. The focus of each interview varied depending on the individual’s area of expertise; however, each interview generally covered the following topics:
A complete summary of each of the Informational and Developer Interview Summaries can be found in Appendix A and B of this report.

**Insight Themes and Recommendations**

Based on the secondary and primary research conducted, the CVE team extracted a number of key insights that helped in the formulation of the recommendations. This section will outline the four insight themes that emerged and the resulting conclusions.

**Energy Efficiency**

Throughout the research process a wide variety of views on energy efficiency were revealed. Forming a consensus on which technologies currently provide the biggest “bang for the buck” in energy efficiency is difficult and speculation on which technologies offer the best hope for the future is even more divergent. Despite the lack of consensus, a significant amount of information on the current state of energy efficiency strategies was compiled during this study.

- **Lighting** – Incandescent lighting has generally been replaced by fluorescent bulbs. LED lighting is considered superior to fluorescent lighting and should be strongly considered in any future projects.
- **Windows** – Installation of double or triple pane, high solar gain, low-E windows is ideal in a cold climate to reduce heat loss. Double pane and low-E coatings are becoming common.
- **Super Insulation** – With proper heat recovery ventilation, homes using very high levels of insulation and airtight construction can significantly reduce the heating needs of a structure.
- **Roofing** – While “white roofs” are not as applicable in a cold weather climate, a “green roof” is still a significant advantage for a structure with a flat roof.
- **Solar Panels** – A well known technology, still not seen as cost effective, especially in this region with a long period of short sunlight exposure each year.
- **Solar Shingles** – Seen as aesthetically superior to panels, and newer designs have resulted in easier installation, reducing cost. However, they continue to be cost prohibitive. Multiple interviewees expressed confidence in the ability of solar shingles to become more affordable and efficient in the near future.
- **Ground Source Heat Heating (Geothermal)** – Cost of installation currently makes payback period impractically long, especially for single-family homes not tied into a district model.
• **SIPs (Structurally Insulated Panels)** – While questions regarding modular construction were generally met with skepticism, SIPs were touted as a valuable innovation that will eventually reduce material and labor costs as compared to a typical frame structure. Moreover, SIPs provide superior insulation and increased energy efficiency.

• **Water Efficiency** – Solar and hybrid hot water heaters were mentioned on several occasions as a technology that could gain relevance in the near future. In addition, while not strictly considered energy-efficient upgrades, rainwater collection and reuse, as well as indoor water conservation (low-flow sinks, showers and toilets) are considered essential for any green development.

While understanding the current available technologies is important to properly plan a development, it becomes surprisingly less relevant when considered against other concepts that are vital to planning a more sustainable community. Primary and secondary sources consistently emphasized that energy efficiency is a concept that cannot be limited to on-site energy generation, consumption, and conservation.

Many argue that defining the energy efficiency of a project should encompass the overall carbon footprint of the entire project throughout its life cycle. One should consider material production, sourcing of materials, and the energy costs of transporting those materials. Eventual reuse or disposal of building materials is a key component. Consideration of the transportation needs of residents, and planning the neighborhood accordingly is of utmost concern. Density dramatically affects the footprint of a development. Considering all of these factors requires careful planning and a keen awareness of which issues will have the most dramatic impact on the development. Building a zero-energy home is a desirable outcome, but is less significant if its occupants are driving their vehicles 100 miles per day.

**Energy Efficiency Standards in Affordable Housing**

Examining how to encourage energy-efficient building in affordable housing requires an evaluation of the current landscape. New affordable developments are currently guided by the Enterprise Green Communities Criteria, which is a certification system with mandatory and “points” based elements, similar in some respects to LEED certification. This certification already ensures significant sustainability requirements above current building codes for market rate housing.

The criteria include a checklist separated into several categories: Integrative Design, Location/Neighborhood Fabric, Site Improvements, Water Conservation, Energy Efficiency, Materials, Healthy Living Environment, and Operations/Maintenance.¹ Like other checklist oriented programs, this system ensures compliance and is a helpful resource, but it has limitations.

The mandatory elements are almost entirely common solutions that every developer would incorporate regardless of environmental impacts (proximity to basic services, compact development, and Energy Star and EPA compliance, for example).

The optional elements have potential for significant energy efficiency improvements. However, utilizing a point system discourages outcome based planning in favor of reaching 35 points at the lowest initial

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cost. An outcome based approach would consider all possibilities, and attempt to model the lowest possible energy use given a limited amount of resources. This may even include solutions that are not currently accounted for by the Green Communities Criteria. For example, the optimal solution for a specific development may make use of a ground source heat pump which is not specifically mentioned in the criteria.

In sum, the Green Communities standards are doing a great deal of good, but there is significant room for improvement. By meeting Green Communities standards, a developer can claim they are building a green project; in reality they are achieving the minimum. The ability to incentivize a builder to exceed expectations is limited in the current model. UMore could simply require a developer to meet a higher proportion of Green Communities’ optional points in order to do business (or make some optional criteria mandatory). UMore could also assist developers in keeping up with rebates and government incentives if and when they come available.

Unfortunately, these strategies do not address the fundamental problems with a checklist-based system. Every project is different, requiring unique solutions to energy efficiency problems. Additionally, these solutions are integrated solutions. A checklist system by nature separates energy efficiency improvements into line items. The reality of green design in home building is that energy efficiency is a holistic endeavor that results in tradeoffs and contradictions.

Fortunately, leaders in sustainable development are aware of these limitations. UMore should be able to recognize these leaders by their attention to outcome-based design. Developers and architects who stake their reputation on green building measure their success by performing extensive energy modeling, predicting likely energy use, and then collecting performance data for several years to evaluate their projections. The ability to report on a project’s performance is a key indicator of a developer’s dedication to an outcome based approach to sustainable design.

**Recommendation – Energy Efficiency**

UMore Park should pursue an outcome-based approach with developers and builders in order to ensure that its buildings and houses are sustainable. Identify developers who understand that sustainability requires an integrated approach to energy-efficient design and who have a track record of defining and meeting outcome-based criteria.

**Market Demand**

By examining the housing market, and particularly the standards around affordable housing, the CVE team investigated economic trends and market challenges that UMore Park must overcome in establishing the development. Factors beyond identifying the need for an affordable housing mix go into creating a community and the team has identified some ideas for UMore around understanding market signals and solidifying market demand for UMore Park.

**Economic Trends**

In the housing market, there are some well-established ideas about what drives demand – mainly location and market conditions. These trends were prevalent throughout the secondary and primary
research and it became clear to the team that UMore Park must understand and plan the community with these trends in mind.

Michael Lander, one of the community planners the CVE team spoke to, said “There is just too much inventory of conventional housing in a suburban setting.” He went on to provide an example of South Minneapolis versus the other metro suburbs. Lander contended that 70 percent of the market demand is for more conventional suburban homes and 30 percent is for homes in an area like South Minneapolis. He continued by saying that while the 70 percent is larger, that group has an overabundance of homes to choose from. On the other hand, the smaller 30 percent does not have a supply of homes. His conclusion was that focusing on a larger segment may not be optimal if there is over supply for that segment.

In other words, the Twin Cities has more than enough housing for people who want large yards on quiet streets in the suburbs. Since UMore Park is already located in the suburbs, the question becomes how it can set itself apart from nearby communities.

Another market insight mentioned by several interviewees was that high quality school districts are a key selling point for residential properties in a community. Quality schools have been a driving force in residential sales for many years and this trend is one that will continue. Moreover, with the increased public awareness of public school reform initiatives, this issue may have an even greater impact in the future. While this is not something that UMore can control, a deep understanding of the local public education system in the Rosemount area can be leveraged to attract families to the area.

The students of Independent School District 196 (serving the city of Rosemount) consistently exceed statewide averages on the Minnesota Comprehensive Assessment (MCA) tests. However, the district continues to report an achievement gap between White and Asian students, and Black, Latino, and Native American students. Overall, the school system in the surrounding area is working in UMore’s favor, but UMore must continue to monitor and potentially work with the district to help close the current achievement gap.

And finally, Steve Wellington, a planner, summarized the economic impact on developments best when he said, “A successful development does not depend on the developer, it depends on the market.” Regardless of UMore’s goals and its developer partner, without demand UMore will just be a large plot of land with empty houses. UMore must have demand in order to fill those houses.

**Market Challenges**

While overarching economic trends are ones that UMore must continually acknowledge, UMore must also face the challenges that it has created by wanting to include affordable, market-rate, and energy-efficient homes in its community. Through the research process, the CVE team identified two main challenges that UMore will have to overcome in identifying the appropriate market for the development.

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2 Independent School District 196 Annual Report, 2009-2010
First of all, many developers are skeptical as to whether or not single-family home owners would be willing to pay a premium to live in a sustainable lifestyle community. The CVE team found that developers generally believe energy-efficient homes are more expensive to build and are consequently more expensive to buy. UMore has to show developers that there is a real demand for these homes or demonstrate that sustainable homes are not more expensive.

The other key obstacle to overcome is the disconnect that exists in the current data on market rate, affordable, and energy-efficient homes. Overall, affordable-housing home owners and typical single-family home owners require drastically different housing sizes. Affordable homes range from 1,200-1,500 square feet and single-family homes average around 2,500 square feet.\(^3\) Energy-efficient home sizes are in the same range as affordable homes, making them a poor fit for your typical suburban neighborhood. UMore must reconcile the discrepancy between what it wants to do in sustainable living with what has had historical success in the market.

**Who Will Live in the Community**

One way to overcome these challenges is to better define who will live in the community. When thinking about who will live in UMore Park it is important to consider what factors can help distinguish a community and the tradeoffs involved in selecting a community model. The following table lists several community models and the tradeoffs that exist in choosing between each of those options.

<table>
<thead>
<tr>
<th>Community Model</th>
<th>Trade-offs</th>
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<tbody>
<tr>
<td>Urban vs. Suburban</td>
<td>Proximity to services, yard space</td>
</tr>
<tr>
<td>Market-Rate vs. Affordable</td>
<td>Size of home, type of unit or building</td>
</tr>
<tr>
<td>High- vs. Low-Density</td>
<td>Yard space, energy-use</td>
</tr>
<tr>
<td>Energy-Efficient vs. Conventional</td>
<td>Size of home, materials/techniques used</td>
</tr>
<tr>
<td>Single- vs. Multi-Family</td>
<td>Size of home, privacy</td>
</tr>
<tr>
<td>Income Driven vs. Mixed Income</td>
<td>Size of home, type of unit or building, demographics of community</td>
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As the table illustrates, in selecting a community type one is also making a decision between certain attributes that will distinguish the community from others. These tradeoffs, however, are what will help UMore identify what type of market to appeal to.

This sentiment of wanting to know what the UMore Park community would be like was repeated throughout the interviews, as many people asked the CVE team, “Who is going to live in UMore Park?” The interviewees wanted to know what type of residents UMore is targeting, what they would care about, and what will ultimately draw them to the community.

If UMore Park’s goal is include both market rate and affordable homes, as well as be energy-efficient, then UMore must make certain tradeoffs in order to meet and create market demand for its homes.

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\(^3\) PPL Website/Arroyo Chico Housing Trust/Family Housing Fund and U.S. Census, respectively.
Meeting and Creating Market Demand
While identifying a specific type of homeowner for UMore Park was outside the scope of the project, the CVE team can provide some insights for how UMore can better prepare itself for addressing community model tradeoffs in order to meet and create market demand.

First of all, in order to prove to developers and homeowners that sustainability can be affordable, UMore should consider developing a prototype house or small neighborhood model that meets the sustainability outcomes UMore hopes to achieve. A prototype house can help demonstrate the energy-efficiency standards UMore wants to attain at the home level. On the other hand, a small neighborhood model can exhibit the careful planning and interconnectedness that go into making decisions on each component of the community, something that will be addressed in more detail in the next section. Overall, these representations can aid in proving that UMore’s vision is achievable at an affordable price point. These models can also be used to analyze how scale would affect the economics as the community is developed and help in UMore’s efforts to communicate and market the overall vision.

Furthermore, while there is a market for affordable housing in Rosemount, it could be very difficult to attract people there. The CVE team learned that most affordable housing for residents in Dakota County is for people who work in and near Dakota County and not in the core cities. Therefore, if a significant number of new units are built, it could be difficult to find people to reside in those units unless there are jobs for them nearby. And if residents are expected to commute outside of the county then transportation costs need to be accounted for when thinking about affordability. UMore must demonstrate that it can either satisfy the need for shared transportation between suburbs or create more jobs in the immediate vicinity. Doing this will require a two-pronged approach that includes, 1) tracking jobs being created in Dakota County, and 2) looking into ways in which the University and/or UMore can help attract new businesses to the surrounding area. Through tracking of jobs being created in Dakota County, UMore can determine if the job base will support the community expansion it is planning. This will help UMore decide if it must more actively seek out business investment near the community.

Recommendation – Market Demand
UMore must assess the overall market demand in light of sustainability goals. To do this UMore should work with its developer partners to focus the initial efforts around a project that can demonstrate demand for UMore. In collaboration with its developer partners, UMore needs to identify the niche market segment to start building for. More specifically, UMore can leverage the expertise of its developer partners to think about how that niche can grow into the overall vision over the next 30 years.

Planning
Though market demand is one piece of the puzzle that UMore needs to understand in order to become successful, UMore must also focus on differentiation. Based upon various research sources, the CVE team found that the community planning process is a critical first step for UMore to achieve energy-efficient outcomes and can help UMore to differentiate itself from the rest of the market.
What Should be the Focus of UMore?

Currently, there is an abundance of homes on the market, with the housing supply in the short-term far outpacing demand. In order for UMore to be successful, the community needs to ensure it is differentiated from what is available in the rest of the market. Part of this differentiation comes from proper planning and thus ensuring the community is well integrated.

The interviews with various developers and industry experts echoed this sentiment. Lucas Alm, an industry expert who is an architect and currently a professor at the University of Minnesota’s School of Architecture and College of Design, said in an interview that “…without proper planning, UMore will be just another community development with energy-efficient homes and car dependent residents.”

An interesting point for energy efficiency attributes at UMore is the fact that many people define energy efficiency very narrowly, meaning they think of energy-efficient buildings and how they operate. Michael Lander from the Lander Group, who is a real estate professional group focusing on urban planning, designing, and management brought into focus how energy efficiency should really be defined much more broadly. He stated “…if you only think green for the building then you are too late… most environmental impact comes from planning.”

Focusing on a Particular Technology or Material Should be Tied into a Design Plan.

Therefore, UMore really needs to focus on the design of the home as much as the materials and technologies utilized in the operation of the home. Geof Syphers, an independent consultant who has experience providing management and technical assistance for designing green buildings and planning sustainable neighborhood developments, helped the CVE team understand how the overall planning and design of a community will impact the details of the materials and technologies utilized in the building of a home. An example he shared with the team is illustrated below.

Large systems are dependent on the size of the house and its energy consumption.

Energy consumption is then dependent on the size and type and layout of the windows.

Energy gained and consumed by the windows is dependent on the position of the house on the street.

The house layout is then dependent upon the layout of the streets in the development.

Thus, it all ties back into the community and building design.

Though the UMore team has already spent a great deal of time planning the UMore development, the research and interviews support continuing to plan the neighborhoods and building types over the next three to five years to ensure that UMore becomes a truly sustainable community. Determining where multi-family housing will be incorporated into the design, whether creating dense areas is appropriate
to incorporate more affordable housing and shared community spaces, and working with a developer partner to determine an outcome-based approach will help ensure the community is differentiated and meets UMore’s goal of becoming a sustainable community.

Recommendation – Planning
Spend the next three to five years planning the UMore Park community. Designing the buildings will depend heavily on the community and building types.

Developer Partners
In order to help UMore best evaluate and determine market needs and changes, it is essential that UMore select the right developer partners. While a typical request for qualification (RFQ) might be the more conventional approach to identifying a developer partner, the CVE team believes the uniqueness of UMore’s vision will require UMore to actively seek out partners.

Developer Approach
Before engaging in discussions with potential partners, it is helpful to understand the development process and where the most value is created for developers. This will allow UMore to better understand each party’s incentives with respect to the development.

- **Acquisition Phase**: Identification and acquisition of underutilized or undervalued land parcels.
- **Zoning & Entitlement Phase**: If the zoning and entitlements to the property at the time of acquisition do not meet the needs of the proposed development, developers will be required to apply for new zoning and entitlements prior to commencing construction. The phase allows the property to be developed to its “highest and best use.”
- **Pre-Development Phase(s)**: Pre-development work typically includes construction of common infrastructure such as storm water and sewer systems, utilities, curb and gutter, etc. It may also include design work for the Development Phase. If development will occur in phases, pre-development work may occur in several stages.
- **Development Phase(s)**: Construction of the respective buildings, homes, or units. This can be completed in stages or all at once. Moreover, it can be completed by one master developer or several builders/developers.
- **Sales & Lease Up Phase**: Upon completion, buildings, homes, units, or space is either sold or leased to interested parties. This can be completed by the master developer or builder/developer, but likely is undertaken by a sales or leasing agent.

Parties are compensated for their work at each phase of the development process; however, the most value is created during the zoning & entitlement phase. Therefore, parties involved with the development at this phase will generate the most return on their investment.

For a master planned community such as UMore Park, the UMore team should consider partnering with a master developer who can help lead the project through the zoning & entitlement phase and onto (and even through) the development phase. A master developer controls a project by running the site, assisting in the plans and design of the master plan, helping obtain financing, overseeing timing of phased construction by builder/developers, and assisting in construction of a portion of the master
development. As such, a master developer could potentially lead the development phase, or UMore could consider passing the development to several national or local builders/developers. Before assessing the development phase, UMore should carefully select a master developer that will add value to the project via its experience and desire to create a sustainable community.

**Selecting a Master Developer**
UMore is not a conventional development and thus requires a non-conventional master developer. Its focus on energy efficiency and sustainability, as well as its proposed composition of commercial and residential development, requires a master developer with a wide range of experience. Although it would be nice to find a master developer who has experience with commercial and residential development, including single-family/multi-family and affordable/market rate homes, it is more important to find a master developer who has the same common vision of sustainability as UMore.

UMore will require a master developer that is committed to being involved in the overall design and planning of the community. Clear boundaries and roles will need to be established for the two parties, but UMore and the master developer should be expected to challenge each other in order to drive the notion of sustainability into the development.

Moreover, UMore needs a master developer who is innovative and not afraid to push the threshold of sustainable development. They need to be willing to answer the unknowns. They also need to manage the development with parallel plans, so that if UMore faces an unseen obstacle the development will not be delayed.

**Selecting Parties for the Development Phase**
In speaking with various builders/developers, it was mixed as to whether a large national builder or a variety of smaller local/regional builders would be best suited to tackle the development phase. In terms of an ability to drive down overall costs of construction, a large national developer has the most leverage to reduce cost through the value chain. However, a national developer may lead to a generic design and product that is similar to other developments. Multiple local/regional developers should offer more variety in terms of design and differentiate UMore from other developments. Local/regional developers may also be more in tune with the local supplies and materials that could aid UMore in its vision of sustainability and increased energy efficiency. Even though most developments are driven by cost, UMore is atypical and thus use of local/regional sustainable developers could be the best fit for the project.

However, given that most of the value in terms of potential profits will be generated by UMore and the master developer during the zoning and entitlement phase, it may be difficult to incentivize a building/developer to build within UMore. Therefore, UMore should consider a master developer that is open to constructing an initial phase in order to jumpstart demand within the community. Moreover, it may need to consider incorporating the cost of developing common community needs such as coffee shops, markets, and basic services into UMore’s construction budget in order to illustrate that UMore offers what the market demands from day one. UMore could also entertain a profit sharing model or
land options at below market rates to attract developers, however this could be difficult to implement given the number of developers that will likely be needed to develop all 5,000+ acres.

**Recommendation – Developer Partners**

UMore Park is a non-traditional project that requires non-traditional development partners. Therefore UMore must find a master developer and development partners who share a similar vision of sustainability and can bring innovative ideas to the project. Without a strong master partner it will be difficult for UMore to identify the proper market and design and develop a successful sustainable community.

**Conclusion**

Energy-efficient affordable housing is a main feature for the University-founded community of UMore Park. While skepticism may exist over the potential success of this model, the CVE team is confident that UMore Park can overcome this uncertainty and attract developers to this project. As UMore continues towards its ultimate goal of creating this one-of-a-kind community, it is critical to keep in mind the key elements that will help to make a compelling case to partners that an energy-efficient community with affordable housing is feasible. The research that the CVE team conducted can be synthesized into four main takeaways to keep in mind as UMore continues the planning process:

- Identifying energy-efficient technologies and materials is not enough. UMore must use an outcome based approach in order to discover the most innovative, sustainable solutions for the development as a whole.

- Demonstrating demand for mixed income housing and sustainable homes requires that certain contradictions in these community models be resolved. UMore must address these inconsistencies to persuade skeptical developers that mixed income housing and sustainable homes are feasible and profitable.

- Planning for the development will need to be more holistic. UMore should work with a master developer to plan each detail – down to the position of streets and windows – in order to deliver the best environmental footprint.

- Using the vision of sustainability is critical to attracting the right developer partners. UMore must ensure that its partners have a shared vision and are willing, with UMore, to push the envelope to make this unique community model work. A traditional master developer or developer/builder is not the right partner for UMore.
Appendix A: Industry Expert Interview Summaries

Interviewee: Marilyn Bruin, Associate Professor, Housing Studies Program
Company: University of Minnesota: College of Design - http://design.umn.edu/
Date: Monday, March 7, 2011

Overview: Marilyn is an Associate Professor for the Housing Studies Program in the University of Minnesota’s Department of Design, Housing, and Apparel. Marilyn’s studies focus on affordable housing, housing policy, low income neighborhoods, residential satisfaction and family housing decisions.

Key Insights:
- How do you overcome the thought that UMore Park is “too far” and “won’t work”?
- State subsidies are most likely in Construction phase of project and possibly in acquisition & pre-development phase, not likely in maintenance & operations phase.

Interview Notes:
1. Vision for this type of ideal community (UMore Park)
   An inclusive community in which there is affordable housing, senior housing, disabled persons housing, upscale communities, etc. all mixed together. But how do you do this all at once? And how do you promote home owners to purchase here if there is not a commercial sector to support the community or provide jobs close to home? Potentially attracting a medium/large sized company to build/base in the community first would work – business incentives, state credits, work force with a variety of skill levels must be supported.

   What’s the ideal demographic of this area? Is it similar to Rosemount, Apple Valley, Rochester, or none of the above? Need to know who you want to live there in order to know how to build the community to attract people.

2. Financial incentives/ideas
   Land trust options would be interesting to look into for this site with a non-profit owning the land and leasing it back to the residents. Social issue to mitigate/consider: if neighbors pay drastically different rates due to income disparities will that create tension within the community?

   How will the U of MN sell the land – what price points will be used? Note that Dakota County qualifications for low-income housing are inflated based on higher income ranges and housing prices in the area. How does this impact who would qualify for this type of housing?

3. Role of the University
   How best to leverage the connection to the U of MN?
   - Keep businesses based in MN through additional financial incentives and subsidies for locating in UMore Park.
● Create connection between low income families and the U of MN so that when children grow up they go to the U of MN and receive an education they may not have otherwise received.

4. **Developer considerations**
   One of the most critical things to figure out is how to make a developer believe the units will sell – risk vs. potential success based on this new model. Need to make someone buy into this new model for community development. This is linked back to the question behind driving business to UMore Park in order to promote viability of housing.

Developer will want to know who will pay for transportation/roads, who will establish the grocery stores, etc.
Interviewee: John Carmody,  
Company: University of MN: Center for Sustainable Research - www.csbr.umn.edu/  
MN Green Communities - www.mngreencommunities.org/  
Date: Thursday, March 24, 2011

Overview: The Center for Sustainable Building Research’s mission is to “lead and support—through research, outreach, and education—the transformation of the regional built environment to provide for the ecological, economic, and social needs of the present without compromising those of the future.” John is Director of the Center and has 30 years of building and design related experience. John is also a Board Member of MN Green Communities, an organization that oversees and establishes building standards for affordable housing projects in Minnesota.

Key Insights:
● We should shift our focus of affordable housing from just the cost to a focus on multiple objectives – including cost, sustainability, healthy buildings, and durable buildings.

Interview Notes:
1. When does MN Green Communities become involved with a project?  
   Any public funding for affordable homes flows through MN Green Communities which provides the gap financing required to complete these projects. There are certain objectives that must be met in order to receive financing for the project (which can be found online).

2. Payback period can be 2-3 years for green projects, which helps make them interesting and appealing to current homeowners.  
   Many things such as better windows are improvements home owners can reap the rewards from in a shorter period of time and make them appealing to even affordable home buyers. Also, many utility improvements can be made with a payback period of 2-3 years so that current homeowners can reap the rewards.

3. What is the main difference between MN Green Communities’ standards and those of other agencies such as LEED?  
   Construction standards are similar; however, LEED requires continuous testing and oversight throughout the entire construction process. MN Green Communities is less stringent and relies on representations by the developer.

4. If a developer utilizes any state money or financing programs will the project need to meet MN Green Communities’ standards?  
   Yes, in all cases.
Overview: Larry has experience in residential building and development since 1962. Larry is currently president of L.A. Laukka Development Company, Laukka Jarvis, Inc., and Laukka Realty, Inc., and chairman of Laukka Property Management, Inc. His real estate activities include the design, development, financing, construction and marketing of more than 6,000 units and home sites throughout the Minneapolis/St. Paul metropolitan area. Laukka Management, Inc manages association-style communities built and designed by L.A. Laukka Development Co. Its portfolio currently consists of 49 communities and 6,000 units.

Key Insights:
● “You don’t really find energy efficient buyers at the affordable housing level.”
● “Don’t have affordable housing buyers buying a Prius.”
● “People seeking affordable housing don’t even think that way (energy efficient) – they just think shelter.”
● Easier to camouflage affordable housing if it is attached to an attached building (vs. if it’s a single-family, detached home).

Interview Notes:

1. **What makes sense in terms of timing for the development process for UMore?**
   You can’t really plan more than 3-5 years out because the market and the economy will continue to change. Financing is also tough to come by more than 5 years out.

2. **What about UMore will make it successful versus other big community development projects (such as Jonathan in Chaska)?**
   Several factors will make UMore succeed that other large scale community development projects have lacked in the past: 1) The brand of the U of MN offers a unique aspect to the community that you can’t find anywhere else, 2) The U of MN has the time to make this happen without rushing the development which means UMore can find the right partners and U of MN can keep the land tax exempt, 3) UMore has the money now through the gravel extraction to make this community happen, 4) The need for affordable housing will be what drives people to UMore.

3. **Have you worked on any energy efficient affordable housing projects in the past?**
   Energy efficient and affordable housing are like an oxymoron – there is definitely a conflict between them. Historically, homeowners move every 6-7 years so they don’t typically want to spend more for energy efficient housing when they won’t be around for the full payback period. You really can’t
make people pay more than what they can get back within 3-5 years. Also, we still have not been able to find a way to build affordable housing privately. So to build 10 affordable houses, we have to charge the other 90 homes a higher rate.

4. **What do you think about building affordable housing interspersed in the community?**

   The relationships are not well defined between having affordable housing next to other housing and there are a lot of emotional factors that go into housing when people are taking on debt for 30 years. Those buying affordable housing may not want to be in the same neighborhood as other housing because the standards of living are simply different and the social classes can clash.
Interviewee:  Derik Mahew and John Murphy
Company:  Independent Contractors/Developers
Date:  Tuesday, February 15, 2011

Overview: Johnny and Derek have years of experience building homes that are energy-efficient. They have worked with a variety of unique materials and building techniques in order to create more energy-efficient and innovative homes.

Key Insights:

- You cannot do a 4,000 sq ft home that is super efficient because the more surfaces there are, the more energy loss you will have.
- Smart Design saves a tremendous amount of money so as a homeowner you don’t have to spend a tremendous amount of money!
- “It’s almost irresponsible to not have a passive solar house.”

Interview Notes:

1. Focus on materials:
Think about using straw bale construction which has been showcased in the *NY Times* as the model of architecture. You can also use various small/amateur timbers to help with infrastructure of the house. Low e-glass reflects infrared energy and will keep energy out when you might want it in, so think about using high e-glass even though it isn’t talked about as often. Integrated solar singles is the holy grail that many people have been looking for yet it is more expensive because each shingle has to be wired individually. Even siding has green considerations, consider the durability advantage stucco has over vinyl.

2. Focus on building design:
Think about how to place the roof in such a way where you can get the most of the sun during the winter months and provide shade in the summer, to help reduce energy costs associated with air conditioning. Green roofing materials that provide a living roof can dissipate extra rain water and provide greener features to the home. In-ground source heat pumps can be attractive if you are doing a community model yet ensure no one house is going to receive the “leftovers” from everyone else. Consider looking at more radical ventures for inspiration, such as Casa Kit Homes or whole tree architecture.
Interviewee: John K. McIlwain, Senior Resident Fellow
Company: Urban Land Institute (ULI) - www.uli.org/
Date: Tuesday, March 1, 2011

Overview: John K. McIlwain is the Senior Resident Fellow and J. Ronald Terwilliger Chair for Housing at the Urban Land Institute (ULI) in Washington, D.C. Established in 1936, ULI is a non-profit research and education organization that promotes the development of affordable housing through the world. John leads ULI’s research efforts to seek and promote affordable housing solutions in the U.S. and other nations.

Key Insights:

- Do not think of energy efficient as more expensive. Much of the cost of a home comes in the maintenance and everything else (transportation, etc).
- Costs to build green are typically 1%-3% more if proper planning is done. The Department of Energy in Colorado is constructing a net zero commercial building and claiming they are doing so for a lot less than average spend.

Interview Notes:

1. How to introduce this community to developers:
   Need to start answering a lot more questions before going head-first into this by thinking about who will live there, how will they commute to work, where will they work, who will this community attract and what are their incomes and life-styles, and what are the current growing demands (such as more urban - more walkable style of living), etc.

2. Own versus rental:
   Need to think about the current economic conditions and how certain standards of home ownership have changed. Many people today cannot afford homes because they have jobs that pay less, are carrying a lot more credit card debt, move more frequently than in the past, and therefore might not be looking to buy a home anytime soon.

3. Where are you seeing the most “green” developments?
   Most energy efficient or “green” developments are commercial. It’s difficult to entice residential developers to adopt new technologies due to return hurdles.

4. Can different ownership models be used to control home prices?
   Yes, structuring a development into a “land trust” or a “long-term lease” can help manage home values to ensure they remain affordable for future owners.
Interviewee: David Ramstad
Date: Tuesday March 8, 2011

Overview: David Ramstad is a Construction Analyst for the U.S. Department of Housing and Urban Development (“HUD”). He reviews construction plans and provides cost analysis for a large variety of HUD projects in the Twin Cities area.

Key Insights:

- There is strong potential for green improvements to be utilized in the affordable housing space, particularly geothermal and solar shingles.
- Mixed income housing is a worthy goal, even in single-family housing neighborhoods, but requires careful planning, it has many detractors.
- “Rich people simply do not want to live next to poor people.”

Interview Notes:

1. Where do you think builders will get the most “bang for their buck” in green building in the near future?
   Geothermal is an excellent way to heat the home, and should be more prevalent in the future. Solar shingles also have great potential. They should be more efficient than solar panels. Simple considerations like triple pane windows should not be overlooked. Super insulation is another growing trend that should be particularly useful in cold-weather climates.

2. What are the issues with mixed affordable housing in a neighborhood?
   In general, high income families simply do not want to be near low income housing. Conversely, low income families don’t necessarily feel comfortable in higher income neighborhoods either. They prefer to have more in common with their neighbors. Academic studies have shown that mixed income housing is beneficial for the children but can have adverse effects on adults living in these communities.

3. What other issues need to be considered when endeavoring to build a green community?
   Utilizing an independent energy source (wind turbine, for example) is a good idea, but you will want to consider the effects it has on the existing grid. You will be encroaching on revenues of the existing power companies. Water and trash service often come bundled with these as well and will need to be accounted for.
Interviewee: William Weber
Company: University of MN: Center for Sustainable Research - www.csbr.umn.edu/
Date: Tuesday, March 1, 2011

Overview: The Center for Sustainable Building Research’s mission is to “lead and support—through research, outreach, and education—the transformation of the regional built environment to provide for the ecological, economic, and social needs of the present without compromising those of the future.” William is a Sr. Research Fellow at the Center and is a Lecturer at the U of MN’s School of Architecture.

Key Insights:
- Local municipalities can only encourage, and not demand, that builders build above code unless municipalities have money in the project.
- Prioritize the top improvements to make - usually starting by energy consumption in the house, water, materials used, and the transportation available to residents.

Interview Notes:
1. Focus of design:
   Priority in design is shifting away from “checklist oriented” (LEED Certified, etc.) and more toward “performance outcome” (what are the true rewards from efficiency improvements, more dependent on circumstances of specific project). Continual testing/auditing after completion is necessary to analyze long-term results of construction – for example, monitoring several years of energy consumption of homes that utilized high efficiency windows.

2. Life cycle of costs:
   The industry should also analyze the costs (in terms of impact on the environment) of producing building materials as well as the impact the products have on a home’s energy efficiency.

3. Current green standards for affordable housing:
   Minnesota Housing Finance Agency requires certain green standards to be met. Guidelines used are based on Enterprise Green Communities Criteria (Mandatory Portion).

4. Good references for leaders in green building:
   Good examples of projects that are forward looking in energy efficiency include:
   - Living Building Challenge
   - 2030 Challenge

5. Other thoughts:
   Noted that storm water treatment for new developments should be cost neutral if designed properly.
Appendix B: Developer Interview Summaries

Interviewee: Lucas Alm
Company: University of Minnesota - www.design.umn.edu/index.html
          Habitat for Humanity, Minnesota - www.hfhmn.org/
Date: Tuesday, April 19, 2011

Overview: Professor Alm is trained as a sculptor and an architect, and his work concerns itself with the varied territory that exists between the constructed and natural world. Professor Alm currently teaches graduate and undergraduate level courses at the University of Minnesota’s School of Architecture and College of Design. His current course content includes working with Habitat for Humanity to develop a net zero house.

Key Insights:
- Find the right initial residential group to kick-start the re-development of UMore.
- Focus on a 5-10 year payback for materials to make homes energy efficient and affordable, such as insulation and a strong air barrier.
- For Minnesota, a square footprint offers the best energy efficiency for new homes because of limited seals at corners.
- Risks include the environmental history and issues with UMore.
- Believes jobs need to be there first - then decent transit - then homes - otherwise it's just another community development with energy efficient homes and car dependent people.

Interview Notes:

1. What “green” materials or techniques has Habitat used in its developments?
   Habitat found that to build the net zero home it cost about 10-15% more than a traditional build and the payback for the owners should be 5-10 years out.

   What you can do to make your home energy efficient and get the most bang for your buck includes insulation, insulation, insulation! And ensuring you have a great air barrier.

   With insulation, there are three main types – rigid foam, fiberglass, and cellulose. For our Habitat for Humanity home, we are proposing cellulose be used in every wall which will give it a super insulation shield. Then, don’t forget to address the windows. Though code requires double glazed windows, we are working with triple glazed. For the air barrier, even though this is already required by MN code, we are making it more robust and more thoroughly done. Finally if you are insulating the home so well you have to make sure you have good air quality and thus we are using an active air exchanger.
In general, a single-family home is extremely inefficient in terms of energy usage so sharing a wall or other amenities can give you vast energy and affordability savings.

Payback of 5-10 years

- Lots of insulation – standard fiber glass, cellulose in walls (depth pack -typically in attics only), and foam.
- More robust air barrier system
- Better windows - triple glazed windows
- Air exchanger system for air flow

2. **Opinion on affordable housing:**
   Building really simple building forms also helps for energy and affordability. For Minnesota, a square footprint is the best. Eliminate extra corners in a house – makes the house more air tight and energy efficient vs. having more building to cover.

3. **Transportation is important:**
   You really need to think about having public transportation available for affordable home owners and not just in terms of getting to St. Paul or Minneapolis, but also about how they will get around their own community.

   In my class the students who are working on projects related to UMore have critiqued the distance a lot. Through their research, many of them have concluded that if UMore was open today it simply wouldn’t work because of the lack of public transportation.

4. **What is your outlook for residential development over the next three to five years?**
   I think for the future, developers and contractors really need to think about the lifecycle of materials and what will happen with them when their lifecycle comes to an end. Wood is great because at the end, you can use it for compost or use it for fuel.

   But, with energy prices going up over time, trying to minimize long-term costs for homeowner is a good economic model to follow - more energy efficient is better for homeowner, less burden on owner.

5. **How to jump start UMore:**
   Student ideas: find people that have similar goals in how they want to live, such as senior citizens, and have them share resources (known as Co-Housing). This allows people with limited means to buy more and share more.

   Also, think about using certain types of residents to drive the community demand such as providing housing (studios) for artists who tend to be pioneers in terms of redevelopment for various communities. Risk: These ideas are not the most developer friendly.
Instead of starting the development in the north, maybe start in the south to be closer to agriculture.

Jobs need to be there first and once there is decent transit, then develop the community otherwise it will just be another suburban community focused on getting around with cars. Maybe it is ok to have the first communities be more suburban but then make sure they are designed in a way that can be expanded as things progress in the community and more demand arises.

6. **Possible risks for UMore to consider:**
   Consider the environmental issues with UMore (the U of MN incinerated waste at UMore, it is an old ammunition factory, it is also downwind from a refinery). Perhaps the U of MN can take advantage of the refinery and work with them to use the steam they produce for heat.
Interviewee: Rick Carter  
Date: Friday April 29, 2011

**Overview:** Rick Carter is an architect at LHB, Inc, a Minneapolis based engineering, architecture and planning firm. LHB prides itself on being environmentally friendly, reducing long term operating costs of its clients, and improving the quality of work for its clients. Rick is an expert in sustainable design, and is the project manager for the B3, Minnesota Sustainable Building Guidelines.

**Key Insights:**

- If planned correctly, sustainable design can meet the same budget as “building to code.”
- Outcome based design and measurement needs to replace checklist oriented certifications.
- Instead of looking at MN Green Communities standards as “green”, this needs to be considered as the bare minimum; developments should not be lauded for simply meeting MN Green Communities criteria.

**Interview Notes:**

1. **Is it more expensive to build a development such as Silver Creek (60% more energy efficient than code)?**
   No, we studied dozens of case studies looking at average building cost and energy efficiency performance. The resulting cost per square foot was the same regardless of energy efficiency.

2. **Why do you think you got this result?**
   We believe that you spend what you have, so you do additional research and look at different systems to use. If you design for sustainability from the beginning, you should be able to do so economically. Where you run into problems is when you design to code, and then decide to add improvements afterwards.

3. **What are the technologies that have the most potential for mainstream building in a large development like UMore Park?**
   1. Insulation and there are several examples of advanced technology such as ‘insulated concrete forms’
   2. Ventilation systems such as heat recovery ventilation
   3. Windows
   4. Solar hot water heat which currently offers an 8-10 year payback
   5. Fluorescent or LED lighting
   6. Occupancy sensors and similar technology

4. **When considering energy efficient or green materials or systems, how can architects persuade developers to use such products/systems in a development?**
   We don’t really persuade them but they do come to us because of our reputation for using green and energy-efficient materials. We have an excel model which lists 70+ things that could be used in
development and building and then it allows you to see the various costs and paybacks for those materials and how the savings add up if you bundle different things together.

5. What else will be important in UMore’s efforts to build green communities?
Measurement is essential to ensuring successful green development. When developing these projects, energy modeling, commissioning, and check-listing are all important, but developers should be tracking and reporting actual performance, and comparing these results to their projections. This is a good way to encourage outcome based design.
Interviewee: Gina Ciganik, VP, Housing Development
Company: Aeon - [www.aeonmn.org](http://www.aeonmn.org)
Date: Friday, April 15, 2011

Overview: Aeon is a nonprofit developer, owner and manager of high-quality affordable apartment homes in the Minneapolis/St. Paul metropolitan area. In 25 years of development, Aeon has built or renovated over 1,780 townhomes and apartments.

Currently, Aeon’s portfolio includes:

- 225 homes for low- to moderate-income households
- 385 homes for very low-income families
- 515 homes serving formerly homeless individuals
- 625 homes for minimum wage individuals

Aeon’s current focus is to provide high quality, affordable housing that incorporates innovative and sustainable construction techniques and materials that exceed current building standards (MN Green Communities).

Key Insights:

- There are very few developers in the construction industry that are truly sustainable.
- Most developers will only incorporate “green” into their building if it can is visible to buyers/investors.
- Developers need to look beyond a 3-5 year time horizon, in terms of return on investment (“ROI”), and should consider long-term benefits. A development should be analyzed holistically rather than individual components with individual ROI time horizons.
- New communities need people and transportation first to be successful rather than industry and jobs.

Interview Notes:

1. **Thoughts on “green”/sustainable development:**
   Most developers promote themselves as a “green” or sustainable developer but rarely incorporate truly “green” or sustainable features into their developments. Adding Energy-Star appliances is not being green. It’s common practice. Also, most developers (affordable housing) will not build beyond MN Green Communities’ code. Green/sustainable developers need to look beyond code to be innovative.

2. **What does Aeon use as an ROI timeline for projects?**
   When considering various materials, systems, etc for a new project, Aeon determines if it will provide a positive return (or close to a positive return) over the life of the building or material. Aeon does not use the standard 5-7 year timeline like most developers. Aeon believes that if you use 5-7 years, developers likely won’t include any innovative materials/systems into a development because they don’t provide a return.
Developers also need to look at a development holistically, rather than system by system or material vs. material. Developers need to look for tradeoffs to obtain efficiencies without increasing cost. For instance, using SIPS (Structured Insulated Panels) or concrete in building a structure (rather than stick built) will allow for better insulation. Thus, the project will require a smaller HVAC to be installed.

3. **Where can developers gain the most efficiency in a building?**
   The most efficiency can be gained in the building envelope. Developers should consider SIP’s, which provide superior insulation and can reduce construction time and labor costs.

4. **Does being a non-profit act as an advantage or a hindrance in terms of being a developer?**
   Likely more of a hindrance, but it also has its benefits. By being a non-profit, Aeon can be more innovative and worry less about its impact on profits. At times, Aeon sees itself as an R&D developer. However, as a non-profit it takes much longer to complete a development. Funding typically takes two full funding cycles to receive sufficient funding for a project. Also, do to all of the public and private funding it’s more difficult to meet everyone’s needs. There’s also a lot of paperwork and inspections involved with public/private funding.

   It’s usually 3 – 5 years from the time Aeon commits to a project until it commences construction.

5. **How many funding sources do you typically have for a project?**
   Typically 10-15 sources per project, however it can be as few as 5 or as many as 35.

6. **How is Aeon trying to incorporate sustainability into its developments?**
   Aeon begins by focusing on design. A project’s orientation can have a significant impact on the building’s efficiency. Aeon tries to use passive solar in its design. Aeon is also experimenting with SIPS in their new projects. It’s also trying to design a project so that it won’t need a mechanical system for HVAC. It also would like to focus on water systems and storm water treatment. Aeon believes developers need to strive to reach these unorthodox goals.

7. **What is Aeon’s impression of certifications such as LEED?**
   Certifications are costly. However, they like to know that materials/systems are generating the results they expect. The testing and inspection that comes with a certification allows Aeon to evaluate the results.

   Aeon has two LEED buildings, but does not require certification for all new developments. No matter if a building is certified or not, Aeon does like to work with LEED certified architects and designers.

8. **What incentives are available for “green” or affordable housing projects?**
   There are not many incentive programs for affordable green projects. Some lenders are creating green mortgages that allow owners/investors to capture energy savings in the mortgage. Otherwise incentives are difficult to come by. Aeon uses its contacts to also secure private grants and funding for projects. This, however, has been hit hard by the economic downturn.
9. **What results have you found from mixed income housing?**
   Aeon has not seen any issues with its mixed income projects. So long as construction is of a high quality and residents enjoy their dwelling they don’t worry about the income level of their neighbor. However, if Aeon could, it would construct only affordable housing.

10. **When considering a new community, which needs to come first housing or business/industry?**
    You need to have the people first. However, when thinking of affordable housing, you need to ensure transportation is available. Otherwise there needs to be jobs within walking distance (or a very short car ride) from where someone lives.

    Generally, 50% of the income of an individual living in affordable housing is spent on transportation related costs. Approximately 30 – 50% of income is spent on housing. Any way an individual can reduce their transportation cost can have a significant impact on discretionary income.
Interviewee: Kari Gill, Deputy Executive Director, Housing Finance & Development  
Greg Peterson & Steve Schuller, Development Advisors  
Company: Dakota County Community Development Agency [www.dakotacda.org/](http://www.dakotacda.org/)  
Date: Friday, March 25, 2011

**Overview:** The Housing Finance & Development Department oversees the planning, construction and rehabilitation of CDA owned family, scattered site and senior housing in Dakota County. The department also assists private and non-profit developers of affordable housing with a variety of financing tools that are available through the CDA.

Programs administered by the Housing Finance & Development Department:
- Housing Opportunities Enhancement Program (HOPE)
- Multi-family Revenue Bonds
- Low Income Housing Tax Credits
- Tax Increment Financing

**Key Insights:**
- CDA’s mission is to build the highest quality projects it can afford while meeting city and/or MN Green Communities’ codes. It does not build beyond code because it believes existing code can create energy efficient projects.
- CDA does not believe LEED and other “green” certifications are worthwhile due to the cost of oversight and administration.
- Possible conflicts arise when designing affordable housing for needs of families with children, where less density is preferred (which contrasts with greater density required for more efficient building).

**Interview Notes:**

1. **Roles of CDA:**
   CDA oversees funding for affordable housing in Dakota County. In many instances it also acts as developer, owner, and manager. Focus is multi-family housing; also provides financial assistance to first time home buyers for single-family homes. CDA also oversees financing incentives for privately developed multi-family projects.

   CDA tries to promote development of one senior-housing (60-70 units) and one (multi-family) affordable housing (30-40 units) project each year in Dakota County. The CDA has a list of preferred developers; however, it has a policy to put every project out to public bids.

2. **What is the County’s need for affordable housing in the short and long term?**
   The County currently has two projects under development and three or four projects out to bid. Going forward, the County will surely need additional affordable housing units; however, there is no need in the foreseeable future.
3. Does a lack of public transportation options negatively affect affordable housing options in Dakota County?
The lack of public transportation for affordable housing developments in Dakota continues to be a key issue for the CDA. Currently only one of the CDA’s affordable housing projects is located within close proximity of a metro transit center. The metro transit center provides express bus service to downtown Minneapolis and St. Paul, however offers limited access to the rest of the county. As such, only two of the residents use the transit center on a regular basis.

Studies have shown that most residents in CDA housing work in the county and surrounding suburbs. Approximately 98% of these residents own a car before and while they live in CDA housing. Residents are dependent upon their cars and have stated that lower rental rates of CDA housing (and thus higher discretionary income) has allowed them to invest in more reliable cars.

Most residents/families in CDA housing only have one (maybe two) car, so the CDA typically builds homes with one car garages (even though city codes generally require two car garages).

4. What incentives do developers desire the most?
Developers will take any incentive they can get that does not place too many added requirements/restrictions on their development plans:

- CDA states that tax credits have worked well for townhome projects but not other types of projects.
- Tax exempt bonds seem to be the most accommodating and are the easiest to couple with other incentive programs.
- Tax increment financing has been used by the CDA, but requires the support of the city in which the development is being built.
- Currently there are no incentive programs for energy efficient developments

5. Do your programs work for owner occupied housing as well as rental housing?
No. CDA incentive programs only work for rental housing. The only financing source the CDA has for owner occupied housing is the first time home buyer credits, which can be applied towards owner occupied energy efficient housing.

6. Are your incentive programs available for both public and private developers?
Yes

7. CDA opinion of ability to implement energy efficient building in affordable housing:
MN Green Communities’ requirements go a long way; any additional energy efficiency improvements are very difficult to document. Energy efficiency is often dependent on the density of the building project. CDA focus is on proven methods and technologies, e.g. high efficiency furnaces, changes in air sealing.

8. Other considerations for CDA in building projects:
CDA does not consider specific payback time-frames. They anticipate infinite ownership of these properties, so their focus is on durable materials that last longer, regardless of their “green” reputation.
9. **Can you foresee any issues for the U of MN to work with the CDA?**
   No, however, it should be noted that the CDA acquired a parcel of land just north of the UMore Park project several years ago for future development of affordable housing. The CDA will make a decision, independent of the state of the UMore Park Project, as to when and how it should be developed. The CDA noted that potential conflicts could arise because the density needed to achieve “energy efficiency” may not be consistent with CDA guidelines.

10. **Opinion of modular building:**
    Mixed feelings on modular building (significantly alters ability to do multi-story units efficiently); however, they do see an increase in the utility of “panelized” building. Transportation cost of components can also be a challenge.

11. **What is the CDA’s perspective on LEED Certification or other energy efficient certifications?**
    The CDA applauds innovative construction that exceeds code, however, doesn’t believe in LEED Certification. It feels that the cost of obtaining certification is excessive and would be better spent further upgrading building materials or construction methods.
Overview: Lander Group is a real estate professional focusing on planning, designing, and management of urban development projects. They prefer to focus on “building great neighborhoods” or “Place-building”.

Key Insights:

- Most important thing to consider when considering “green” at onset of a development is community planning (i.e. transportation and density).
- A strong advocate for mixed income housing; “Every building should have some, every block should have some.”
- Low income housing works best when it is designed so it can’t be identified by its outside appearance.
- Need to focus on green community planning because that’s really all you can plan right now since building plans will be obsolete in 3-4 years. If you only think green for the homes/buildings then you’re too late.
- “If UMore was done like South Minneapolis, with better schools, there would be a market for it.”

Interview Notes:

1. What are the most important things to consider when constructing green affordable housing?
   Approximately 80% of green inputs are in the planning stage. When talking about affordability, real estate is generally more affordable the further you get from an urban area, but when you add household transportation to the cost of living, the relationship gets flipped completely (Cited CNT, Center for Neighborhood Technology).

2. How do you utilize planning to make a greener development?
   Engage in community planning that reduces transportation costs. Create “10-minute” neighborhoods. Rethink the model of single-family homes with big yards. Consider dense building in close proximity to large open areas and gardens instead. Also, things like storm water management and planning for an alternative energy source for the entire community (biomass plant, for example) must be considered.

3. What should be developed first in the area?
   It is never too soon for big business to relocate to a new community. In general however, you would need rooftops built before services. But the key to attracting people to a community is knowing who you want to build for and incorporating things that appeal to the target.

4. What is your general view on a development like UMore?
   Anton Nielson (University of Utah) conducted a study showing that there is currently no net new demand for single-family homes in the US. Coinciding with this, in theory we should try to live in the existing footprint, this would be the “greenest” solution. However, since the reality is that new
construction will take place, and it might as well be UMore since its mission is sustainability. For UMore to succeed, it must be different from any other community.

An idea expressed in this discussion is that while the majority of people looking to live that distance away from the cities prefer single-family housing with lots of space, there are already a dozen places just like that in the area. While a minority of the market would be more interested in dense housing like South Minneapolis (i.e. a 10-minute neighborhood), this market is currently not being served and is an example of a unique opportunity to pursue.

5. **What “green” materials or techniques has the Lander Group used in its developments?**
   We’ve used a variety of modular parts – complete house dropped on a site, roof trusses, 10 foot wall sections, cabinetry and bath fixtures that are pre-configured. We also think about how the products were created and try and select products with green production processes.
Overview: Vine Hill Partners specializes in the design and construction of custom homes ranging from $500,000 to $2.0 million in the Minneapolis/St. Paul metropolitan area. Over the past 15 years, Vine Hill has developed over 6,000 lots and over $500 million in land assets. Vine Hill’s philosophical vision is dedicated to sustainable, progressive thinking and innovative building materials and techniques.

Key Insights:
- Green always costs more.
- Need a good school district to drive the market.
- Houses need to be there before commercial development.
- “People don’t want to live together” (referring to affordable housing owner segment and non-affordable housing owner segment).

Interview Notes:

1. **When considering a master planned development, do you feel the developer should try to move forward with one large developer or several smaller developers?**
   For a project as large as UMore, need to limit the risk taken on by the developer by providing options on parcels of land. Developer will want to guide what happens on their piece of land and not have everything dictated by UMore.

   Large developers could do this with great economies but they don’t like to be involved in affordable projects - how to sell them on this would be key.

2. **What “green” materials or techniques has Vine Hill used in its developments?**

   Vine Hill tries to be sustainable and use sustainable or recyclable materials. However, in the current market owners are consistently looking for a short return on investment and thinking for now (no longer than five year outlook). For example, clients are aware of geo-thermal and want to do it until they are told it will cost $40,000. Some technologies are just not far enough along yet to have a short ROI.

   To consider using: cedar roof, recyclable insulation, spray foam for air tightness. Good to try and use vertical space more wisely with really good insulation rather than single level homes.

   Minnesota also does not offer quality incentives for going down this route. In Colorado you get 50% of your investment back immediately from state incentives.
3. When considering development of a new community, do you think it is more important to promote residential development or commercial development first?
Rooftops need to come before commercial developments. But also need to consider that as the market changes, the plan has to change so there must be some flexibility in the plan.
Overview: Schafer Richardson provides quality investment, leasing, management, development, and construction services to the commercial and residential real estate industries in the Minneapolis/St. Paul metropolitan area. Schafer Richardson’s commercial portfolio consists of 21 properties and 1.2 million square feet of commercial space. In terms of construction services, Schafer Richardson has been recognized for its expertise in renovation, redevelopment and tenant improvement projects. Its developments are generally located in Minneapolis’ North Loop and St. Anthony Main Riverfront District areas.

Key Insights:

- Investment in “green” technology can be justified if you use the life of the product as your repayment timeframe.
- HVAC systems are the only technology that can provide a positive return on investment within five years.

Interview Notes:

1. What has the largest impact on the timeline of a development?
   A development’s timeline will change significantly depending on whether the developer chooses to use wood or concrete in the construction of a project. Wood built projects will take less time.

   Development timelines can also be impacted depending on whether the project is a new development on a vacant parcel of land or if it is an infill project. Obtaining new entitlements and zoning can also prolong a development timeline.

2. How can financing impact the development timeline?
   In the affordable housing segment, any project that utilizes low income tax credits will need to allocate at least one funding cycle into the development timeline (if not two). In general, any project that uses HUD financing will also require at least one year to receive final approvals.

3. Does the size of the development (acreage or units) or whether it is “green” or not have any impact on the development timeline?
   Not really. Any multi-unit development that is 50 units or greater could take longer than a typical development. However, it does alter the timeline that much.

   In terms of “green” or not, this has no impact on the development timeline.

4. What is Schafer Richardson doing to make its current portfolio of properties (or new developments) more sustainable or “green”?
   Schafer Richardson has tried to incorporate the following into its portfolio of properties:
• Solar panels on roofs (when incentives are available)
• Car sharing networks
• Innovative storm water treatment and retention systems (the Swedish System)
• Low flow fixtures
• Construction material disposal policies
• Green roofs
• Low VOC paint and stains
• Automatic light switches and timers

5. **When evaluating new technologies and materials what is your payback hurdle?**
   In terms of market rate multi-family housing developments the payback period is the useful life of the product. So long as it provides a positive ROI over the life of the product, Schafer Richardson will consider it.

   In terms of affordable housing developments, we use a five year hurdle rate. As such, high efficiency HVAC systems are the only technology that can provide a positive return on investment within 5 years.

6. **Which technologies or materials provide the biggest “bang for the buck?”**
   Lighting, HVAC, and low flow fixtures. We are also taking a closer look at white roofs.

7. **When developing a new community do you believe it is necessary to have residents before industry or vice versa?**
   You need to have homes and residents before industry, but it’s a close call.

8. **What are current market trends for residential/commercial development?**
   Schafer Richardson sees a strong market for high end multi-family rentals. This, however, is a result of the economic downturn and will likely change with the economy. If the economy improves it wouldn’t be too surprising to see increased demand for condos.

9. **Additional Contacts:**
   • Urban Works Architecture - [http://www.urban-works.com/flash/index.html](http://www.urban-works.com/flash/index.html)  
     Noah Bly – (612) 455-3102
   • LHB - [http://www.lhbcorp.com/](http://www.lhbcorp.com/)  
     Rick Carter - (612) 338-2029
   • Sundial Solar - [http://www.sundialsolarenergy.com/](http://www.sundialsolarenergy.com/)  
     (612) 926 - 8506
Interviewee: Avery Seavey  
Company: Blue Sea Developers (contact found with New Ecology report)  
Date: Thursday, April 21, 2011

**Overview:** Blue Sea Construction Corp is a privately held developer/builder headquartered in New York, NY. Established in 1993 Blue Sea Development focuses on the development of market rate and affordable, multi-family housing project. It has been building all of its developments to Energy Star standards for the past ten years and in 2007, received its first certification (LEED-H Silver) for 76 units of affordable ownership housing in the South Bronx. In 2009, it developed and built The Eltona, the first affordable rental LEED Platinum building in New York State.

**Key Insights:**

- In order to help make homes affordable for low income earners, consider creating multi-family housing and allowing for part of the unit to be used for rental income for the home owners.
- City needs to provide most of the assistance for developers building affordable homes.
- Green features are most often seen as “sexy” features by investors and not necessarily being requested by the future home owner.

**Interview Notes:**

1. **What are some of the top ways developers can add energy efficiency to homes?**
   Low e-glazed glass, painting the roof white, low VOC paint, recycled carpet, and placing AC units in a window so you don’t penetrate a building’s skin can provide great returns for home owners and do not have high upfront costs.

2. **Why might developers want to create in energy efficient homes?**
   We typically do not get any additional financing for creating energy efficient homes but we think of it as a way to differentiate ourselves from our competition and to build our brand.

3. **What are some of the ways UMore can try to get more financing to develop the energy efficient, affordable homes?**
   Think about leveraging federal programs which give tax benefits to large institutions that provide financing and give money to developers that are developing these types of homes.

4. **What are some of the major challenges you foresee UMore having to overcome in order to make this community successful?**
   For the affordable home community, infrastructure is key! Need to ensure they have efficient means of getting around their community and to/from work and that won’t break their bank while doing so. Also, UMore has to think about how they are going to get past the environmental issues so they can continue to attract home owners.
Interviewee: Geof Syphers, Independent Consultant
Date: Tuesday, April 26, 2011

Overview: Geof is an independent consultant providing management and technical assistance for designing green buildings and planning sustainable neighborhood developments. He works with owners, investors, and design teams to achieve sustainability on individual buildings and whole neighborhoods. His projects feature low parking rations, town squares, deep energy efficiency, solar, biomass and geoechange, net zero water, affordable housing, zero waste construction, eco-concierge services, food gardens and car sharing clubs.

Key Insights:

- It’s not just the organization it’s the people at the organization that are critical for selecting a master developer.
- Need to think about what will make this development different.
- Shared walls don’t lose energy – more row houses, condos, and flat will provide greater energy efficiency.
- Challenge with UMore Park is creating a sense of place – it’s not very close to other things so it needs to have a strong identity and a job base.

Interview Notes:

1. **What kind of master developer relationship needs to be put in place to support this type of project?**
   Need a master developer who is open to exploring the types of technologies and processes that UMore Park wants to incorporate into the community. Must have someone in a leadership role or project management seat that has an ability to work on things he/she does not know the answers to and be able to work on multiple paths/ideas concurrently. Find someone who thinks completely differently.

   Anytime you’re building something that is different or unproven, the first thing you put in the ground provides a signal to what you’ll be doing. With this in mind, many larger, national master developers would not be interested in this type of project. Bring them on for a small portion of the initial phase to prove out the community and make sure they can respond to the market and are not just tied down to doing one thing right away if the market doesn’t demand it.

   The U of MN should challenge the master developer to think about the green technologies and present sustainability requirements.

   The master developer’s role should be to solve the challenges in the financial world in which the develop lives.
2. **When considering development of a new community, do you think it is more important to promote residential development or commercial development first?**

   Don’t think about this yet – need to complete the full master plan first. This will come out in the future. Can start thinking about what’s needed on the site today – what does Rosemount need or the Dakota Technical campus need?

3. **Which technologies or materials provide the biggest “bang for the buck?”**

   Think about materials at the site scale before even getting to the building – street alignments and orientation determine what materials to eventually use for buildings.

   Consider mass production solutions over natural solutions because of the scale of this project. Steel frame passive wall sections – non-combustible (can have narrower streets). Can setup a temporary factory to produce and creates jobs.

   What waste is present in Minnesota that can be used in an alternative form as a building material for the project? Keep things out of landfills and provides a nice story to start building brand. Master developers will be on board to this as long as material reuse is certified.

   Insulation value of building is only as good as the windows – invest more in glazing and simplify walls and roofs.

4. **Opinions on high-density vs. low-density building:**

   Need to consider how you make a high-density area more comfortable for people who are used to a suburban community. How do you get the benefits of urban living but still have a view of the mountains?

   This tends to translate in the use of materials. Examples:
   - **High-end:** Plaster over ply-wall costs twice as much but creates a new look and feel that appeals to people in the market.
   - **Mid-range:** German-style windows cost much more but people love them and energy savings is great.
   - **Affordable units:** Durability and maintenance is key – use solid wood doors and solid maple cabinets with quality hinges (stuff that doesn’t break) – additional cost is low compared to perceived benefit.

5. **What are current market trends for residential/commercial development?**

   Across the U.S., developers are beginning to get projects mobilized for development in the next 10-12 months – but they’re doing this because they don’t know what else to do. The market isn’t really ready for more development. Geof believes it will be a very gradual residential market over the next 5-7 years.

   For UMore Park, because it’s such a large project, you could still start building earlier but build what the overall community needs (i.e. close to Dakota Technical College). Use the time to focus on master development and trying to determine what can be located here – be creative, make it a destination. Food is also important. You don’t need a house in 3-4 years. And a good master developer should agree with this.
Interviewee: Steve Wellington, President
Date: Thursday, March 17, 2011

Overview: Wellington Management, Inc. owns and manages a $375 million portfolio of 88 commercial properties in the Minneapolis/St. Paul metropolitan area. Their portfolio consists of 3.9 million sq. ft. of office buildings, shopping centers, and industrial buildings which provide space for over 625 tenants in 19 different urban and suburban communities. Wellington is the 15th largest manager of commercial property in the metropolitan area.

Key Insights:

- A successful development does not depend on a developer, it depends on the market.
- Affordable housing projects generally can’t use traditional bank debt in their capital structure.
- Solar, wind, and geothermal energy systems don’t provide a sufficient return to justify the investment.

Interview Notes:

1. **What financing products are typically used on affordable housing developments?**
   Developers will obtain any financing that is available, so long as the restrictions and reporting requirements are not too cumbersome. Most sources take the form of tax increment financing or tax credits.
   - Tax increment financing (TIF): A public financing method which has been used as a subsidy for redevelopment and community improvement projects. TIF is a method to use future gains in taxes to finance current improvements (which theoretically will create the conditions for those future gains). (Definition source: Wikipedia)
   - Low Income Tax credits: Financial incentives granted to developments of low income housing where tax credits are granted to the development and then syndicated to investors (in return for equity capital) who receive dollar-for-dollar credits against federally taxable income.

2. **When financing an affordable housing project, how often is traditional debt used as a source of capital?**
   Projects that accommodate residents at 30% - 50% of median income typically can’t use traditional bank debt because monthly rental revenue is not sufficient to cover debt payments. As such, these projects rely heavily on government incentives and finance programs. Typically, any affordable housing project will require at least 4 – 6 funding sources.

   As rents increase for a project it can afford to take on more debt. Projects with monthly rental rates of $1,000+ can service some level of debt. Typical affordable housing projects with monthly rental rates of $300 - $500 won’t be able to service debt and will rely on other sources of capital.
3. **Comment on incentive programs for affordable housing or “green” development.**
   Incentive programs come and go, so it is difficult to anticipate what funding programs will be available in the future. However, it is considerably more difficult to find incentives for “green” development than affordable housing.

4. **Where should developers focus their efforts in terms of incorporating “green” building materials or techniques?**
   Developers should focus their investment on mechanical systems and lighting. These provide the most “bang for the buck” today while maintaining a reasonable payback period.

5. **Does Wellington incorporate solar panels, wind turbines, or geothermal systems into its properties?**
   No, at this time they have far too long of a payback period to justify the investment.

6. **What is the outlook for the commercial and residential markets?**
   There’s been some improvement in the residential markets. Commercial, however, currently has 4 – 6 years worth of pent up inventory in many areas.

7. **When considering a master planned development is it necessary to have one large developer/builder or several smaller developer/builders?**
   It really doesn’t matter. “A development does not need a major developer, it needs a market.”

8. **Do you foresee any difficulties in promoting the UMore Park project?**
   Transportation could be a major issue for the development and its residents.
Overview: Gonyea Companies is a privately held real estate developer/builder focusing on custom residential construction/developments in the Minneapolis/St. Paul metropolitan metro area.

Key Insights:

- Developments should only be undertaken if there is a market for the development.
- Location near a reputable school district is critical for any new development.
- Master planned developments should utilize multiple smaller developers as compared to one large developer so the development has a differentiated product.

Interview Notes:

1. What “green” materials or techniques has Gonyea used in its developments?
Homes are typically built to the customer’s design (non-speculative). Therefore, the level of “green” materials in the home is at the buyer’s discretion. Recently, buyer requested that their home incorporate geothermal heating via a ground source heat pump. This was the first time Gonyea incorporated geothermal into one of its homes.

2. When evaluating the return on investment for a particular product or system, over what time period is the investment analyzed?
Most developers/builders will look at a five year time frame. Some may extend to a seven year timeline, but that’s a stretch in this environment.

3. When considering “green” products or building techniques, what provides the most “bang for the buck”?
Any product, material or building technique that can decrease the home’s reliance on energy, thus cutting the monthly utility bills.

The Minneapolis Home Show recently featured an idea home that used structured insulated panels ("SIP’s") for the exterior structure. The prefabricated components not only decrease construction time (and thus labor) but also are said to create a much tighter building envelope.


4. When considering development of a new community, do you think it is more important to promote residential development or commercial development first?
Homes need to come before commercial space can be developed. It would be ideal to have a large corporation re-locate to the area to help spawn residential development, however, that’s unlikely. More often than not, residential will come first and then commercial space and large corporations will follow.
5. **When considering a master planned development, do you feel the developer should try to move forward with one large developer or several smaller developers?**
   In order to provide differentiated products and appeal to a wider market, master developer should consider using several developers.

6. **What is your outlook for residential development over the next three to five years?**
   It’s too uncertain to tell. There is still a significant amount of inventory and undeveloped lots in the system. Markets located near highly regarded school districts will continue to be hot; however, the rest of the market will take a while to recover.
Appendix C: Research Sources


• “Improving Building Energy Codes.” Building Energy Efficient Codes Network and Alliance to Save Energy.


- Utopian Cities, www.google.com/images?hl=en&q=Utopian+cities&um=1&ie=UTF-8&source=univ&sa=X&ei=zqJ2TdihAsK60QHZm8zfBg&ved=0CDMQsAQ, March 21, 2011.


UMore Park: Planning for a New Energy-Efficient Affordable Community

Carlson Ventures Enterprise Team
Joel Fischer
Ana Hawkins
Keith Lindgren
Ceci Marn
Agenda

- Introductions
- Project Scope
- Research Methodology
- Synthesis of Findings & Recommendations
A Little Bit About Us

Joel Fischer has a background in banking. He is pursuing a Finance concentration at Carlson.

Ana Hawkins has a background in consulting. She is pursuing a Strategy and Marketing concentration at Carlson.

Keith Lindgren has a background in chemical research. He is pursuing an Entrepreneurship concentration at Carlson.

Ceci Marn has a background in healthcare software project management. She will be moving into education reform upon completing her MBA at Carlson.
Agenda

- Introductions
- Project Scope
- Research Methodology
- Recommendations & Synthesis of Findings
Project Scope

To investigate the key elements that will help make a compelling case to future residential developers that energy-efficient affordable housing is feasible.
Agenda

- Introductions
- Project Scope
- Research Methodology
- Recommendations & Synthesis of Findings
Methodology

- Articles/Online Research (50+ Sources)
- Industry Experts (7 Interviews)
- Developers/Builders (7 Interviews)
- Planners (2 Interviews)
- Architects (2 Interviews)
Insight Themes and Recommendations

- Energy-Efficiency
- Market Demand
- Planning
- Developer Partners
Energy-Efficient Technologies

What technologies offer the biggest bang for the buck?

- Low-E glazed windows, super insulation, lighting, well designed roofs, and water efficiency.

The cost of materials will decrease with time.

- Energy-efficient materials will become more affordable in the future (solar shingles, solar panels, geothermal, and SIPs).
Looking beyond energy efficiency technologies.

- Energy efficiency is a holistic endeavor that requires tradeoffs.
- Energy efficiency is only part of a more sustainable approach that considers the overall carbon footprint of a project through its entire life cycle.

Can affordable housing be sustainable?

- Yes! But there is some discussion about what that means.
- Green Communities Criteria currently governs affordable housing. This is a good start, but these expectations can be exceeded with the right partner.
UMore Park should pursue an outcome-based approach with developers and builders in order to ensure that its buildings and houses are sustainable.
Insight Themes and Recommendations

- Energy-Efficiency
- Market Demand
- Planning
- Developer Partners
Economic Trends

“There is too much inventory of conventional housing in a suburban setting.”
~Michael Lander, Planner

In recent years, housing demand has been driven by the desire to live in high-quality school districts.
~Cory Lepper, Builder

“A successful development does not depend on the developer, it depends on the market.”
~Steve Wellington, Developer
Market Challenges

Developers are skeptical regarding whether people will pay a premium to live in a sustainable community.

- UMore Park has to show developers that there is demand or demonstrate that sustainable homes are not more expensive.

Having energy-efficient homes is at odds with having typical market-rate suburban homes.

- Must reconcile what you want to do with what has had historical success in the market.
Who Will Live in the Community?

- Market Rate Vs. Affordable
- Single Family Vs. Multi-Family
- High Density Vs. Low Density
- Energy-Efficient Vs. Conventional
- Income Driven Vs. Mixed Income
- Urban Vs. Suburban/Rural

UMore Park
University of Minnesota Outreach, Research and Education Park
Meeting and Creating Market Demand

Develop a prototype house that meets sustainability outcomes and proves the vision is achievable at an affordable price point.

Dakota County affordable housing residents live and work in Dakota County. Transportation needs to be considered for affordable housing residents.
Assess the overall market demand in light of sustainability goals. Work with your developer partners to focus initial efforts around a project that can demonstrate demand for UMore.
Insight Themes and Recommendations

- Energy-Efficiency
- Market Demand
- Planning
- Developer Partners
What Should be the Focus of UMore?

“Without proper planning, UMore will be just another community development with energy-efficient homes and car dependent residents.”

~Lucas Alm, Architect

Suburban markets are over saturated with inventory

Success in today’s market depends on differentiation and demand

Differentiation will come from sound planning and innovative design

“If you only think green for the building then you’re too late... most environmental impact comes from planning.”

~Michael Lander, Planner

UMore Park
University of Minnesota Outreach, Research and Education Park
Focusing on a Particular Technology or Material Should be Tied into the Design Plan

Large systems are dependent on the size of the house and its energy consumption.

Energy consumption is then dependent on the size and type and layout of the windows.

Energy gained and consumed by the windows is dependent on the position of the house on the street.

The house layout is then dependent upon the layout of the streets in the development.

Thus, it all ties back into the community and building design.
Recommendation for Planning

Spend the next 3-5 years planning the UMore Park community. Designing the buildings will depend heavily on the community and building types.
Insight Themes and Recommendations

Energy-Efficiency

Market Demand

Planning

Developer Partners
How Master Developers and Builders Create Value

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<td>Acquisition</td>
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<td>Zoning &amp; Entitlement</td>
<td>• When necessary, rezone and entitle the land for a new use that will result in a higher valuation.</td>
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<tr>
<td>Pre-Development</td>
<td>• Construction of common infrastructure for the development.</td>
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<tr>
<td>Development</td>
<td>• Construction of commercial or residential units.</td>
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<tr>
<td>Sales/Lease Up</td>
<td>• Ability to market, sell, or lease finished product to end users or investors.</td>
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Which Master Developer and Builders Should UMore Work With?

**Master Developer**
- Find a master developer who wants to work with UMore to define its goals and standards for the community.
- Find a master developer who is willing to build the first phase of UMore, prototype and/or services.

**Builder(s)**
- Work with the builder to see what makes the most sense.
- A large national builder has the most leverage to reduce building costs.
- Multiple smaller builders can offer greater variety in terms of product mix and design.
How Can You Find the Right Master Developer for UMore?

- Actively seek out developers who have experience with energy-efficiency and affordable housing.
- They should not be focused on how long it will take to begin construction.
- UMore needs someone who drives to innovate rather than falls back on experience.

Find a master developer who is concerned with UMore’s planning & design.

UMore needs someone comfortable with answering the unknowns.

Do not create an RFQ and wait for master developers to come knocking.
Aeon is a nonprofit developer, owner and manager of high-quality affordable apartment homes in the Minneapolis/St. Paul metropolitan area. In 25 years of development, Aeon has built or renovated over 1,780 townhomes and apartments.

Lander Group is a real estate developer focusing on planning, designing, and managing urban development projects. They prefer to focus on “building great neighborhoods” or “place-building.”

LHB is a multi-disciplinary engineering, architecture, and planning firm known for their design leadership. They are dedicated to being environmentally responsible, reducing long term operating costs, and improving the quality of life for their clients.
As a non-traditional project UMore Park requires non-traditional development partners. Find partners who share your vision and bring innovative ideas.
Summary of Recommendations

**ENERGY-EFFICIENCY**
UMore Park should pursue an outcome-based approach with developers and builders in order to ensure that its buildings and houses are sustainable.

**MARKET DEMAND**
Assess the overall market demand in light of sustainability goals. Work with your developer partners to focus initial efforts around a project that can demonstrate demand for UMore.

**PLANNING**
Spend the next 3-5 years planning the UMore Park community. Designing the buildings will depend heavily on the community and building types.

**DEVELOPER PARTNER**
As a non-traditional project UMore Park requires non-traditional development partners. Find partners who share your vision and bring innovative ideas.
### HEAT PUMP EFFICIENCY TABLE

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- **HEAT PUMP EFFICIENCY TABLE**
- **TYPICAL MIDWESTERN HOME ENERGY USE**

#### Carnot Efficiency
- 60%

#### Average Price of Electricity
- **per KWH**: $0.1190
- **per MBTU**: $35.19

#### Average Price of Natural Gas
- **per 1000 cubic feet**: $11.00
- **per MBTU**: $14.10

1 cubic foot = 1 MBTU (78% furnace efficiency assumed)

#### TYPICAL MIDWESTERN HOME ENERGY USE

<table>
<thead>
<tr>
<th>USE</th>
<th>MBTU/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Heating</td>
<td>61.2</td>
</tr>
<tr>
<td>Electric Air Conditioning</td>
<td>6</td>
</tr>
<tr>
<td>Water Heating</td>
<td>16.8</td>
</tr>
<tr>
<td>Refrigerators</td>
<td>5.2</td>
</tr>
<tr>
<td>Other</td>
<td>23.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>112.6</td>
</tr>
</tbody>
</table>

**Target Market (Heating)**: 78
**Target Market (Cooling)**: 6

**Energy savings if house is energy efficient**: 20%
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax credit for Heat Pump</td>
<td>30%</td>
</tr>
<tr>
<td>Cost of Heat Pump</td>
<td>$ 6,500.00</td>
</tr>
<tr>
<td>Tax Benefit</td>
<td>$ 1,950.00</td>
</tr>
<tr>
<td>Discount rate for consumers</td>
<td>4%</td>
</tr>
<tr>
<td>Average electricity escalation rate over term</td>
<td>1.78%</td>
</tr>
<tr>
<td>Average natural gas escalation rate over term</td>
<td>2.53%</td>
</tr>
<tr>
<td>Cost of capital for Utility</td>
<td>6%</td>
</tr>
</tbody>
</table>
Only the Cells in Green formatting on this spreadsheet should be changed, the results will change automatically to reflect the new input data. Don't change any other cells on other spreadsheets.