Madison Terminal Market Final Report

AUGUST 20, 2020

HEALTHY RETAIL ACCESS PROGRAM

Madison Food Policy Council

ACDS, LLC | P.O. BOX 6666, COLUMBIA, MD 21045

Acknowledgments

ACDS wants to thank the members of the local team that committed time and energy to ensure the success of this project.

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We also want to thank the City of Madison, the Madison Food Policy Council, and the Healthy Retail Access Program for providing funding and policy support for this project.

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Purpose of the Project

In early 2019, the City of Madison embarked on a two-phased project that would explore the feasibility of a food-terminal cross-docking facility in the first phase with the second, conditional phase developing the business model and exploring the economic and community impacts of the Madison Terminal Market. By summer 2019, the feasibility study identified a set of local and regional food system needs in the fifty-eight county study area that required a more sophisticated and nuanced approach to market development, if the Market were to satisfy critical needs such as:

- Improving local and long-haul transportation conditions.
- Reducing the costs of last-mile delivery.
- Increasing rural and urban community access to fresh foods.
- Enhancing the competitiveness of local businesses relative to their regional and national competitors.
- Increasing the diversity of fresh products available in the marketplace.
- Improving the representation of locally produced foods in regional and national supply chains.
- Adapting to new federal food safety and transportation regulations.

To address these and other important issues, the project team focused on innovative means to employ the most critical characteristics of terminal markets. With a nuanced and collaborative approach, the project created a solution to develop those characteristics—which include increased trust and transparency, improved supply chain collaboration, diverse community participation, shared operating costs and greater product choice—without building a traditional terminal market.

As a result, the project team developed several market-based approaches to respond to identified needs. Each recommendation can stand alone, but the goals would be enhanced if implemented in an integrated and cooperative manner. The Technical Memoranda section of the report below includes memos describing each segment. The Integration of Technical Solutions memorandum describes the relationships between each of the segments.

Additionally, the project team developed a vision that will remain a part of the project as it moves forward. That shared Wisconsin Terminal Market Vision is to make sustainable, local food production viable at scale, with positive outcomes for businesses, consumers, and the agricultural sector, while defining Wisconsin as the national hub for food system and agricultural innovation

Outcomes of the Project

The project team, through site visits, interviews across the food value chain, data analysis and focus groups, developed a solid understanding of the food supply chain across the region. After the project team presented the findings to the local team, they realized that

the complex solutions needed to be laid out in a more segmented manner. As mentioned above, the project team chose to write technical memos explaining each segment of the solution.

Following that are the technical memoranda distributed to the local committee:

1. Flex Cold Storage Needs and Solutions – Low density
2. Quasi-Last Mile Delivery and Refrigerated Locker Solution
3. Business Service Needs and Solutions
4. Technology Needs and Solutions
5. Flex Food Manufacturing Needs and Solutions
6. Flex Cold Storage Needs and Solutions – High density
7. Madison Terminal Market Public Benefit Corporation Value Statement
8. Community Impact Analysis

Collectively the memos present the initial business concepts that respond to the market needs and opportunities identified up to this point. ACDS and the local committee continued to refine the solutions to the needs and opportunities through July 2020.

Based on the findings of these memos, the local team is developing responses to implement the study's recommendations. The first was a business plan for a quasi-last mile food delivery pilot project. That document, as well as others, have been developed and submitted responding to possible funding opportunities for both short-term emergency response and long-term project development. Other documents include a memo on the results of a community impact study that uses IMPLAN analysis to estimate the economic impact on the region, based on business creation and expansion and a one-pager describing a Covid-19 emergency response to support a funding request.

Proposals have already been submitted to federal, state, and regional organizations as well as non-profits. Those include the USDA Local Food Promotion Program, the Robert Wood Johnson Foundation, Wisconsin Partnership Program, and US Economic Development Administration Coronavirus Aid, Relief, and Economic Security (CARES) Act funding, and a proposal to the Wisconsin Department of Agriculture, Trade, and Consumer Protection. Additionally, private funders are already indicating interest in supporting portions of the project. This step includes the establishment of a B Corp as a possible management organization, so the local team has written and agreed on a vision statement to support that effort.

In the meantime, Covid-19 regulations have impacted developing the physical assets envisioned, while also leaving relevant actors prepared to swiftly implement a smaller-scale "pop-up" solution with a robust digital platform. The Terminal Market is imperative for emergency response in the short-term and may serve as a proof-of-concept for a new farmer-driven distribution model while a permanent facility is under development. As mentioned above, the local committee continues to respond to ongoing funding opportunities.

COVER MEMORANDUM

DATE: **SEPTEMBER 4, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **INTEGRATION OF TECHNICAL SOLUTIONS FOR THE MADISON TERMINAL MARKET PROJECT**

This memorandum intends to provide an overarching context for the technical memoranda distributed to the local committee:

1. Flex Cold Storage Needs and Solutions
2. Flex Food Manufacturing Needs and Solutions
3. Technology Needs and Solutions
4. Quasi-Last Mile Delivery and Refrigerated Locker Solution
5. Business Service Needs and Solutions

Collectively the memos present the initial business concepts that respond to the market needs and opportunities identified up to this point. ACDS and the local committee will continue to refine the solutions to the needs and opportunities through October 31, 2019. The refined responses will allow the project to move into the next phase with a solid basis for business modeling.

Purpose of the Project

Radical changes happening in the food system are impacting all levels of the food supply chain, from farmers to distributors to consumers. Consumers are demanding more discrete types of food, including organic, local, GMO-free, and allergen-free, among others. New food safety regulations and labor issues are impacting businesses from farmers to retailers. Distribution companies and farmers must conform to new and complicated transportation rules. These issues and others affect how food moves to, from, and through the region.

Along with the changes to the food system nationally and internationally, issues particular to Madison add a layer of complexity to the situation:

- Demographic changes
    - Bifurcation of income and wealth
    - Increased urban density

- Consumer demand
    - High demand for home delivery
    - Large number of mobile device users
    - High demand for organic products
- Transportation
    - Impact of amended federal regulations for local and long-distance trucking
    - Difficult local traffic and parking conditions
- Labor conditions in the food industry
    - Poor food industry skills
    - Low labor retention rates
- Poor food access to nutritious food for low income and disadvantaged populations
    - Equity in bifurcated market
    - Food deserts

The City of Madison recognized that gaps in the system are preventing food from flowing efficiently from the farmer to the end consumer for myriad reasons. It is understood that there is a need for physical infrastructure that replicates the functions of a terminal market. Those include things like multiple tenant capability, climate-controlled storage, local logistical support, load aggregation and disaggregation, minimal processing, picking and pulling, increased food access, and improved efficiency for small businesses.

How is ACDS working through the issues?

The project team began by gathering raw data regarding food production, consumption, and logistics, among others. A summary of the research data can be found in Appendix A, attached hereto. Then the team conducted more than 50 in-person interviews of farmers, distribution company representatives, retail store and restaurant owners, and researchers. The team used all sources to determine the answers to several questions:

- How and what products move from the farmer to the consumer?
- What do consumers (thus retailers and restaurants) demand in Madison and regionally?
- What can local and regional farmers produce to fill that demand?

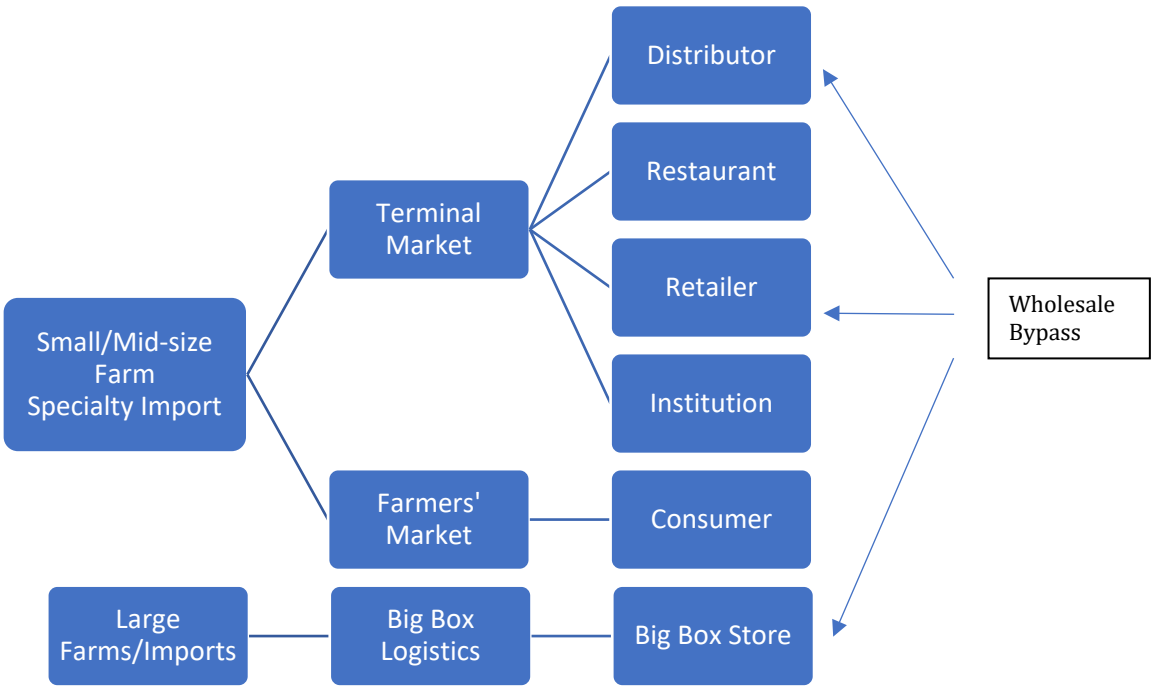
Additionally, because an existing site might be part of the solution, ACDS is analyzing the possible use of part of the Oscar Mayer campus, looking at its strengths and weaknesses, and comparing it to other potential sites in the city.

ACDS believes that the needs of the market drive business responses. The recommendations addressed in the technical memoranda reflect that belief. Current recommendations may change in focus or scope because research is ongoing. As the project team finishes Phase 1 of this project, it will remain open to new issues that may require a different solution.

What is a Terminal Market?

Terminal markets are centralized locations, mainly in urban areas, where fresh food arrives in bulk quantities, gets broken down into smaller lot sizes, and then is distributed retail operations like stores and restaurants.

Today, as large retail and institutional buyers desire more centralized control of their food supply; they bypass terminal markets by using their own internal distribution systems. This process, which is referred to as wholesale bypass, has resulted in a loss of volume at terminal markets. The process has reduced market access for small to mid-size farms that rely on terminal markets as a source of liquidity. Finding new solutions to marketing perishable foodstuffs in a manner that is equitable, transparent, and fair is, therefore, a central theme of this project.



Terminal markets are an essential link in the supply of fresh food to metropolitan areas. They work well because large numbers of buyers and sellers can come together to buy and sell. These centralized facilities aggregate large volumes of food from both local farms and far off import markets, bringing in both bulk commodities and specialty foods. Once on the terminal market, the bulk shipments are broken down into manageable sizes and offered for sale in a competitive, open-air sales environment that makes buying and selling easy and transparent. Small businesses can readily access the market, where they can view the products, negotiate price among the competitive wholesalers, and assemble small diversified loads from both the commodity and specialty sectors.

The very nature of the transaction system present on the nation's terminal markets brings many advantages to those who use the markets, which are listed in the following table.

Advantage	Description
Information exchange	Trust in terminal markets is built by the nearly immediate exchange of information occurring through the hundreds or even thousands of interpersonal contacts made during the day. When information exchange is symmetrical, meaning all parties have the same information at the same time, the marketing system is not biased against one set of participants.
Price discovery	The open-air transaction environment on terminal markets allows for market participants from farms through wholesalers and buyers to understand the pricing structure of the commodities being traded. The wholesale bypass system does not allow for this type of transparency.
Network development	Because terminal markets encourage the physical mixing of many elements of the supply chain, they are in a place where the positive benefits of collaboration and competition are seen on a regular basis.
Liquidity enhancement	Terminal markets rely heavily on fast settlement of transactions based on the strength of the established relationships. This speed means farmers typically receive payments as cash settlements or within days of the transaction, rather than 30 or 45-day terms offered by the larger system
Efficiency	Terminal markets are characterized by high product turnover rates and high levels of proficiency in breaking bulk shipments into small orders. The efficiency allows markets to be competitive in servicing small accounts with limited order volumes. Large distribution companies often charge surcharges or minimum order volumes to service the same clientele.
Product diversity	Terminal markets are characterized by the variety of the wholesalers and buyers that utilize the markets, so they provide diverse products ranging from ethnic specialties to organic products. Terminal markets, as a whole, often offer many more SKU's than a standard food distributor.

This project focuses on replicating the positive aspects of the terminal market for locally and regionally owned farms, distributors, wholesalers, retailers, restaurants, and other supply chain participants. Given the trends in distribution and wholesaling activities, supporting these characteristics may require innovative approaches to redefine terminal markets.

Project Status

Phase 1 of the Madison Terminal Market Project is a process of discovery during which the project team investigated consumption patterns, industry trends, community needs, and freight movement. Through interviews, data analysis, and site visits, the team developed recommendations to address weaknesses in the local food system. The team determined that the gaps in the food supply chain in Madison call for a cooperative business model that provides an integrated solution which includes facilities, business services, technology solutions, and improves consumer access. This business may own and operate facilities, manage and coordinate business services, license technology solutions, and expand consumer access with new pick-up and delivery options.

The purpose of the cooperative style business model, and its suite of solutions, is to enhance market access, efficiency, and profitability of its members while providing a public benefit of improved food access and social equity in Madison. Members could include farmers, distributors, manufacturers, and retailers.

The proposed model includes solutions that address needs for farmers, manufacturers, distributors and wholesalers, and retailers. Weaknesses noted in the analysis of the food system are transportation system weaknesses; lack of cold storage; need for processing space, particularly for allergen-free products and specialized supplements; and improved technology integration across the supply chain.

The project team developed four technical memos to discuss the five aspects of the project recommendations more fully. However, as supply chains are interconnected, so are each of the solutions recommended. Cold storage will integrate with transportation from the farm as well as local and regional delivery. Commissary, if integrated into the terminal market design, would be housed in a space collocated with cold storage, allowing manufacturers access to storage for distribution to retailers and restaurants. Technology solutions would connect farmers to wholesalers, wholesalers to retailers, and retailers to consumers. Delivery services and locker solutions would provide increased convenience and access to consumers. Business services would be available to all of the members and outside businesses to enable improved performance.

Relationship of Core Elements

The five business concepts being advanced in the attached Phase 1 memoranda should be considered as an integrated set of solutions to achieve the benefits of a terminal market. While ACDS, LLC feels strongly that these solutions be offered through a cooperative management structure, each could stand alone or be absorbed into an existing business by addressing a specific set of needs within specific segments of the supply chain.

	Cold Storage	**Commissary**	**Business Services**	**Locker System**	**Technology Solutions**
Agricultural Production	X	X	X	X	X
Manufacturers & Processors	X	X	X		X
Wholesale Distributors	X	X	X	X	X
Food Retail & Services	X	X	X	X	X
Consumers				X	X

Technical Memoranda – Business Concepts

TECHNICAL MEMORANDUM

DATE: **OCTOBER 15, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **LOW DENSITY COLD STORAGE ALTERNATIVE FOR THE MADISON TERMINAL MARKET PROJECT**

This memorandum offers an alternative design program to the August 26th Cold Storage memo. It presents a low-cost, low-technology alternative to the proposed logistics model. The low-density model is also intended to support the local needs of farmers, retailers, distributors, and wholesalers seeking short to mid-term storage and cross-docking operations with local distribution support as they relate to the purposes and objectives of the Madison Terminal Market Project.

This memorandum also reflects the recent and unexpected suspension of the DOT 14-hour rule and the expected delay in the implementation of the DOT electronic logbook (ELB) requirements. Any permanent changes in these two rules may have a significant impact on facility demand by large regional and national logistics companies.

With the above in mind, this memorandum offers an alternative design that serves current local demand while offering a testing ground for local and long-haul logistics support and technology implementation. Due to the unexpected change in logistics regulations, this memorandum offers interim findings only.

The memorandum is structured to introduce critical data regarding the state of the industry both nationally and locally, followed by an analysis of the specific local opportunity. It concludes with a brief financial analysis of the costs of new construction as well as estimates of operating revenues and costs as required to satisfy the demand projections. This analysis is offered at the magnitude of cost level and is intended to help make a determination of "Go" or "No Go" on further research.

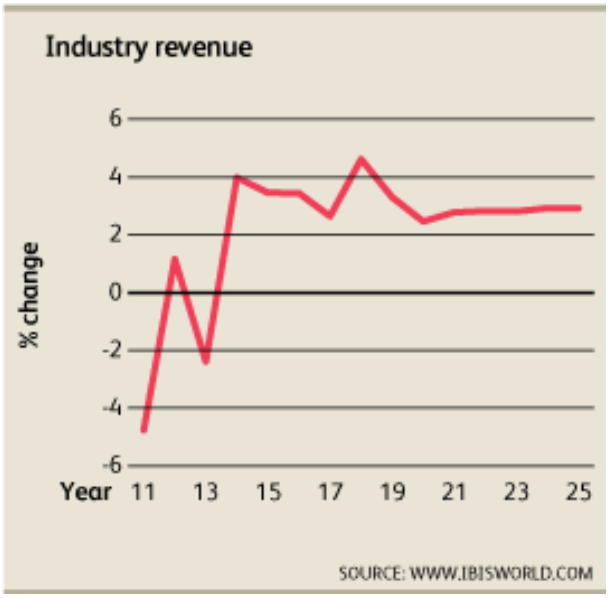
General Industry and Market Analysis

The Industry

The refrigerated storage industry had $5.5 billion in sales revenue in 2018, yielding 16 percent earnings before taxes, interest, and amortization[1]. The 56-county study region has $68 million in revenue, and Dane County operations see $17 million[2]. The industry is mature but growing and is made up of more than 1700 distinct operations nationwide, with 54 being in the study region and 5 in the county. The number of new operators entering the business each year grows at approximately 2.8 percent annually, which is up from 1.6 percent five years ago. While small players dominate the industry, increased merger and acquisition activity is evident as larger players consolidate to take advantage of efficiency improvements in facility design and operations.

Industry performance is driven by five key external factors:

1. Consumer spending – growth in spending on food increases demand
2. Total trade value – higher values of both imports and exports increase demand
3. Agricultural price index – declining prices results in more demand for storage
4. E-commerce sales – movement in and out of warehouses increases handling revenue and local fulfillment requirements for perishable foods
5. Freight transportation services index – increase in demand for shipping coincides with an increase in demand for warehousing which has been exacerbated by DOT rule changes and the reduction in refrigerated freight capacity



With the increase in service offerings and a technological capability that fits within client enterprise resource planning (ERP) systems, refrigerated warehouses are becoming more popular as a flexible storage option for manufacturers, wholesalers, and rapid order fulfillment operators working with online grocers. These market changes are enhancing demand for flexible cold storage options. Such options can be an integral part of the supply chain for companies that want to focus investment on core activities such as procurement, quality control, and customer acquisition.

[1] IBISWorld Industry Report 49312 Refrigerated Storage in the US, Dan Cook, August 2019
[2] Hoovers

Operators can succeed by providing well-positioned flexible storage in a high-density format with the ability to offer inbound and outbound services such as blockchain, multi-party food safety programs, order picking, repacking, freezing, and thawing.

Retailers and farmers are a secondary but critical market for public or shared cold storage. These two groups are driven by very different market fundamentals. Retailers are adapting to new store formats and online offerings that require access to flexible warehousing options. Small retailers, in particular, are burdened by the extra ordering costs associated with broken lot shipments and are unable to take advantage of lower-cost purchasing options because they lack cold storage warehousing. Farmer based demand tends to be seasonal. Farmers are using public cold storage to extend the marketing period for crops and are increasingly engaging in value-added processing that requires long-term cold storage for products such as fruit and vegetable purees.

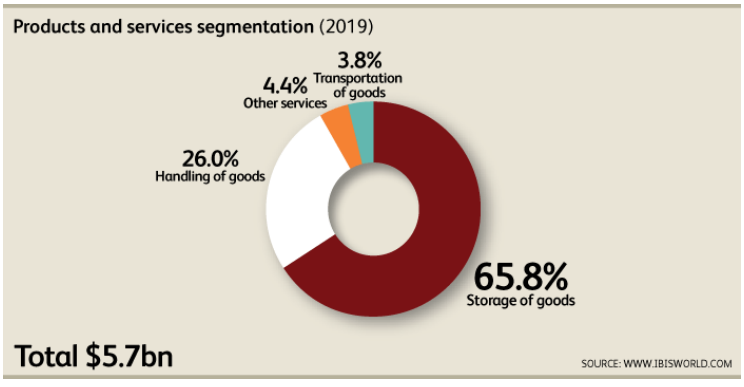
To meet the additional demands for value-added services, flexible cold storage operators have vastly expanded the ala carte services they perform, have reprogrammed their ERP systems, and expanded workforce capabilities to become more firmly established as critical players in the supply chain. In this expanded role, cold storage operators are adding front- and back-end capability through services offered by the operator or through third parties. Key among these services are repacking, packaging, labeling, blast freezing, thawing, minimal processing, food safety programming, blockchain order fulfillment, cross-docking, local/long-distance transportation, regulatory filings, truck staging, and others as needed.

Proximity to the user base or fit within their logistics networks is also essential. Requirements for market proximity have caused a shift in the geographic location of cold storage facilities over the last five years, which is evident in the regional market. These factors combine to yield an overall favorable outlook for the industry with continued investment and growth over the next five years.

The Market

The refrigerated warehouse segment is characterized by steady demand created by myriad forces that mirror the general economy. This is largely due to the products and services that the industry sells. These can be broken down into three broad categories:

1. Storage of goods
2. Handling of goods
3. Transportation and other services



The chart to the right depicts the market segmentation by revenue. Storage of goods is the simple

outsourcing of pallet, bin, and other bulk forms of cold storage on a short- or long-term basis and accounts for 65.8 percent of revenue. Much of this storage is done under multi-year contracts, whose length is sometimes driven by food manufacturing firms who need reliable access to inventory storage for use in just-in-time manufacturing operations. This storage function has become critical to offer buffering supplies, where manufacturers do not keep and hold excess inventory. Similarly, manufacturers who run their own sales offices —particularly within the protein segments—use flexible cold storage operations to preposition products within high demand markets to increase their ability to respond to quick changes in market fundamentals. Since they do not own the facilities, they can quickly amend their sales territories and sales programs.

Handling of goods differs from storage through an offering of value-added services that offer solutions for distribution issues. These include order picking, moving, and loading within the warehouse, as well as packaging and marking. These services are growing in importance to the industry and currently represent 26 percent of industry revenue with the expectation that they may soon represent more than one-third of corporate revenue.

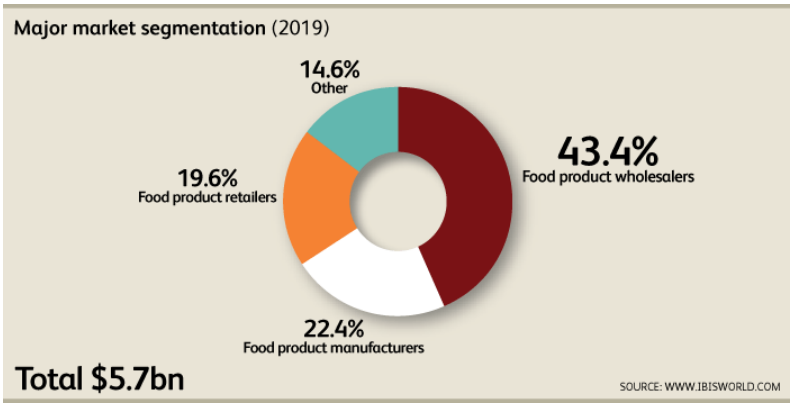
Operators are finding new ways to add value. For example, some provide transportation services with climate-controlled containers, generally over short distances. Some rely on outside service providers to support this function. As local transportation markets adjust, opportunities for specialized local carriers are arising. These specialized local carriers are often called trucker-jobbers. In their historic role, trucker-jobbers serve as mobile wholesalers, taking orders from local restaurants and retailers, purchasing on their behalf, and providing the last mile of delivery.

Other services that are rising in importance are logistics consulting technology services (software as a service: SaaS) and full supply chain management. These services seem particularly attractive to small and midsize manufacturers, wholesalers, distributors, and retailers to help customers meet downstream demand efficiently. More and more are offering some minimal processing, such as blast freezing, breaking larger lots into smaller packaging, portion sizing, meal kit assembly, and pick and pull order consolidation.

Demand for the services outlined above is driven primarily by domestic consumption of foods followed by food exports and domestic pharmaceutical and nutritional supplement manufacturing. Because of this, the industry has strong upstream and downstream linkages within the related supply chains. It is important to understand that, as these relationships that exist within a community, the greater level of economic benefits are retained, and the higher likelihood there is of success in operating a facility.

Primary customers for the cold storage industry in 2019 are food wholesalers, retailers, and manufacturers. Demand grows as per capita disposable income

increases, which allows customers to spend more on a variety of food products like frozen organic produce and ice cream.



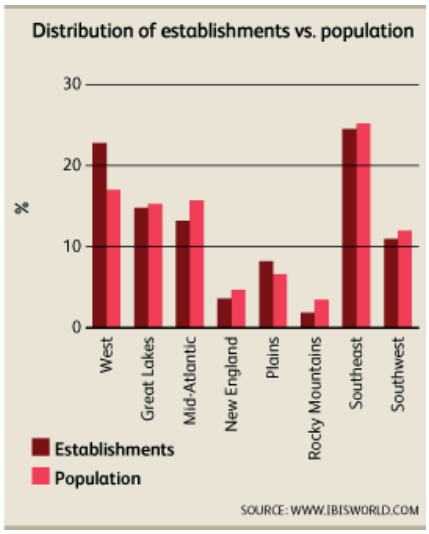
Food product wholesalers are the largest market for refrigerated services at 43 percent. However, an increasing number of major food and grocery retailers purchase directly from food manufacturers and managing their storage internally. So, despite increasing consumer spending, this segment's growth is constrained by such wholesale bypass. Increasingly, this leaves smaller retailers, wholesalers, and distributors as the primary client base.

Food manufacturers are the second-largest market and represent a variety of food types from dairy and meat to frozen packaged meals. The share of revenue from that segment has dropped from 34 percent to 22 since 2016 as the share represented by other segments has grown.

Food product retailers are also important users of cold storage. Revenue from this segment has improved slightly from last year. Retailer demand is for space that fits within their logistics system requirements and is often filling the need for urban storage or is transportation system centered. It is expected that as demand from this user group increases, it will be satisfied by building private storage that is fully integrated into the retailers' inventory management systems. This trend is already evident with the growth in cooperative storage options owned and operated by a consortium of retailers, often in collaboration with vendors.

Other industries demand freezer and cold storage for wide-ranging reasons. The largest segment is trade-related, and these facilities are often centered around ports of entry.

As one would expect, cold storage is regionally centered around population densities and agricultural and food production areas. With its large share of livestock and crop producers, the Great Lakes region is the third largest in number of operators in the country. The region has 14.8 percent of all establishments and 16.4 percent of all employees. However, most of those these operations are in places like Chicago and Sheboygan County, though expansion of cold storage capacity is expected along the interstate corridors. There are only five refrigerated warehousing and storage businesses in Dane County, and they are operating a full capacity.



Competitive Factors

The cold storage market has seen remarkable growth in the last two decades with modest slowing since the recession of 2008 began. Because of this, and changes in technology utilization, company growth has come through consolidation and acquisition. Concentration in the industry favors more capital-intensive firms with the economies of scale. With such scale, they can leverage the specialist network required to keep facilities running a peak efficiency, employ automation, and to support the value-added services, such as import/export management, 3PL (third party logistics) programing, and food safety program management that are in high demand by manufacturers and foodservice companies.

The two largest players in the industry are Americold Logistics, LLC with a 22.4 percent market share and Lineage Logistics Holdings, LLC with a 12.8 percent market share. Both are active in port-oriented marketing facilities as well as inland facilities tailored to domestic freight and logistics handling as well as packaging, repacking, and customs brokerage. Two additional companies each hold about 5 percent of the market, offer similar services, but are not active in the region. These firms are United States Cold Storage, a specialist in international trade, and Preferred Freezer Services, one of the earliest adopters of high-density storage with the logistics technology framework in the nation. Preferred Freezer is also part of a larger foodservice and food manufacturing conglomerate that operates many co-packing and co-manufacturing spaces across the United States.

Despite the trend in consolidation, most firms in the industry are small on both an employment and cubic foot basis. Almost 82 percent of all US facilities are less than 5 million cubic feet or 125,000 square feet. At the typical cold storage utilization rate of 28 percent, that equates to 6,500 to 7,500 pallet positions per facility. However, the trend in new construction is toward much larger facilities of 5,000,000 cubic feet or larger, and most of these are for public, versus private, use.

The following table highlights the cold storage availability within selected markets in the study region. It is clear from the table that Wisconsin is a large player in both the nation and regional marketplace with the fifth largest inventory of cold and freezer space in the US. The large number of meat and dairy manufacturing operations contribute heavily to this condition.

Cold Storage Availability by Study Area (1,000 cubic feet)			
	Wisconsin	Illinois	Iowa
Number of Facilities	95	29	25
Gross Refrigerated Space	103,068	22,866	11,551
Usable Refrigerated Space	74,815	19,576	8,945
Gross Freezer Space	125,044	165,135	38,752
Usable Freezer Space	105,059	132,334	28,607
Estimated Vacancy	5%*		
*Sources: USDA – National Agricultural Statistics Service, Cold Storage Survey, *Industry Interviews*			

Key Success Factors

The industry runs on a relatively simple product flow model. The costs associated with 100 percent fulfillment of this model are therefore straightforward and examine key success factors straightforward.

1. Utilization rates – Rent and utilities make up almost 14 percent of the operating costs of cold storage warehouses compared to 5 percent to comparative industries like refrigerated logistics, farm products storage, public warehousing, and other foodservice distribution. Therefore, designing facilities and operations to maximize storage utilization rates and reduce energy usage is critical to success. This is a key contributing factor to the high failure rate of wide-aisle, low-height common cold storage facilities.

2. Automation – Personnel is the largest operating cost in this industry. This is attributable to several factors, not the least of which is the unfavorable working conditions that require long break times and lead to higher error rates than in other "pick and pull" operations. Utilizing more automation leads to lower labor costs per pallet position, reduced errors, increased operating rates (due to lower lighting requirements and less heat transfer, and higher density racking.) All of this means more pallets per cubic foot and a lower operating cost per pallet position. Technological advancements are also driving more automation. Tracking inventory with RFID and other wireless technologies enable automated storage and retrieval with users having real-time supply chain visibility as well as better control over inventory management practices.

3. Energy efficiency – Utility expenses are significant in this industry, and any effort to improve efficiency goes straight to the bottom line. Recent studies in

the US and Europe indicate that new refrigeration technology and automation adoption can reduce energy use by 25 percent to 35 percent, which translates to a profit enhancement of 31 percent.

4. Contracts – Solid facility utilization is required to get payback on automation and energy efficiency investments. As a result, the industry is increasingly looking to its customers to commit to five-year contracts to lock in minimum storage levels. Contracts often represent at least a portion of the expected efficiency gains but have the effect of locking small users out of the market.

5. Provision of facilities and services - Until recently, most cold storage warehouses were little more than "pick and pull" facilities. Customers would drop off products and pay separate charges for stocking, monthly storage, and removal of products. To make better use of personnel, companies began to offer value-added services to support the customer base. These included having specialized facilities for packaging, sorting, order assembly, freezing, chilling, thawing, logistics, trailer rental, freight brokerage, export/import processing, freight processing, and even truck services. Food safety programming or the ability to support various food safety programs such as GlobalGAP, BRC, SQF, and others is imperative, as is blockchain and distributed ledger capability. These services are offered a la carte and represent a significant advantage in attracting contractual clients as well as maintaining profit margins.

6. Direct access to transportation hubs – the refrigerated warehouse industry is supply chain driven. It must fit economically within the supply chain of either its supply or demand industries. Facilities with direct access to key transportation infrastructure, such as Interstate highways, rail, and ports, will generally have an advantage over those that are not in major transportation corridors. There are exceptions to this rule, such as locating the facility next to a large user, but these are rare.

Collectively, this section tells us that success in a new facility depends on efficient design of building and operations combined with modern services and amenities sufficient to attract contract users. Overdesign and building excess capacity without a clear buyer for space will greatly challenge feasibility.

Demand Analysis

Local Opportunity

The study region is home to many food manufacturers, retailers, and growers that are seeking refrigerated warehouse space. The market has responded by adding facilities, most of which are privately owned and operated. Out of the 57 facilities in

the region, only five operate in Dane County, and these are at full capacity. This situation made common cold storage shortage a frequent interview topic.

According to one user, "We have a hard time getting regular deliveries into Madison because of the DOT rules. So, we need to order larger volumes which are difficult to store because we have no warehouse. If there is a mistake in an order, we are sometimes without a product for several days. Finding a warehouse solution is important, but we can't afford one on our own." Furthermore, local retailers and manufacturers are looking for additional services such as local delivery and processing space for adding value. The market for freezer and cold storage space is relatively straight forward and demand simple to model, but adding the additional parameters will require more complicated planning.

Table 1 Demand by segment per interviews

Supply Chain Segment	Storage Type	Storage Term	Estimated Pallets Required	Number of Expected Users
Farmers	Seasonal cold, freezer, and humidity controlled	Short to medium	200	10-20
Food Manufacturing	Raw material, intermediate products, and finished goods	Short to long	300	3-5
Distributors and wholesalers	General operations plus temporary storage, load assembly and consolidation	Short to long	250	1-2
Retailers	Off-site inventory management	Short to medium	200	3-5
Transportation providers	Cross-docking and on-going operations	Short to long	220	2-4
Other	Short-term and seasonal	Short to long	100	5-10

Small Lot-Size Storage

With few exceptions, per-user demand for storage space in the region is small, under 40 pallets, and is driven by seasonal and market cycles. Such low numbers mean that traditional cold storage providers are unlikely to accept these users. The impact on small businesses is real, with more than one retailer citing the impact on stocking decisions and price points. "Our price points are often higher than national and regional stores because we have no place to store large volume purchases. So, we miss out on deals" – small retail owner.

The number of users yields a total demand of more than 1,270 pallet spaces. For example, small retailers—many in minority and disadvantaged neighborhoods—

have insufficient onsite storage and would like access to local cold storage that enables just-in-time delivery. Such an operation would improve their purchasing power and allow the stores to reduce prices.

Aside from the lack of access due to size, two main subjects arose as issues during interviews with retailers and manufacturers. These local businesses are looking for additional delivery and transportation options, as well as co-packing and manufacturing space. The latter needs are addressed in a separate memorandum.

Transportation

Transportation is presenting serious challenges to the food industry nationally and locally. Madison's geography and distance from metropolitan areas present additional unique issues. DOT rules make delivery from Chicago and Minneapolis difficult to turn around in a single day. Local traffic issues and city layout amplify that difficulty. As noted in the opening section of this memo, a number of regulatory changes are expected, now that the 14-hour rule has been suspended and its future is under review.

Even with the change in the 14-hour rule, logistics are still challenged by the same general conditions, including reduced delivery hours, fewer days of services, limited delivery options, and the occasional stranded truck. Wholesalers have attempted to compensate for this condition by putting more trucks on the road, increasing demand for drivers in an already short labor market. It also has increased the instance of less-than-truckload deliveries, which raises the financial burden on wholesalers and the use of minimum order levels for small accounts. Furthermore, many of the large logistics companies the project team interviewed are in a holding pattern in making further significant changes in capital structure until the DOT makes further interim and final rulings on ELB's and driver hours.

Interviews with users within Madison confirmed the project team's initial findings. One user said, "Distribution companies simply can't afford to risk having their trucks shut down on our docks because of driver limits, and we can't have trucks parked at the dock for half of a day."

A tight job market adds another layer of difficulty according to another interviewee. "Local and long-distance transportation are some of the greatest challenges facing our industry. Furthermore, DOT rules and a hot labor market make it difficult to find drivers."

Therefore, the idea of collaborating on storage with load consolidation and local delivery options is attractive to users both inside and outside of the market. Without participation from outside users, however, the market is likely to be small and focused on the limited shared real estate needs of users that do not have the financial wherewithal to build out private facilities.

Commonly requested services:

User requirements for this alternative development model differ significantly from the high-density model presented in the August 26th memorandum. Furthermore, the requirements as presented favor a second-party logistics (2PL) model whereby a common operator with an interest in the industry performs operational services. The following table highlights user requirements.

Facility & Service Requirements	Intermediate	Small
Year-round contracted demand	X	X
Short-term, seasonal, & overflow demand	X	X
Dedicated/private docks	X	
Dedicated/private packing and loading	X	
Sorting	X	X
Palletizing/depalletizing	X	X
Pick and pull operations	X	
Repacking	X	X
Consumer pack/club pack	X	
Industry Standard Food Safety Programs (GFSI)	X	X
Product traceability	X	X
FIFO inventory management system	X	X
Power redundancy	X	X
Proximity to Interstate	X	X
Local Distribution	X	X
Trucking services and logistics support	X	
Load consolidation	X	X
Cross Docking	X	
Load assembly	X	X

The prospective users, while recognizing the need for simple cold storage solutions at this time, did see the benefit to services beyond those listed above. Much of the identified need was driven by firms that service large wholesale and institutional accounts and were related to accommodating future trends in just-in-time fulfillment of internet orders, increased requirements for full supply-chain visibility using complete technology integration, shorter order cycles, and integration of front- and back-end technologies (Industry 4.0). With all these changes, the potential cost savings of shared facilities and services are viewed by many as a risk management strategy that is only available in a user-controlled, cold storage environment.

Unlike the high-density facility presented in the August 26th memo, this facility does not require Industry 4.0 capability to be considered a viable option. It does, however, require modern facilities that can be certified under current best practices for the commodities being handled as defined by the Food and Drug Administration (FDA), the United States Department of Agriculture (USDA), and the Global Food Safety Initiative (GFSI). To accomplish this, the proposed new facility should be professionally managed under contract with a second party operator and logistics manager that has experience with the required regulatory and industry certification

and inspection regimes. The facility must be able to compete near the long-term cost curve for the wholesale industry with the understanding that it is unlikely to achieve the efficiencies of 3PL providers on a pallet turn basis. As noted above, it must also support modern front-end to back-end traceability, where required.

The proposed facility design characteristics required to meet the above requirements are defined in the next section of this memo. These criteria are, for now, quite general, as the final user base and their operating requirements can have a significant influence on the cost of the ultimate design.

Site selection for the facility, however, is not complicated. Adaptive re-use of industrial and commercial warehouse facilities with 22-foot to 32-foot clear heights are acceptable. It is recommended that the site be situated within a traffic corridor that allows proximate access to major arterials and interstate highways. None of the above requirements rules out the former Oscar Mayer site for use as a cold storage facility.

Facilities & Services

The demand for ambient, cold, and freezer storage with attendant services presented in the previous table yields a picture of a very straight forward common cold storage facility.

Design Program

The understood demand translates to a minimum design capacity of 1,270 pallet positions to accommodate for normal pallet position vacancy due to operations with an expected utilization of 1,040 pallet positions. General warehouse allocation is 11 square feet per pallet for three high racking systems using a combination of push-back (2 x 3) and flow-through racking (4 x 3). There will be multiple temperature zones from -20 to 55 degrees Fahrenheit. With wide aisles averaging 14 feet, the warehousing portion of the facility will require approximately 14,300 square feet with a recommended clear height of 28 feet to accommodate the expected full pallet storage requirement and proper lighting for inspection.

Loading and unloading require sufficient interior transitional floor allocation and food segregation areas to keep regulated food separate. As well, the facility must be able to accommodate product flow-through that segregates outbound and inbound shipments. Based on the expected truck turnover, seven sealed doors will be sufficient to manage traffic with the expected load volume.

Inbound freight may require sorting and repackaging, with space allocated for this purpose at approximately 1,500 square feet. Staging, packing, repacking, and labeling activities may be required on the outbound side of operations for an additional allocation of 1,500 square feet, as a minimum.

The facility will also require office facilities, restrooms, and locker rooms. The total allocation for administrative and overhead uses, as well as plant and equipment rooms, is 2,000 square feet.

It is envisioned that the facility will not be fully automated, but instead will use limited automation through basic 2PL or 3PL warehouse ERP programs. Racks will be a combination of gravity feed and pushback to ensure proper FIFO inventory management. As a note, new facilities such as these can be efficiently designed to have fully automated warehouses with no personnel needed for warehouse operations. The use of such systems at a facility of this small scale is not economical.

Use	Area	Special Notes
Warehouse	14,300 square feet (sf)	Flex warehouse or high cube facility to accommodate three-high racking. Zoned to hold temperatures between -20 to +55 F
Dock and material handling	3,000 sf	Area maintained between 26 and 55 degrees. Minimum of seven dock doors and minimum 22-foot clear height
Administrative and common areas	2,000 sf	Offices, restrooms, locker rooms, common areas, and boiler plant.
Total	*19,300 sf*	

Products and Services

The proposed facility will operate primarily as a storage and handling facility for cold storage of perishable products and sub-zero food products. If it is run as a 2PL, basic service fees for in-out service and storage will be charged, as well as incidental fees for pallet wrapping, pallet replacement, sorting, documentation, and inventory reporting. Additional services will include order pulling, packing/repacking, local logistics, managing customer EDI interface, and load assembly. These services will be priced on a á la carte basis with scheduling fit to meet the operating requirements of the 2PL.

Base Financial Projections

The purpose of this section is to model the basic development and operating costs associated with the facilities and services presented above. Costs and revenue estimates are magnitude-of-cost only and are based on interviews with cold storage operators and refrigerated warehouse construction companies. Therefore, costs can be used for advisory purposes only.

Capital Costs

Any greenfield development will incude costs that are not imbedded in site acquisition, surveys, onsite and offsite improvements, design and engineering, construction, impact fees and permits, cost certification, project financing, furnishings, fixtures, and more. At this point, these costs will be estimated as if the site chosen is pad ready with all necessary utilities at curbside.

Development Budget – New Facilities

Cost Element	Cost	Percent of Total
Site Acquisition	$0	0%
Architecture, Engineering, and Process Design	$129,000	3%
Site Development	$130,630	3%
Facility and Fixtures	$3,570,500	82%
Automation and IT technology	$350,000	8%
Contingencies and Soft Costs	$174,170	4%
Total	$4,354,300	100%

At the projected full development cost of $4,354,300, the project can be completed at $225 per square foot, which exceeds the normal range of cost for most new high-density facilities ($175 to $210 per square foot). Each of the above line items is discussed in more detail in the following text. Based on the above capital costs, leasing and retrofitting an existing flex warehouse building will likely yield higher returns.

I. Site Acquisition

It is assumed that the site will be acquired at minimal cost if the project is to meet basic economic development criteria such as investment, job creation, tax base enhancement. As an alternative, the design program may be amended to fit an existing facility such as the Oscar Mayer site or new flex warehousing facilities.

II. Architecture and Engineering

The architecture, engineering, and design phase of the project could run through a wide range of options based on site characteristics, regulatory requirements, and process design criteria. Given that some level of fresh and frozen meat handling may be done, the facility will be a USDA-inspected facility and must meet USDA plant requirements, which will necessitate design and review by engineers experienced with the local USDA plan review processes.

III. Site development

For the purposes of this study, it is assumed that utilities are available at the site, and it will have limited development needs that include ingress and egress lanes, onsite utility improvements, drive lanes, landing gear pads, and parking areas. For purposes of this report, site development costs are allocated using a low cost factor of $130,630.

IV. Facility and Fixtures

Facilities and fixtures include the building, and full fit-out of the facility including high-density racking, automation, and physical plant are estimated at $187 per square foot and supported by interviews with Tippman Engineering. Each area of

the plant is allocated a separate per square foot cost to reflect the level of asset investment and finish required.

Other fixed assets, such as furnishings and enterprise software, are allocated at an additional $5.00 per square foot. Product processing and repacking areas require additional equipment, and material-handling equipment recharging areas will be required.

Use	Area (SF)	Cost/SF	Total
Warehouse	14,300	187	$2,674,000
Dock and freight handling	3,000	120	$360,000
Administrative and common areas	2,000	220	$440,000
Fixtures	19,300	5	$96,500
Facility Subtotal	19,300	185	$3,570,500
Enterprise Software			$350,000
Total	19,300	*203*	$3,920,500

V. Automation and Information Technology (IT)

The facility's uses will require that the operator have a simple ERP system that can support multiple business lines. Since the facility is envisioned as being operated by a 2PL, the operator should select the appropriate software to run the facility. Based on an interview with FISHBOWL, basic ERP integration is estimated at $350,000.

VI. Contingency

Contingencies may arise in construction or site preparation and are allocated at 4 percent of the facility and fixtures budget, or $174,170.

VI. Options and variations

There are many racking, automation, and equipment configurations that can change both the capital and operating costs of the facility. Chief among these is the level of automation selected for the facility and the pallet densities achieved in the racking systems.

Operating Costs

It is assumed that the facility will operate at the same level of efficiency as all modern, low-density facilities. On a magnitude of cost basis, operating costs are expected to be approximately $528,255 annually, based on an examination of the costs for comparable facilities and as presented below. Principal and interest payments may add as much as $374,347 in cash flow impacts, depending on the financing methods used.

I. Labor is the most significant cost associated with operating the facility. The staff mainly consists of warehouse laborers who will be responsible for all physical movement of products. Other than labor the staff will consist of clerical staff to

manage the inventory and billing systems, as well as a full-time facility manager and part-time engineer to manage mechanical systems.

Employee Class	#	Salary	Wage	Hours	Benefit Rate	Total
Facility Manager	1	$85,000			15%	$97,750
Plant Engineer	0.5	$76,000			15%	$43,700
Clerical	2	$42,000			15%	$96,600
Material Handler	5		$16	2,000	15%	$184,000
	13.5					$422,050

II. Purchases of supplies and services are estimated at $12,630 and include pallets, packaging, and professional services.

III. Energy, maintenance, and utility costs of the facility and are estimated at $32,722.

IV. Principal and interest payments on capital expenditures based on amortizing these over 20 years at 6 percent yields an average annual interest expense of $374,347.

V. Inspections and regulatory fees account for approximately $5,250.

VI. Additional expenses, such as depreciation and marketing, are expected to run approximately $55,602 annually.

Service Pricing

Services will be priced to recover costs and yield a normal operating profit. Based on the user profile, the facility is expected to yield monthly revenue of $46 per pallet position on 1,040 occupied units. This utilization rate yields annual sales of $526,400. Please note that these estimates are likely to undercount the revenue from services such as repacking, pick and pull, and load assembly.

Initial Financial Feasibility Statement

Based on expected revenue of $526,400 and operating cash costs (net of depreciation) of $493,810, the facility should yield an operating cash budget surplus of $32,590. If the facility is fully financed, the facility will not be able to support the expected principal and interest payments of $374,347. To cover the cash deficit, the pallet turnover ratio would need to increase fifty percent to fill the cashflow shortage.

Given the preliminary nature of planning for the project, these projections seem to support further analysis to include the development of a full design program based on detailed product flow and service requirement interviews, and confirmation of demand through letters of intent.

Site Selection

The proposed facility requires a site of 3 acres or larger to accommodate the building footprint and operating apron. Environmental conditions and the availability of public water and sewer will also affect the site requirements.

In terms of municipal services, it is preferred that the site be served by public water and sewer. Because the water and sewer needs for warehousing are generally for wash-down and sanitary needs of personnel, the facility should not put an excessive burden on the municipal system nor have significant well and septic impacts. Municipal and well-water will need to be tested and certified for food use.

Energy requirements for the facility for both primary power and backup power are significant. The site must be served by 1,200 KVA electric service as well as natural gas.

Oscar Mayer is a strong candidate site fot this activity.

Recommendation

Low-density warehousing facilities are difficult to cashflow and require careful review of the client base and its current and future storage requirements to establish the true operating break-even point.

TECHNICAL MEMORANDUM

DATE: **SEPTEMBER 4, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **QUASI-LAST MILE DELIVERY AND REFRIGERATED LOCKER SOLUTION FOR MADISON TERMINAL MARKET PROJECT**

This memorandum highlights and summarizes the data and findings of the ACDS, LLC study regarding grocery delivery, online ordering and quasi last-mile delivery as they relate to purposes and objectives of the Madison Terminal Market Project. This memorandum offers interim findings only and is intended to support a positive feasibility determination for the development of shared cold storage and related material handling and logistics services.

The memorandum is structured to introduce the critical data regarding the state of the industry both nationally and locally followed by an analysis of the specific local opportunity. It concludes with a brief financial analysis of the costs of locker purchases well as estimates of operating revenues and costs as required to satisfy the demand projections. This analysis is offered at the magnitude of cost level and is intended to help make a determination of "Go" or "No Go" on further research.

The Grocery Industry

The grocery industry is at a turning point. Many traditional grocery retailers are seeing declining sales and margins.[3] At the same time, there is an opportunity to capitalize on a confluence of trends involving consumer preferences and technology.

Even with industry growth during the last five years, it was slight (0.9% over the last five years).[4] The growth was also gained during a period of intense competition involving discount grocers (Aldi and Lidl), club warehouses (Costco and Sam's Club), alternative format groceries (Trader Joe's), and online grocers (Amazon Fresh and Fresh Direct). This competition is expected to intensify and force businesses to adapt.

[3] Kuijpers, Simmons, and Wamelen, "Reviving the Grocery Industry."
[4] Kalyani, "Shop Smart: Increasing Premium Brand Sales and Healthy Eating Trends Will Spur Growth."

Also, issues involving high real estate costs, declining productivity, and aggressive price-cutting are driving the grocery industry towards retail apocalypse and consolidation. The growth of discount retailers is putting downward pressure on other grocers to lower prices in an industry that faces thin margins. Grocers that cannot lower prices in existing stores have to shutter some locations. Since the supply of space devoted to food sales in the US exceed demand, closures can be significant without changes in business strategy.[5]

As a result, grocers need to consider consolidation, automation, e-commerce, and other ways to revive the retail experience. For instance, Kroger is experimenting with converting some of its supermarkets into small fulfillment centers powered by automation and artificial intelligence. These kinds of technology shifts are also spurring automated warehouses and the trend towards online grocery.

Online Grocery

Food retailers are increasingly selling products through online channels to complement a physical presence and meet the demands of consumers. Online grocery is a $33.4 billion industry and is expected to grow to $42.3 billion by 2024.[6] As more consumers, especially millennials and Gen Z, rely on Internet purchasing, it will be critical to find creative ways to get the product from the warehouse or store to the customer. Retailers' futures are likely to be dependent on developing last-mile or quasi last-mile delivery and pickup solutions that make the shopping experience seamless, convenient, reliable, and safe.

Many retailers have already teamed up with third-party operators, such as Instacart, to increase their customer base while offering a fast, convenient, and affordable delivery service. Others are experimenting with solutions such as Starship's robot delivery, Flirtey's drone delivery, Feast's bike delivery, and Penguin Locker's refrigerated locker systems.

Local retailers also recognize the need to stay relevant. One retailer noted that they "lose money on home delivery and online orders, but would lose customers if [they] did not have it" and "in order to keep our current customers, we have to offer online purchasing and home delivery, even though most will shop in the store."

Delivery Challenges

The general rise of online shopping and home delivery demand presents challenges related to trucking, delivery networks, and infrastructure. In particular, many metropolitan areas are concerned about congestion and public safety concerns with the increase in trucking activity. As a result, many cities limit truck drive times and routes to minimize traffic and potential for accidents. Such regulations can cause logistical inefficiencies for distributors.

Delivery issues impact the rest of the food chain as well. They can cause food safety challenges with the delivery of perishables for food distributors and grocery retailers. Consumers also have their concerns. A survey shows that the top concerns are "that

[5] Haddon and Jargon, "Supermarkets Face a Growing Problem."
[6] Hyland, "Fresh Start: Rising Consumer Income and Broadband Connections Will Expand the Industry."

produce chosen will be bad" (30%); extra fees (29%); "I will forget something" (22%); "groceries being stolen or lost" (7%); the store won't offer substitutions (6%); and the store won't accept coupons (6%).[7]

Besides freshness, delivery fees are a significant deciding factor for consumers. Twenty-six percent of the respondents were concerned about fees, 20% were influenced by convenience of the service, 12% cared about the user experience, and 12% valued the delivery speed.[8] While consumers demand convenience, they also desire affordability.

Similarly, retailers are concerned about delivery costs and the pressure to provide free or cheap home delivery. Delivery costs are the biggest hurdle to profitability.[9] Given this issue, it is not surprising that even Amazon, which helped spark the last-mile movement, uses a variety of measures such as membership fees, incentives, and pricing mechanisms to help reduce distribution costs.

Achieving a high "drop density" is important for lower distribution costs. When the number of home deliveries per hour is too low, it becomes costly. Two potential solutions include making a single delivery to a community or pooling deliveries. The latter would require collaboration between grocers and a third-party logistics provider, an example of which is Amazon, who offers customers free pick-up at its lockers and dedicated locations instead of home delivery.

Refrigerated Locker Systems as a Solution

Refrigerated lockers can serve as a good last-mile or quasi last-mile solution given the various traffic, delivery cost, and food safety concerns. Refrigerated lockers are multi-temperature locker units that store groceries for customers to pick up. It is temperature-controlled to ensure that perishables remain fresh and that products like meat, seafood, and dairy are maintained at proper temperatures. Customers pick up their orders by unlocking the locker through their smartphone's NFC capability, a QR code, a pin, or a swipe card. It is an Amazon locker that can store fresh food.

These systems allow one or more grocers to deliver and store orders at convenient locations. Lockers can be located at an apartment complex, a community center, or where people work. Their modular nature also allows for flexible arrangements based on demand by location. When strategically placed, they can also help save on distribution costs, which is especially beneficial for grocers serving metropolitan areas like Madison that have various traffic-related challenges. From a city's perspective, these locker systems provide a distribution model that can significantly reduce the number of trucks on the road.

Additionally, this solution fits well with consumer trends involving online ordering and home delivery. It is also an opportunity to support local food providers such as community-

[7] McGrath, "The Big Picture."
[8] McGrath.
[9] Kuijpers, Simmons, and Wamelen, "Reviving the Grocery Industry."

supported agriculture (CSAs) grocers, restaurants, and small distributors. In particular, shared use of a refrigerated locker network can help local and regional groceries stay competitive in a sector that is being dominated by a few large players (e.g. Amazon, Walmart).

Lastly, it helps solves one of the downfalls of fresh grocery delivery, which is that it is reliant on consumers to be home or remember to pick up the items and to store them promptly. When companies drop off items in an insulated bag or box, there are concerns over theft and the quality of the temperature-control. For deliveries that are accepted by the homeowner, timing is critical, and stores often get the backlash if products are not in good quality. A Madison retailer noted that customers "have to be ready to receive their perishable products in the window in which they were ordered, or risk missing their delivery. You would be surprised how many people forget." Here is where refrigerated lockers can help offload some of the delivery window constraints.

The Market Opportunity

Consumer Expectations

The modern food economy is being driven by expectations for on-demand services, seamlessness, convenience, and low-prices. Consumers are also increasingly relying on technology to meet their needs. At the same time, people are cooking less and expect to easily obtain home delivery, to-go options, and ready-made meals. Grocery retailers need to deliver on demands for ultra-convenience and modernized shopping experiences. Part of this means having store locations that are accessible, such as near train stations, residential areas, or work. Another aspect is being able to offer grab-and-go items and prepared foods. Lastly, it is also about being able to have various convenient delivery options.

Surveys indicate that a majority of shoppers are using convenience options offered by grocers. One survey that asked 3,342 primary grocery-shoppers, all of whom are smartphone users, showed that 52% of them use curbside pickup, in-store pickup, fresh delivery, or package delivery.[10] The top five stores that the respondents purchased online groceries from are: Walmart (82%), Amazon (35%), Target (29%), Kroger (23%), and Sam's Club (16%). Another survey showed that 42% of respondents have tried a meal or food delivery service.[11] 20% have used a grocery curbside or in-store pickup service; 15% have used delivery services like Uber Eats; 12% have used a meal delivery service such as HelloFresh; 10% have a grocery delivery service such as Peapod or FreshDirect; 8% have tried grocery pickup service like Amazon Locker; and 4% have some or all of their grocery delivered weekly.

Consumers will continue to shop at traditional grocers, but the format through which they do so is changing. According to another survey, 49% of consumers will continue to buy

[10] Field Agent, "Groceries 2.0 Vol. III."
[11] Regina Corso Consulting, "Phononic's 2019 Store of the Future Report."

groceries in traditional supermarkets and big-box stores.[12] However, online ordering will also continue to grow. Nineteen percent indicated they will shop more online and pickup orders at stores, and 17% will have their items delivered from traditional groceries. Consumers also expect delivery technology to evolve. Fifty-six percent expect groceries to be delivered through self-driving vehicles within five years. That said, many consumers are still hesitant about grocery delivery due to high delivery fees and food storage concerns.

Madison Consumers

Driven by Technology and Convenience

Madison has the right demographic conditions to take advantage of the trends towards online grocery and alternative pickup options. The majority of online grocery shoppers in the U.S. are single- or dual-income households who are tech-savvy, affluent, and time-crunched.[13] Of the 258,275 people in Madison, 71% of them live in 1 or 2 person households. About 54% of the city's population represents a younger, mobile, affluent, and well-educated demographic. They are also tech-savvy and digitally connected. Eighty-eight percent own a smartphone, and 82% own a computer making them most likely to be early adopters of a refrigerated locker system or variants.

These consumer segments also value convenience as an important factor when making purchases. Madison consumers are 9% more likely than the average American to buy items on credit rather than waiting, which shows that convenience and online shopping go hand in hand.

Local Food

Many Madison consumers also care about health, nutrition, and the environment. As such, they tend to buy and eat organic and natural foods. They are also likely to demand local foods and desire new ways to get these products.

Current options typically involve farmers markets, CSAs, farm box subscription services, or grocers that stock local food. In particular, farmers markets and CSAs are increasingly facing pressure from meal kits and grocery delivery. Even though many consumers want to support local, they also desire convenient pickup options. Given these conditions, it makes sense that local food purveyors should pool their product through a distribution partnership that allows convenience for customers while maintaining product freshness.

Dorm to Diplomas

About 12% of the city is categorized as part of the dorm to diplomas consumer segment. The University of Wisconsin in Madison brings an influx of college students who have little cooking experience, and prefer buying fast food, frozen meals, and take-out.

It can be easy to imagine refrigerated lockers being located on campus grounds or in student housing. While these consumers might not order online groceries frequently, they

[12] Regina Corso Consulting.
[13] Hyland, "Fresh Start: Rising Consumer Income and Broadband Connections Will Expand the Industry."

can benefit from a refrigerated locker system that also allows pickup of dry goods, snackable foods or produce, and ready-made meals.

Dorm to Diplomas	13,494 people
University of Wisconsin – Madison	43,820 students

Generational Demand

Millennials are the third-largest market segment for online grocery by generation.[14] Currently, these are consumers between 23 to 38 years old. About 18% of Madison's population is between 25 and 34 years old. These consumers are typically living in 1 or 2 person households and are tech-savvy, which makes them the ideal target customer for online grocery. Since they generally have lower incomes compared to older generations, they are often inclined to save on delivery fees. The desire to save creates an opportunity to use refrigerated locker pickups as a more affordable solution that offers convenience.

Generation X is the largest market segment for online grocery by generation. [15] Currently, these are consumers between 39 to 54 years old. About 23% of Madison's population is between 35 and 54 years old. These consumers also are in single or dual-income households who are tech-savvy and time-poor. Since they are typically further in their career and have young children, they are even more demanding of convenience due to time constraints. Placing refrigerated lockers at the workplace, near public transit, or even in a neighborhood makes sense to help save time on picking up groceries.

Baby Boomers are the second largest market segment for online grocery by generation.[16] Currently, these are consumers between 55 to 73 years old. About 18% of Madison's population is between 55 and 74 years old. Many of these individuals are in the final stages of their career or are retired. While they are not as tech-savvy and are reluctant to purchase food online, grocery delivery, and in-store pickup appeal to those who are not willing or able to carry loads of grocery.

Similarly, senior citizens over the age of 73, or those who are disabled often find it hard to get out of the house to buy groceries. Having refrigerated lockers at senior housing communities can help alleviate transportation and food access challenges.

Table 2. Madison Population by Age Group

Millennials (25-34)	Generation X (35-54)	Baby Boomers (54-74)	The Greatest Generation (75+)
45,715	59,145	46,232	13,172

SOURCE: ESRI BUSINESS ANALYST, 2019

[14] Hyland.
[15] Hyland.
[16] Hyland.

Local Food Retail

Refrigerated locker systems and similar technologies can enhance the possibilities and value for local grocery and food retailers. Given the competitive landscape and the projected growth of online grocery, there is a need to develop last-mile solutions. Earlier sections identify the logistics and cost-saving rationale behind the locker system.

The high upfront costs of deploying new technology suggest that small and medium enterprises should engage in partnerships with specialists and others in the industry to remain competitive against large companies that dominate the market (e.g., Walmart and Amazon). Collaborating and using a shared-resource solution allows for efficiency, less redundancy, and less retail cannibalization. Specifically, local groceries should pool online orders and get them distributed to refrigerated lockers that are shared and strategically located across Madison.

Table 3. Food and Beverage Retail in Madison

Industry	Firms	Employees
Grocery Stores		
Supermarkets and Other Grocery Stores	86	2,076
Convenience Stores	36	365
Specialty Food Stores		
Meat Markets	15	63
Fish and Seafood Markets	1	3
Fruit and Vegetable Markets	3	82
Baked Goods Stores	18	137
Confectionery and Nut Stores	10	45
All Other Specialty Food Stores	34	240
Beer, Wine, and Liquor Stores	37	161

SOURCE: D&B HOOVERS, 2019

Competitive Landscape

Concentration of Competition

The top four companies in the online grocery industry are Amazon, Walmart, Kroger, and Peapod. These account for less than 30% of the total industry revenue.[17] Although the barrier to entry into online grocery and grocery delivery is not high, companies like Amazon and Walmart have significant advantages. Their branding, supply chain networks, distribution networks, and scale make them tough competition. Their ability to drive down prices to crowd out the competition is also a threat to many local businesses.

Despite large players having logistical advantages, the entire sector deals with common issues related to delivery. Food perishability leads most companies to restrict delivery to certain regions, especially rural areas. So, most delivery businesses service metropolitan

[17] Hyland.

areas, so being able to capture a large market share in a dense urban population helps increase drop density and reduce delivery costs.

Delivery Strategies

Grocers and online grocers are competing fiercely for customers on multiple fronts. They are using branding, product diversity, promotions, and delivery or pickup options to gain market share. Ultimately, delivery costs will determine profitability for many operations.

Currently, there are several options for grocery delivery and pickup: in-store pickup, curbside pickup, and home delivery. The table below shows the key players involved in each type.

In-Store and Curbside Pickup	**Home Delivery**
Walmart Target Sam's Club Kroger/Harris Teeter Local Grocery Chains	Amazon Fresh Walmart Instacart FreshDirect Peapod

Amazon

AmazonFresh is Amazon's grocery delivery service. It currently operates in Boston, Baltimore, Dallas, Chicago, New York City, London, parts of California and New Jersey. In August 2019, it expanded into Houston, Minneapolis, and Phoenix. All of these locations are home to multiple Whole Foods stores.

Customers are offered attended delivery, doorstep delivery, and pickup. With attended delivery, customers choose a 1-hour time slot when they will be available to receive the order in-person. Doorstep delivery allows the customer to choose a 2-3-hour time slot that works best for the customer's schedule. Amazon then leaves the items at the doorstep in a temperature-controlled tote. Lastly, there is AmazonFresh pickup, which is only available in select cities and allows the customer to reserve a time slot and pickup at a physical location.

With attended or doorstep delivery, Prime shoppers can get deliveries for free if the order exceeds the local free shipping threshold before tax. Depending on the region, the threshold is either $35 or $50. Orders below the threshold incur a $9.99 fee. If it is a qualifying order, deliveries are free within two hours, while one-hour delivery comes with a $7.99 fee. Also, the service adds on $14.99 per month to the Prime membership cost of $119 per year.

Walmart

Walmart is racing ahead on grocery pickup and delivery. It currently offers free curbside pickup at 2,700 locations; that is almost half of its 5,600 stores. They also offer same-day grocery delivery at 1,100 locations and are rolling out a "Delivery Unlimited" subscription

in three cities. Additionally, it will launch its InHome Delivery service in three metro areas this in the fall of 2019, which will allow it to deliver groceries and even restock refrigerators.

Walmart accomplishes this through its personal shoppers and using the delivery networks of on-demand last-mile service providers. These on-demand services include Point Pickup, Skipcart, AxleHire, and Roadie, which use application programming interfaces (APIs) to match online orders with drivers.

The cost for same-day online grocery delivery varies by location and the time slot selected for delivery. It also requires a $30 order minimum but does not charge subscription fees. The average per-order fee is around $9.95 but can be less. Meanwhile, Delivery Unlimited allows customers to skip the per-order fee in favor of a monthly or annual subscription: $98 per year or $12.95 per month.

Partnerships are Key

Many grocery retailers recognize the trends and are feeling the pressure from major competitors like Amazon and Walmart. While retailers have the real estate and supply chain networks, they need specialized support to achieve profitable last-mile logistics. They work with delivery companies, 3PLs, partner with other food retailers, and explore new technologies (e.g. refrigerated locker systems, drones, robots, and self-driving vehicles). The process also involves finding partners who can provide automation, artificial intelligence, machine learning, and advanced data analytics to drive operating processes and business decisions.

Instacart

Many grocery chains work with Instacart as a way to get into the online grocery market without having to develop their own e-commerce platform. Examples of grocers include Wegmans, Aldi, Giant, Safeway, and Harris Teeter. In particular, Aldi has been rapidly working to develop pickup and fresh delivery options despite being known for its no-frills low-price strategy. It is clear that even discount grocery retailers, which are expected to grow in market share within the grocery sector, are realizing the importance of omnichannel retail and having various last-mile options.

Instacart works by featuring retail store products on its platform based on a customer's location. Customers sign up with Instacart and pay a $99 annual fee to get access to the delivery service. When orders are placed, Instacart has a team of shoppers to fulfill orders at the store. Complete orders are then set aside for in-store pickup or delivered to homes. Deliveries can be ready in an hour, or it can be scheduled for later in the week.

Target

Another strategy is using mergers and acquisitions. In 2017, Target acquired Shipt, which is a grocery delivery service. Target uses Shipt to offer same-day delivery and pick-up; it is a way to compete against Amazon's Prime delivery and Walmart's Online Grocery Delivery.

Customers who want to use Shipt have to pay a $99 annual subscription, or they can pay $9.99 per order. Target states that its customers are increasingly using this service, which has helped double its sales.[18] Specifically, orders using Shipt accounted for more than a third of Target's digital sales, a 20% increase from 2018.

Meal Delivery Services

Meal delivery services also occupy a similar space. These companies include DoorDash/Caviar, Uber Eats, Postmates, and Grubhub/Seamless. Although most do not deliver groceries, they have the software capabilities and driver networks to compete with existing grocery delivery services or on-demand delivery services. On the other hand, partnerships can be developed with these companies to share drivers and maximize delivery routes.

Trends in meal delivery also provide a glimpse into how last-mile delivery is evolving. Similar to truck driver challenges in the logistics sector, delivery services often have to deal with a variety of personnel, food safety, and public safety concerns. Many in the industry believe that logistics is heading towards autonomy and remote control. For instance, DoorDash piloted food deliveries with Starship's small semi-autonomous robots on college campuses and in cities. It recently also acquired Scotty Labs, startup making autonomous and remote-controlled vehicle technology.

It is predicted that restaurants and grocers will increase their dependence on convenience-driven technologies such as robots and self-driving vehicles. The robot delivery market could grow to $34 million by 2024, and it is estimated that 85% of last-mile deliveries will be completed using autonomous vehicles by 2025.[19] However, there are still challenges from consumers viewing robots as an eyesore to cities banning autonomous robots on the streets for safety reasons.

The Next Frontier

Up to now, click-and-collect services and home delivery have been the go-to options for picking up or delivering fresh products, dry goods, and non-food grocery items. Locker deliveries have been primarily used for non-grocery items.

Food safety and maintaining product freshness are two significant limiting factors for lack of deployment for grocery lockers. These are concerns for many consumers, and also poses operational challenges for the retailer and distributors involved. However, new technology is allowing companies to assuage consumer fears and hesitancy. For instance, Parcel Pending and Penguin Lockers are developing a variety of refrigerated locker system solutions.

Although refrigerated locker use has been nonexistent or experimental, Amazon and Walmart are positioned to take advantage of this opportunity. Amazon already has

[18] Perez, "Target's Same-Day Pickup and Delivery Services Growing at Double the Rate of 2018."
[19] Manning, "Silicon Valley Is Bullish about Food Delivery Robots, but Cities and Consumers Aren't 100% Sold…yet."

partnerships with major retailers and convenience stores (e.g., Kohls, Safeway, 7-Eleven, etc.), which allows it to place lockers at these locations. Meanwhile, Walmart is working with Cleveron to pilot automated robotic pickup kiosk units that allow customers to pick up groceries using a QR code. These work like refrigerated lockers and are designed to fit in a parking spot.

Climate-controlled lockers are likely the next frontier for fresh food delivery. Thus, locking down real estate, acquiring the technology, and developing the necessary partnerships will be critical for successful implementation.

The Technology

Refrigerated lockers are modular multi-temperature locker units that store groceries for customers to pick up. Each locker within the unit is temperature-controlled independently to ensure that perishables remain fresh and that products like meat, seafood, and dairy are maintained at proper temperatures. The systems require a power source and preferably access to backup power, crucial for ensuring food safety and product freshness.

Customers pick up their order by unlocking the locker using their smartphone's NFC capability, a QR code, a pin, or a swipe card. Generally, pins and QR codes are the go-to options. This information can be relayed through apps, notifications, email, and text messages. Also, an API is integrated with a grocer's e-commerce platform so that the customer can select the best locker location.

Orders are delivered to the correct locker through software that is integrated with a grocery's order system. This integration occurs through an electronic data interchange (EDI) or API connection. Once the order data is received, it is earmarked for the exact locker location. Then this information is sent to the distributing party.

Logistics will be an important component of this process. It can be done either through a 3PL or in-house through logistics software that has route management and truck dispatching. Another closely related piece to logistics is inventory management and stock control. The software should be designed to determine when there are open locker positions and align it with delivery times. Additionally, data analytics and GIS software will be important for analyzing drop density, purchase volume, product mix, and optimal locations.

How it Works

The locker system solution is a network of refrigerated lockers that allows food retailers to reach more customers without incurring high delivery costs.

Refrigerated Locker Network

Refrigerated lockers will be located around Madison. Ideal locations are where a large number of people work, live, and play. For instance, apartment complexes, community centers, or office buildings. Even locating near transit hubs is a good option.

An independent party owns and maintains the lockers and partners with property managers and city to gain access to the location. For most buildings, these lockers can be located near the mailroom, lobby, or the garage. Getting lockers at these locations will require working with property managers to determine details regarding ownership, management, maintenance, and access.

API Service

Retail grocers get access to the network through a software-as-a-service (SaaS) solution that automates the backend logistics required to get online grocery orders delivered to the right lockers at the right time in the most cost-effective manner. This software allows grocery retailers to connect their e-commerce platform to the logistics and refrigerator locker network through an API. The API allows customers to see which lockers are closest to their desired pickup location and lets them select delivery time slots.

Based on this information, the software optimizes the timing and routes of distribution. It also performs locker management by analyzing space capacity to determine which locations may not be open and actively works to get customers to retrieve orders through notifications. It will also have information on the status of lockers and maintenance data such as temperature and if anything needs repair. Predictive analytics will also be used to determine which locations need more lockers, and where new locations should be established.

Multi-Tenant E-Commerce App

For grocers that cannot manage their own e-commerce application, there is an option to use a multi-tenant e-commerce app. This service helps grocers with zero e-commerce capabilities to quickly launch an online store that is connected with the refrigerated locker network.

Pooling Orders and Shared Logistics (Delivery Service)

The key to making this system work is to pool orders and share logistics, which allows smaller scale grocers to reach more customers and share costs. In particular, it minimizes the number of trucks needed and reduces transit time.

There are three distribution options:

1. In-house distribution: the independent party owns both the refrigerated locker network and delivery vehicles.
2. Designated third-party: hiring a 3PL or partnering with a grocery delivery service.
3. On-demand services: hiring drivers through an on-demand last-mile service provider.

Fulfillment Solution

Orders can be fulfilled in-store or at a warehouse. There are several options for fulfilling orders:

1. The grocer picks and pulls their products at their store or warehouse.

2. The grocer develops a personal shopper team, by building from scratch or seeking out a service like Shipt or Instacart.
3. Grocers share a warehouse space that is preferably high-cube and automated, the most cost-effective option.

Pilot Program

The details described above are for a theoretical optimal solution. However, more information needs to be gathered from retailers, local distributors, and property managers to create a feasible model that works in Madison.

The project team proposes a pilot for refrigerated lockers to be located at seven locations across the city. The lockers would be placed at multi-family residential complexes, office buildings, and community centers. They should also be located in places where food access is a challenge. Local grocers and CSAs that already engage in-home delivery will be invited to participate in the pilot. They will get access codes for their couriers to deliver to the lockers. The pilot will charge the users on a pay-per-use basis. Every order that gets sent to a locker will incur a fee.

The other component that needs to be developed is the locker network API. This software interfaces with e-commerce platforms, manages the lockers, and performs analytics. The locker system would not work without these backend analytics. Besides the cost of the lockers, this represents the bulk of costs.

Budget

This pilot is likely to cost around $250,000. Buying and installing the lockers will cost about $48,300. The development of the application, API, and integrating with each retailer's e-commerce can cost $115,000. Ongoing operating costs include energy, maintenance, server hosting, and technical support adding $86,480.

Revenues will be made through a pay-as-you-go method. To break -even on operating costs, this program could charge around $9.50 per transaction, assuming that each locker can service up to 500 households in a year with a 5% online grocery utilization rate. This rate is based on a survey that showed 4% of Americans buy online groceries once a week. At the end of the year, that is 9,100 transactions.

However, the $9.50 charge is too high in an industry where grocery delivery services charge $9.99 per order at the most. This charge does not account for the fulfillment and delivery costs that grocers have to pay. Thus, this pilot is important for determining fee thresholds. In addition, the pilot will likely run on a loss until transaction volumes greatly increase.

Table 4. Baseline Budget

Capital Costs	
Refrigerated Lockers	$44,800
Installation Costs	$3,500
Integration with e-commerce	$5,000
Application & API Development	$110,000
Subtotal	**$163,300**
Operating Costs	
Energy Cost	$2,040
Maintenance Cost	$2,240
Cloud Server	$7,200
Tech Support	$75,000
Subtotal	**$86,480**
Total Cost	**$249,780**

Recommendation

The ACDS, LLC project team recommends moving forward with additional research on this topic to include additional focus groups and outreach with the retail, real estate, distributor community.

TECHNICAL MEMORANDUM

DATE: **AUGUST 26, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **BUSINESS SERVICE NEEDS AND SOLUTIONS FOR THE MADISON TERMINAL MARKET PROJECT**

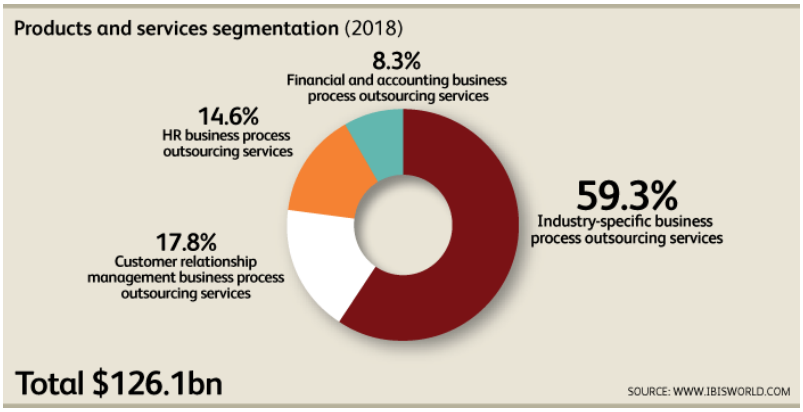
This memorandum highlights and summarizes the data and findings of the ACDS, LLC study related to the creation of value-added business services to support growth-oriented food businesses at all levels of the supply chain. Small businesses face ever increasing regulatory and industry requirements that effectively serve as barriers to market entry. These requirements place an extraordinary burden on small- and mid-sized firms that cannot afford to distribute the extra costs to their consumer base. In response, this memo offers possible solutions and interim findings that point to additional research needs for the support of such businesses.

The findings of this memorandum are highly correlated to the outcomes and recommendations found in other memoranda. As a result, it should be read as a compendium to other memoranda, especially those dealing with facility and technology development.

General Industry and Market Analysis

The Industry

At the national level, growing technical and regulatory requirements for businesses have led to a rapid expansion in the provision of certain third-party service providers to fill the knowledge, skill, and expertise gaps that arise. Business process outsourcing (BPO) services are filling the niche of providing support in for specific tasks, enabling small- and mid-size businesses to focus on their core



competencies. Working with BPOs helps companies adapt to changes so they can maintain profitable business relationships. Human resource management is a BPO common function that is easy to understand, but more common services are customer relationship management and industry-specific business services.

Nationwide, there are more than 145,000 BPOs with a revenue of $126.1 billion. The industry has fared well over the last five years as the economy has improved. Growth is projected to be slow, but steady at 1.0 percent annually for the next five years.[20]

The Market

Many small food entrepreneurs struggle with success in the marketplace. Specifically, it can be difficult to manage a scale-up or deal with the transitional forces in today's dynamic economy without accessing outside technical and professional expertise or bringing that expertise in house. Businesses often encounter problems with implementing technology solutions, employing a ready workforce, finding flexible real estate options, properly capitalizing growth, developing efficient procurement systems, implementing merchandising programs, and managing logistics. As a result, many companies fail to achieve their growth objectives.

There were many notable examples of how these complex requirements affect business outcomes. Below are a series of quotes from business owners within the region that highlight the complexity of these issues.

Category management and marketing support:

"Increasingly, it is our employees in the retail store stocking shelves and interacting with the customer for our small range of products. Other farmers and vendors are doing the same thing at the same time. We should be supporting one another" - Regional vegetable grower

"Almost all retailers are moving toward outside category management in their perishable departments to reduce overhead costs. Vendors with the capability to integrate these services and related technologies will have a sales advantage." – Regional wholesaler

Food safety and blockchain:

"We are losing institutional sales because our growers do not have harmonized GAP plans. For many of the small growers, these plans are cost-prohibitive." - Food hub manager

"Large retail accounts want encrypted, end-to-end transparency. Continued sales will depend on being able to offer it, but we don't currently have the systems in place to support such activities." – Regional vegetable grower

[20] IBISWorld Industry Report OD4794, October 2018, Marisa Lifschutz, Business Process Outsourcing Services in the US

Business operations and process skills:

"Beyond recipe development and business planning support, most food entrepreneurs are not equipped with the necessary skills in marketing, personnel management, finance, food science, and supply chain management to survive growth." – Regional copacker

"Identifying and hiring the right employees to position the company for growth is difficult in the early stages of growth. There are few resources to help with these types of personnel decisions." - Food entrepreneur

"Hiring technical experts to help with supply chain transparency and logistics is difficult when you don't even know the questions to ask." – Food entrepreneur

Quotes like these were common throughout the interview process. While there were many commonalities across sectors, needs varied widely by business but seemed to be summarized best by the company's stage of growth.

Startup and Expansion	**On-going Operations**
Product development	Personnel and Human Resources
Procurement system development	Merchandising and category management
Workforce development	Logistics management
Financing solutions	Technology implementation
Location assistance	Workforce training
Packaging solutions	Process efficiency
Manufacturing solutions	Capital deployment

For many interviewees, even identifying common business service needs was a challenge. The result could be that business process inefficiencies may continue until the resulting inefficiencies or market barriers become acute hurdles to business continuity. This situation makes developing the capacity to assist with the identification of business process needs nearly as important as creating the solutions.

The Competition

Competition in the field of business services comes from many types of vendors, depending on the needs being satisfied. Since the industry is made up of specialized firms, BPOs can participate on any number of levels so that other services providers could include accounting firms, law firms, human resource management companies, logistics services, technology consultants, business development offices, manufacturing extension programs, business incubators, and accelerators. Many of these services are well advertised but outside of the affordability range for most small operators, and in fact may be inappropriately scaled for many small operators

In the food supply chain, distribution businesses and grower-shippers have also started to supply additional services, such as category management and store level marketing initiatives. With knowledge of production calendars, available inventory and store needs, distributors have offered a more collaborative relationship with retailers by helping with promotional activities, merchandising, and seasonal product inventory management. When these services are provided, they increase the probability of a sale and will often lead to long-term, stable merchant/vendor relationships.

Supply chain visibility is a subject that covers many areas to include blockchain, logistics programming, and food safety. Many new technological advances are being used to accommodate these supply chain needs such as IBM's blockchain solutions known as FoodTrust.

Heightened food safety awareness, particularly in perishable products distribution, has rapidly increased the role of meeting third party certification requirements to sell food to any major wholesale or retail buyer. Thus, food safety is one of the new competitive features of the food trade, and Harmonized GAP (Good Agricultural Practices) is the entry-level. Beyond GAP, most buyers are looking for GFSI, SQF, and BRC certification for entry into the supply chain.

The Local Opportunity

Supporting the development of qualified business services for regional food and agriculture entrepreneurs seems essential to the success of the Madison Terminal Market Project. Adding industry knowledge and sophistication to existing support programs is a natural starting point. However, the project team believes that some services, such as category management, merchandising, and brand development will function best when cooperatively owned and operated by the businesses that will directly benefit. Both types are highlighted below.

1. *Work with existing providers to develop solutions for the business service needs of food companies in the region to support the use of local foods in local markets as well as the export of local food products.*
   Madison is already well-served by programs that support entrepreneurs and food businesses. Rather than recreating programs to serve members, these services should be coordinated with existing service providers, like the University of Wisconsin-Madison, Division of Extension, to refine existing support programs to meet the emerging needs of the supply chain. Farmers and food businesses, through a centralized representative (Coop), will work with program directors to support member businesses with appropriate programs like;

   - Food science services
   - Manufacturing support
   - Small batch processing

- Food safety training
- Food industry skills training
- Relocation/development assistance
- Start-up assistance

2. *Develop cooperatively owned services to augment sales and distribution of regional agriculture products while training the next generation of workers and entrepreneurs.*

Services related to internal and customer-facing operations will be provided to member companies to support their businesses in the use of the facilities and maintaining relationships with their customers. Logistics support will include personnel that move product within the warehouse facility, like order fulfillment and load consolidation. It will also include managing or operating local distribution services to customers within Madison. Other services will be customer-facing, such as providing member businesses with marketing services for in-store support and brand development to support business expansion.

- Logistics – Covered in
  - Load consolidation
  - Cross-docking
  - Order fulfillment
  - Local distribution
- Business services
  - Food safety programming
  - Supply chain visibility – blockchain/distributed ledger
  - Human resource management and training
- Marketing
  - Promotional activities
  - Merchandising services
  - Category management
- Brand development
  - Brand management
  - Media strategy
  - Audience segmentation

The Business Model

The business services model is envisioned as a companion to the facility and technology-based services and is not intended to be a stand-alone activity. The services envisioned will require significant collaboration and nuance to be implemented effectively. We expect that shared facility and technology applications will be necessary to build the relationships to employ a business service model.

With the above in mind, the ACDS project team envisions that once the true program needs are defined, the business services program will operate on a cost-recovery basis when

services are offered to members and at a premium to nonmembers with the intent to yield a 12 percent profit on nonmember services. This rate of return is consistent with BPO returns across the industry.

Examples of possible projects follow.

GroupGAP as a Food Safety Case Example

This year saw several institutional food buyers, and large retailers discontinue purchases from farmers who do not have harmonized GAP plans with the required annual audits. These plans and audits may cost farmers $10,000 or more annually in compliance costs. Furthermore, farmers with Harmonized GAP products cannot comingle crops with non-GAP products, reducing the ability to share distribution conveniently.

To make the mainstream retail market more accessible to small- and medium-sized growers, the USDA has developed a GroupGAP Food Safety Program. The program helps producers and grower groups, such as cooperatives and food hubs, comply with retailers' requirements for on-farm food safety certification. Under this program, any group of producers or supply chain partners who come together to implement a shared food safety program is considered a group. By working in a group, individuals can:

- Share resources and certification costs, saving about 60% over individual certification.
- Operate under a single, central quality management system.
- Demonstrate a recognized commitment to food safety.
- Develop a pool of diverse product offerings.
- Undergo audit together to obtain certification.

Certification under GroupGAP allows members to meet mainstream retail buyers' food safety requirements, thus opening doors to larger, more stable, and more profitable markets. USDA has programs that cover fruits, vegetables, and specialty crops.

These local programs will be developed with retailer support, by local farmers, and perhaps local auction markets, and will enable growers to implement their own Quality Management System (QMS), as required by the program. During the initial phase of the Cooperative development, grower recruitment and education will be key entry strategies. Once a group of participating growers has been established, the members will develop a QMS responsive to its customers' requirements, either developing it themselves or hiring a contractor to do so.

Once a group is established and has developed protocols, GroupGAP has two layers of audits. The first includes audits of all members conducted by the group's internal auditor. Internal auditors are chosen by the group and can be an employee, group leader, or contractor. He or she must have a high school diploma, have three years of post-high school education and/or work experience in an agricultural field, and must complete successfully a basic auditor training course, training on the selected food safety standard, and USDA-specific training on audit-specific acceptance criteria.

The second layer is the formal certification audit conducted by the USDA. This audit focuses on the whole group to determine if it has fully implemented its QMS, conducted internal audits, and taken corrective actions where necessary. Annual onsite formal audits are conducted on randomly selected members. The USDA will inspect a minimum of the square root of the number of members, so, if there are 164 members, a minimum of 13 will be inspected. If there are 100, a minimum of 10 will be inspected. Also, the group determines the extent of the certification, so the USDA will only inspect the commodities that are included in the internal audit.

As a shared business service, harmonized GroupGAP distributes the costs of both the QMS and audits across a large number of small operators. It can have the effect of reducing the individual cost of a QMS by more than $5,000 per farm while potentially reducing audit costs by several thousand dollars per year.

Trucking Services as a Logistics Case Example

Improving logistics system efficiencies was a near-universal need highlighted by interviewees. Expanding collaborative trucking options can include increasing the availability of trucker-jobber services, local delivery using a common carrier model, and load consolidation of less than truckload (LTL) shipments. Each of these cases is described below.

Trucker-jobber services are envisioned as a component of the cold-storage operations either as a cooperative trucking solution or as a subcontracted service. Following the traditional model of a trucker-jobber, this service would take phone orders from small restaurants, and retailers then fill those orders through cooperative purchasing from the cold storage facility and any number of regional markets and wholesale outlets. The intent is to cut down on the number of empty miles driven and relieve small retailers of the burden of driving personal vehicles several times per week to locations such as the Chicago International Produce Market. By aggregating just this last function, ACDS, LLC estimates that as many as 300 truck trips to Chicago may be eliminated in the first year of operations.

Common carrier delivery of local food deliveries using a cooperative local distribution company would allow farmers, manufacturers, and even institutions to drop off products destined for commercial and residential clients within the Madison study area. A common refrigerated carrier would then consolidate loads and make the last-mile delivery. This method would allow for more efficient local delivery and relieve truck traffic on Madison's already busy streets. It would also expand delivery options desired by local retailers and restaurants while limiting the risk of violating DOT time of service rules. While this service envisions co-development with cold storage facilities, it is possible to operate trucking services without physical facilities support, but the model would change dramatically.

Based on interviews, transportation costs are rapidly rising due to the high level of LTL delivery miles. Because of this, an electronic truck brokering response (See technology

memo) or a cross-docking facility (See cold storage memo) to consolidate loads passing through the region was regarded favorably by logistics providers. Either model would rely on a technology backbone to allow transportation companies to view and bid on load consolidation opportunities. Such a system could be bundled with the in-house trucking functions to reduce empty backhauls while improving load consolidation opportunities. One logistics provider interviewed indicated that such an operation would allow them to cut three trailer trips to the Chicago and Indianapolis markets per week. *Note: Because this function relies on local, regional, and national carriers to optimize performance, additional research is required to confirm volume and location criteria.*

Category Management and Merchandising as a Marketing Case Example

Regional wholesalers and farmers alike are being asked to shoulder the burden of category management and merchandising. Retailers are requiring that vendors manage bundles of like products as a single procurement activity. Vendors are taking an active role in floor planning, determining which items belong in the display and at what quantity, managing specials, creating seasonal promotions, and planning pricing specials. Large distributors and foodservice providers have been aggressively supporting these activities because they support long-term contract opportunities that allow them to lock out competitors from large bundles of products. The industry practice is often referred to as "divide and rule."

Local farmers and wholesalers understand that they must be able to compete with these category management contracts to survive in the market. To be successful in such an effort, local farmers, distributors, and wholesalers must collaborate on the development of a local program that can be managed for the benefit of the larger market. Hiring a category manager to create a locally-focused plan for sectors such as tree fruits, root crops, and organics may be highly beneficial to locking down retail shelf space. Issues such as off-season supply would need to be managed with retail clients and should not present a significant obstacle if transparency and traceability are built into the system.

To be effective, any category management program must offer merchandising support, including in-store stocking, customer relationship building, retailer training, and display building activities. These services are increasingly being supplied by someone other than store staff and are being used to create a competitive advantage. Local farmers, distributors, and wholesalers will only succeed in combating this trend in merchandising if they share resources to manage in-store stock, thereby reducing the overhead cost of managing in-store activities. This type of resource sharing is becoming more common in wholesale horticultural trade and has been supported with Specialty Crop Grant dollars.

Budget Note

Business services have their greatest benefit when offered in concert with infrastructure and technology solutions. Coordination will allow all levels of the supply chain to benefit from collaboration from farmers who can benefit from cooperatively managed

merchandising to retailers and restaurants that can access a great number of local products through the common logistics system.

Program design activities within the technology and facility segments of this study must be further developed before scoping can continue within the business services model. As a general note, these services will be offered on a cost-recovery basis.

Feasibility Recommendation

It is the opinion of the ACDS, LLC project team that certain business services are essential for local businesses to be competitive against large regional and national players, and they are worthy of continued investigation. As such, program design should proceed in lockstep with other recommendations.

TECHNICAL MEMORANDUM

DATE: **AUGUST 26, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **TECHNOLOGY NEEDS AND SOLUTIONS FOR THE MADISON TERMINAL MARKET PROJECT**

This memorandum highlights and summarizes the data and findings of the ACDS, LLC study related to the application of technology services as they relate to purposes and objectives of the Madison Terminal Market Project. It offers interim findings only and is intended to support a positive feasibility determination for the development of both business-to-consumer and business-to-business technology applications to support market growth.

The findings presented are highly correlated to the outcomes and recommendations found in other memoranda. As a result, the outcomes of those work elements may significantly impact the recommended outcomes for technology adoption.

This memorandum concludes with a brief financial analysis of the costs of technology development and deployment based on a hypothetical design program. These budgets include estimates for operating costs but do not estimate revenue potential at this time since it is assumed that some of these revenue functions will be embedded in other recommendations or are simply outside of our capability at this time. As a result, this memorandum only recommends piloting certain technologies where grant funding may be available to support such development.

General Industry and Market Analysis

Trends involving the Information of Things (IoT), artificial intelligence, big data, and augmented or virtual reality are driving technology adoption across all levels of the supply chain. The world today demands connectivity, data accessibility, and the ability to manage buyer and seller relationships across various digital platforms. Companies that do not find ways to efficiently manage their supply chain or to better engage their customers will likely fall behind the competition.

For farmers, this means using devices and applications to conduct business, manage production, or engage with customers. A survey from the USDA shows that 52% of farmers are using smartphones and tablets to conduct business, which represents an 8% increase

from 2017.[21] Usage can only be expected to increase as internet access, computer, and mobile device use continues to grow. Currently, about 75% of farms in the United States have access to the internet, and about 73% have access to a computer.

Processors, manufacturers, and wholesale distributors are also looking for software solutions that improve efficiency, provide enterprise resource planning (ERP), and offer business intelligence (BI) or predictive analytics. In the United States, the businesses that offer these services are part of a growing and emerging sector. Currently, it is a $69.3 billion industry. During the last five years, the sector had an annual growth rate of 9.3% and is projected to have an annual growth rate of 2.6% for the next five.[22] About 34% of the businesses offer customer relationship management (CRM) software, 30% provide ERP software, and about 17% provide BI software.

Integration of the above technologies across all business systems is what we now call Industry 4.0, and it yields significant gains to the bottom line. When ERP and BI systems communicate with automation systems, process controls, procurement, CRM, and others, Accenture estimates that bottom-line improvements are achieved by an average of $85,000 per employee.[23]

As internet traffic grows, food retailers are continuing to expand their e-commerce capabilities and finding ways to integrate their digital and retail experiences into a comprehensive omnichannel marketing strategy. Currently, e-commerce in the United States is a $546.1 billion industry that is rapidly growing.[24] During the last five years, the sector had an annual growth rate of 14.1%, and it is projected to have an annual growth rate of 10.0% for the next five. Currently, about 3.2% of the 230,000 e-commerce businesses deal with food and alcoholic beverages, about 7,360 companies. These include meal kit companies, wine subscription services, online grocers, and delivery-only restaurants.

Ultimately, all these technologies are about making businesses efficient, profitable, and accessible. While much of this has to do with supply chain and logistics, the ultimate driver is about meeting customer needs. Every interaction, from apps to brick-and-mortar stores, is about creating an experience that satisfies the customer while providing quality feedback that informs business decision. Finally, it is also about offering transparency and trust in a food system is complex.

The Need

Nearly every segment of the supply chain indicated that information gaps, communication challenges, and transaction inefficiencies present significant hurdles to increasing the level of business to business (B2B) and business to consumer (B2C) activity being conducted

[21] Market Intel, "Farmers' Growing Reliance on Technology Highlights Need for Robust Digital Toolbox."
[22] Cook, "Business Analytics & Enterprise Software Publishing in the US."
[23] Abood, "Unlocking the Power of Digital, Industry X.0."
[24] Spitzer, "E-Commerce & Online Auctions in the US."

within the study region. The information asymmetries caused by these issues were particularly acute for small and mid-sized businesses throughout the supply chain. Interviews within the supply indicated the following.

Supply Chain Segment	Need Summary
Farmers	Farmers are often unaware of the sales opportunities offered by large institutional buyers. Transportation is often inefficient and difficult to plan on a collaborative basis with other perishable distributors. Food safety standards including traceability standards, blockchain, and recall are difficult to implement and are not cost-effective for small farms. Transaction settlement systems are costly to manage and are often not linked to inventory management programs.
Logistics Providers & Distributors	Driver shortages, less-than-truck-load (LTL) shipments, and time-in-service restrictions make it difficult to offer reliable and profitable routes. Organizing local cross-docking opportunities is beyond the technical reach of most small and mid-sized operators as are the traceability and blockchain requirements of many firms. Recording the FSMA required truck sanitation operations are also problematic.
Wholesalers	Managing connections between many small farmers and retailers is a challenge. Wholesalers are limited by personnel, technology, and time, which makes it difficult to match supply and demand. Handling multiple, small vendor accounts with the required food safety audit trail and recall system information is not cost-effective, limiting local options. LTL and empty backhaul make logistics a cost center. Sales to large accounts require a high level of supply chain visibility with which small wholesalers may not be able to comply.
Manufacturers	Companies that process food face challenges in procuring local products. Food safety, price stability, supply chain transparency, logistics efficiency, and recall efficiency are among the top issues. Simplifying any of these functions may serve to open additional purchasing volume.
Institutions & Food Service Contractors	Institutional food service focuses on risk management and cost control as primary controls in their procurement systems.
Retailers	Retailers generally fall into two categories. The first group is the large regional and national chains that operate within fully integrated supply chains that require close coordination of store-level electronic data as well as full compliance with blockchain, logistics systems planning, and electronic billing. The second group is small retail operators that have little time to source from multiple vendors and are often required by minimum purchasing levels to provide their own logistics solutions. These users are often interested in local foods but find it difficult to do their own discovery.
Restaurants	These food system participants frequently purchase small, mixed lots of products that are inefficient to deliver and have a strong interest in call in and electronic ordering systems. They have little time to call more than a handful of potential suppliers, meaning it is difficult for them to source local products consistently.

Consumers	Consumers increasingly demand transparency in the food system and will expect the system to be able to deliver validated supply chain information such as source confirmation. Easier access to online shopping opportunities will also rise in importance.

Solutions

As the project team explored ways to engage technology to augment returns for local business operators, it became evident that the B2B needs expressed during interviews varied widely from the B2C technology needs. As a result, the ACDS segmented its technology research into B2C and B2B activities. The following sections highlight this work, beginning with using B2C technologies for increasing customer engagement.

Tools for Consumer Engagement (B2C)

Currently, the market mainly emphasizes convenience and large players such as Amazon and Walmart that have been aggressively competing in this space. For regional food economies to remain robust and competitive, there need to be alternative ways to engage consumers on local needs beyond responding simply to convenience. Solutions should make it easier for consumers to learn about where products are coming from and enable them to engage with the farmer or food business in creative ways. Tools such as mobile applications, blockchain, augmented reality, virtual reality, and community-driven branding are important for facilitating these interactions.

Tip Producers via Mobile App

The allure of local food is based on various values with varying preferences across consumer segments. These values include a desire for authenticity, more transparency, easier transactions, and a closer relationship with the producer or artisan. However, most of the products reach the consumer through a complex supply chain where it is difficult to discern the suppliers and verify producer claims, such as being organic or cage-free. Even regional-scale food retailers and food hubs struggle to convey this information beyond a website listing the farmers involved.

Nowhere is the difficulty more evident than in the farm-to-fork environment. Farmers complain that chef's make a single purchase to use their name on the menu. Similarly, chefs complain that it is difficult to order from farmers and that transaction terms often fall outside of the industry norm. Technology can be used to help smooth this challenging relationship.

In a supply chain where face-to-face interactions are not always feasible, mobile apps and interactive media can help bridge the disconnect. For instance, Accenture and Mastercard are piloting a blockchain-based app that allows consumers to use a QR code on a good's packaging to get information about its farm source and to leave a tip for the producer. This model can be expanded to allow tips for local food manufacturers and artisans. Additionally, these mobile apps should provide baseline information about the product, videos about the farm or business, and maybe even offer VR tours of the operations.

Adding Augmented Reality to Regional Branding

Product labels no longer must be static and full of text that most consumers might not read. Instead, labels and brand logos can be used to create consumer experiences via augmented reality. These labels can help consumers learn more about the product or company through the use of a mobile app. It can also allow the consumer to engage with the product through games and digital activities. Companies such as Pringles, Buffalo Wild Wings, and Pizza Hut have used augmented reality to grab consumer attention.

Various regional brands can use this technology to improve consumer engagement. For instance, the Something Special from Wisconsin brand can be further enhanced with a mobile app that allows consumers to interact with products that have the logo. The app becomes a gateway to learn about the product, farm, or business. It can even encourage consumers to provide feedback through comments, ratings, or votes, as well as teach basic culinary techniques.

Grocery Kiosks

Grocery kiosks take the middle ground between home delivery and a traditional grocery shopping experience. This technology streamlines a customer's experience at a grocery store. It helps by letting customers order deli meats and baked goods, without having to wait in long lines. It can also help customers find products and place other orders.

The future of kiosks can go further beyond by providing customers with a personalized experience based on their shopping history and preferences. For instance, it can remind customers of frequent purchases and allow for automatic re-orders. These kiosks may even help customers determine their grocery shopping list based on recipes, weekly meal plans, or even what is left in the refrigerator. Many of these functions should be synced with a mobile app to provide an omnichannel experience.

Technology also presents opportunities to address food access challenges. Grocery kiosks can be used in partnership with convenience stores or other locations where there is limited or no access to fresh foods. Customers can use the kiosk to select products from a variety of stores and get them delivered to that location or through a last-mile solution. The same technology could be used to enhance the farmers market experience for those with limited access if integrated with last-mile activities.

A potential supplier of these kiosks could be Frank Mayer, which is based in Grafton, Wisconsin. They manufacture a variety of kiosks including grocery self-service kiosks.

Facilitating an Efficient Supply Chain (B2B)

There are baseline tools that the terminal market needs to function efficiently. They include enterprise resource planning (ERP) software, route management, and ordering platforms that must be integrated within a modern distribution infrastructure (see cold storage memo). Beyond this, there is a need for tools that efficiently ensure food safety traceability, transparency, and access to information that will encourage more local spending.

Enterprise Resource Planning Software

The first tool a terminal market needs is a flexible ERP software that can handle warehouse inventory management, manufacturing processes, quality assurance, food safety, and purchasing. On the distribution side of the business, it is crucial to have lot, serial, and pallet tracking to allow for full traceability. Preferably, all of this data should be connected to a blockchain system through an API or EDI. Several ERP solutions to consider include JustFood, Syspro, and Fishbowl.

Route Management & Truck Dispatching

A food hub or terminal market will also need software to optimize routes and dispatch trucks. This service will be important for relieving farmers of complex logistics and distribution planning. It will also be used to coordinate distribution to retailers and institutions. In particular, this software will be useful for figuring out where and when to drop off grocery orders within the network of refrigerated lockers. Several software options include GetSwift, Onfleet, Routific, or BlueCart.

One-stop Online Ordering for Retailers

Retailers such as local groceries and restaurants often deal with multiple accounts and suppliers. Being able to buy from a variety of local or regional farms through one platform can reduce inefficiencies related to ordering. BlueCart is a platform that allows wholesalers to sell easily to a variety of retail buyers.

Online Marketplace

One of the pain points in the supply chain is the lack of information. Often, farmers are unaware of institutional demand and sales opportunities. Similarly, many institutional buyers find it difficult to determine quickly the quantity local farms can supply. The common complaint is that there is not a central place to find information.

The core of this problem is an asymmetric flow of information. Farmers typically plan their growing season during the winter months, whereas institutions have varied procurement schedules. For instance, school districts usually confirm their bids during the spring or summer. Whether it is the mismatch in timing or lack of clear communication, it becomes difficult to coordinate production planning to balance supply and demand. As a result, supplying and buying local becomes largely an ad-hoc activity, unlike the functionality of grower-shipper alliances that generally market on a prearranged contract basis.

Solving this problem requires a common platform where suppliers and buyers can easily share the necessary information that will lead to contracts. It can be as easy as an online bulletin where buyers share an RFI, RFP, or IFB to notify farmers. Alternatively, it can involve an online marketplace that matches growers to wholesalers or institutional buyers.

With the online marketplace, participating farms have a profile page that includes the products they grow, product descriptions, availability, and associated certifications. Farms can also provide information about their operation and ability to expand or grow new products. Simultaneously, buyers will share bid requests that include information on

products, specifications, and quantities they are looking to purchase. When the bid request is posted, a list of potential matches is made. Matched suppliers are notified, and the farms can decide whether or not they can contribute to fulfilling the request. Additionally, suppliers and buyers can contact each other via the platform to obtain more information.

Blockchain

Transparency and trust are highly valued in the supply chain and increasingly becoming a requirement of servicing large foodservice and retailer accounts. However, it is not always easy to verify information or even quickly resolve food safety concerns. Blockchain is a technology that uses a real-time decentralized digital ledger system to track transactions between multiple parties to improve transparency and trust between those involved.

Within the food supply chain, this means being able to track food items from the farm to the consumer's plate. The data tracked can be everything from product specifications, food safety certifications, transit time, temperature, and other pertinent information. This information is also shared across the supply chain so that everyone can view the same data.

The future of food safety and consumer engagement will likely rely on blockchain or a similar technology like Distributed Ledger Technology (DLT). When everyone participates in the blockchain, it makes it easy to quickly trace where food safety issues begin and where they might be headed. It also allows consumers to know where their food is coming from and provides a way to interact with the supply chain.

Using blockchain will require using existing systems such as the IBM Food Trust or creating one from scratch. Frameworks such as Trellis can also make it easier to work towards blockchain-type solutions. Either way, data from the ERP software will have to be integrated with the blockchain software through APIs.

The terminal market will also have to require its suppliers and distributors to scan RFIDs, NFCs, or QR codes through a mobile application to register information into the blockchain. This requirement is often the biggest hurdle to overcome since it is an added process and cost. Wireless data loggers, temperature readers, and location-sensing can help minimize the need for scanning but can also be costly to maintain.

Recommendation for Pilot Programs

The technology component of the terminal market will require ERP and logistics software as a baseline, which will cost around $320,000. Also, there are a few concepts that can be piloted to augment the terminal market activities.

The first is the online marketplace, which will act as an online bulletin for notifying farmers about regional contracts as well as a platform to match buyers with sellers. While this website is not highly technical, it does require a well-designed user-interface with a clean database design to allow information to flow seamlessly, quickly, and intuitively. Ideally, this platform will be integrated with the ERP system through API's to facilitate system

efficiencies. Creating a custom website that has user profiles, a scalable backend database, notification capabilities, and possibly messaging will cost around $75,000.

The second pilot will be the beginning of a blockchain system that is connected to a consumer-facing mobile app. Initially, this will be a private blockchain with permissions-based access relying on either proof-of-work or proof-of-authority, which is meant to encourage more participation from farmers and retailers. This process will require working with these key players to develop new processes and provide access to data. This exploratory exercise will likely cost $150,000. Building the blockchain application, database, and mobile applications will cost an additional to $500,000.

Budgets

Terminal Market Software

Item	Cost	Assumptions
JustFood ERP	$300,000	One-time set up; includes tools for quality assurance, food safety, warehouse and inventory control, manufacturing, sales, purchasing, and analytics.
JustFood Cloud Subscription	$10,200	$170 per month / named user; assume 5 users
Routific	$5,880	$49 per month / vehicle paid yearly; assume initial start of 10 vehicles; used for route optimization and truck dispatching
Total	$316,080	

Online Marketplace

Item	Cost	Assumptions
Domain	$100	$100 per year
Hosting (shared)	$60	$5 per month or $60 per year
Wireframe Development	$2,250	Hire consultant to develop and refine wireframe
Setup	$150	Hire professional to connect domain, host, and software
Design & Building	$58,000	Hire web developer with rate at $150 per hour
Content Creation	$1,800	Hire consultant to help with gathering content
Testing and Training	$3,000	Hire developer to beta-test, provide training, and make modifications
Launch and Digital Marketing setup	$800	One-time expense to develop marketing material and conduct outreach
Ongoing Maintenance	$8,000	A 10% time allocation for in-house IT staff to manage website and database. Assumes average IT salary of $80,000 (~$40/hour) with a 2000-hour work year.
Total	$74,160	

Blockchain and Mobile App

Item	Cost	Assumptions
Exploratory Phase	$150,000	Hiring consultants to gain commitment from key players in the supply chain to participate. Work with technical consultant to develop the data sharing protocols and framework for the blockchain.
Onboarding Costs	$115,150	Assumes the creation of 10 full nodes which can involve up to 250 end users.
Cloud Costs	$50,000	Cloud-based hosting capable of handling large transaction volumes (250,000 per day). Assumes $2,000 per virtual machine (VM), and 1 VM per full node. There are also storage capacity and transaction storage costs based on transaction volume.
Ongoing Maintenance Costs	$142,280	1 full-time employee dedicated to blockchain technical support.
Monitoring Costs	$15,185	Assumes about $15 per 100,000 for quality review costs and $1,495 in annual network assessment costs. This reflects the use of proof of authority as a consensus method.
Tracking App Development	$85,000	This is used for internal tracking. The app is used to scan products as they leave the farm, enter the terminal market, move onto trucks, and are dropped off. It will cost about $85,000 to develop.
Web/Mobile App Development	$85,000	Consumers will scan the QR codes on product packaging to learn more about the product, the suppliers involved, and provide ways to interact. It will cost about $85,000 to develop.
Total	$642,615	

TECHNICAL MEMORANDUM

DATE: **AUGUST 28, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **FLEX FOOD MANUFACTURING NEEDS AND SOLUTIONS FOR THE MADISON TERMINAL MARKET PROJECT**

This memorandum highlights and summarizes the data and findings of the ACDS, LLC study related to commissary and processing services, as they relate to purposes and objectives of the Madison Terminal Market Project. This memorandum offers interim findings only and is intended to support a positive feasibility determination for the development of shared commissary and processing logistics services.

The memorandum discusses the opportunity in four sectors. These sectors were chosen because interviews indicated that they are the areas that need the most service. It concludes with a brief financial analysis of the costs of new construction as well as estimates of operating revenues and expenses as required to satisfy the demand projections. This analysis is offered at the magnitude of cost level and is intended to help make a determination of "Go" or "No Go" on further research.

General Industry and Market Analysis

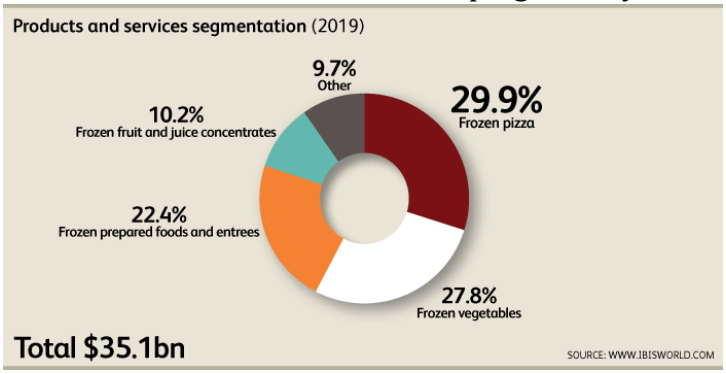
The Industry

Customers are expecting more than ever from their food. They want it to be easy to prepare, diet-approved, tasty, and highly nutritious. These market demands are driving food companies to develop new, easy to consume products, supplements, and spices to satisfy a continually evolving market. Sectors in this industry include frozen food production, bakeries, seasoning and condiment production, and nutritional supplement manufacturing.

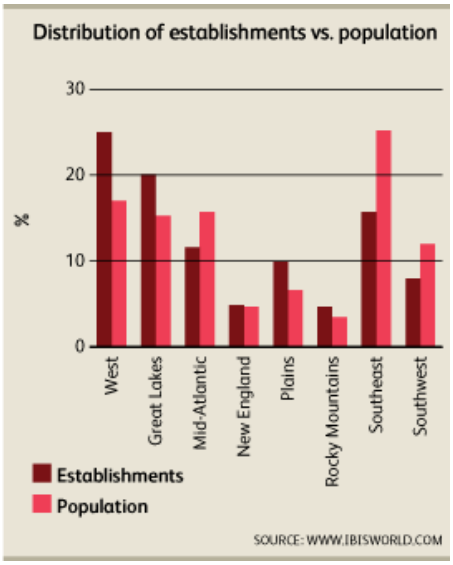
Consumers in the study area match these national trends and, in some cases, lead with higher demand for convenience options. With the state's rich history in food manufacturing, it has also been quick to adapt at both the product R&D and manufacturing levels. Based on interview results, the sectors with the highest demand for manufacturing development are highlighted below.

Frozen Food

Frozen food production is a mature, stable industry with about $35 billion in revenue for 2019 and projected growth of 0.9 percent annually over the next five years. The sector is struggling to overcome consumer conceptions that frozen food is less healthy, causing a shift towards more fresh food purchases. It is also under pressure from increasing fast-casual restaurants that are developing healthy menus and diet-specific entrees.[25]



Product segmentation is mainly divided between frozen vegetables, prepared foods and entrees, pizza, and fruits and juices. Pizza, despite growing health consciousness in consumers, is still the largest segment. Frozen vegetables enable the extension of shelf life, and those that have been frozen using IQF have higher nutritional quality than fresh vegetables. However, the segment continues to decline as consumers prefer fresh over frozen. Frozen entrees are also falling out of favor as consumers shy away from sodium and preservatives. Producers are responding by introducing healthier and less processed options to improve consumers perceptions. While entrees have diminished in desirability, frozen snacks have increased in popularity with families with children and young students and professionals who like the convenience. The consumption of frozen fruit has grown over the last five years, driven by changes in consumer preferences and new product development.



The Great Lakes region is estimated to house 20.1% of all frozen food manufacturing facilities. Illinois and Wisconsin dominate the region, accounting for 5.2% of total industry establishments each. Michigan (4.2%) and Ohio (3.3%) also account for a significant portion of regional establishments, due to the presence of favorable fruit and vegetable growing conditions. The region is also conveniently located within logistical distance to the Plains region (10.0% of establishments), which is a significant producer of critical inputs, such as flour and processed meats.

Frozen food manufacturers can be successful, even in a skeptical market, but there are key factors that enable high performance:

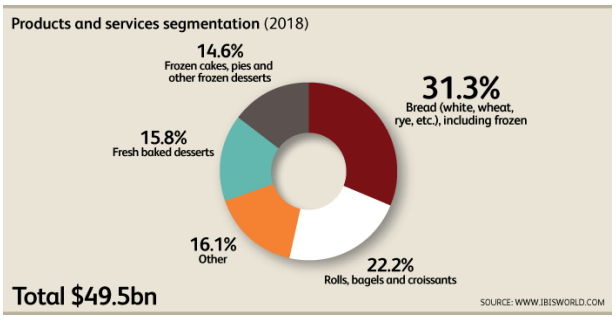
- Successful operators differentiate their products and brands

[25] Amir, Anna, "IBISWorld Industry Report 31141 Frozen Food Production in the US, July 2019"

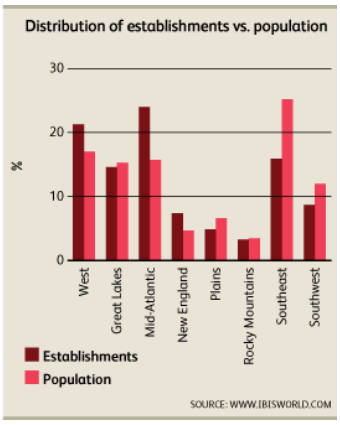
- Manufacturers must be able to adapt to changes in consumer preferences
- Supply chains must be reliable with fixed prices and guaranteed supply
- Production volumes that enable good economies of scale
- Ability to pass on unexpected cost increases to downstream markets
- Effective quality control ensuring that products are safe to consume

Bread and Baked Goods Production

Bakery production is a significant, mature industry in the US that grew well over the last five years, at 3.1 percent per year. However, it is facing a slowdown as per capita wheat consumption is falling. Growth over the next five years is expected to be 1.2 percent annually. In 2019, revenue is expected to be $49.5 billion.[26]



The sector is divided into several different baked good types. Bread, which includes white, wheat, and rye, is the most significant percentage product type at 31.3 percent. Rolls, bagels, and croissants are the next largest at 22.2 percent. Within breads, specialty breads are the fastest growing. Health-conscious Americans are demanding more whole grains, gluten-free, and allergen-free options, and less sodium, trans fats, and high fructose corn syrup. Artisan bread, made by hand using simple, all-natural ingredients, is an example of a specialty variety that is steadily increasing its market share. Historically, it has only been available local bakeries, but with improvements to automated machinery, large bakeries can produce artisan like loaves in bulk, enabling increased market penetration to mainstream consumers. In the bread segment, demand for standard loaves is expected to decrease, while specialty breads continue to grow. Change in demand for other baked goods has mirrored the situation with bread. Customers are eating fewer high calorie, sugar, and fat products like Danishes and purchasing more items like whole-grain muffins and gluten-free alternatives.



Bakery establishments balance their locations between sources of critical inputs such as wheat, flour, grains, and sugar and distribution centers and downstream markets. Most baked good production businesses are in the Mid-Atlantic and California. The Great Lakes region has 14.6 percent of the production facilities, though they are more likely to be in Illinois, Ohio, and Michigan than Wisconsin.

[26] IBISWorld Industry Report 31181 Bread Production in the US, December 2018, John Madigan

Consumer choices are putting pressure on baked goods businesses, but several factors encourage success:

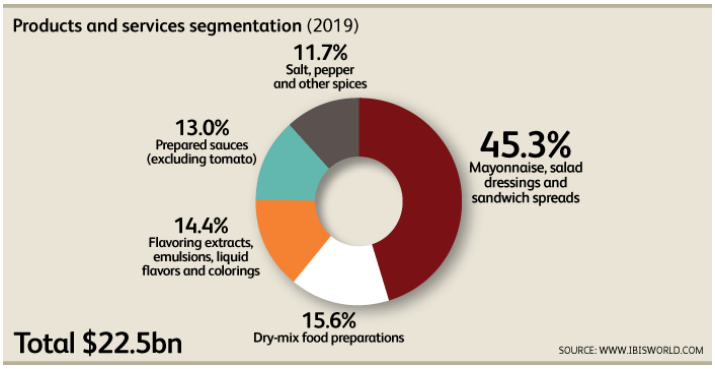
- Ability to pass on cost increases without significantly lowering product demand if input costs increase
- Supply contracts for key inputs with fixed prices help minimize supply costs and volatility
- Proximity to key markets due to the perishability of the product
- Use of efficient work practices helps offset the high cost of labor
- Product differentiation that includes brand recognition, value, and quality
- Establishment of brand names is vital for businesses that want to expand to new channels
- Ability to integrate health and nutrition options such as gluten-free

Seasoning, Sauce and Condiment Production

The Seasoning, Sauce and Condiment Production industry produces goods such as mayonnaise, salad dressings, spices, extracts, and dry food mixes. The wide array of products means that some segments perform better than others. Hot sauces and ethnic spices are growing more quickly than traditional salad dressing, mayonnaise, and other sandwich spreads. Revenue for 2019 is projected to be about $22.5 billion, and the annual growth rate over the next five years is expected to be about 1.4%.[27]

Products in this sector are varied and include:

- Mayonnaise, salad dressings and sandwich spreads.
- Dry-mix food preparations.
- Flavoring extracts, emulsions, liquid flavors, and colorings.
- Prepared sauces (excluding tomato).
- Salt, pepper, and other spices.

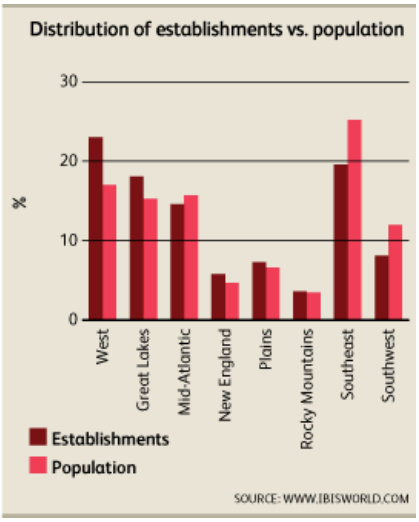


Mayonnaise and salad dressing are the largest segment at 45.3 percent. This segment grew over the last five years as more people cooked at home and made sandwiches to take for lunch instead of purchasing fast food. Another growth factor is the fact that salads are becoming more popular in both casual and upscale restaurants. Reduced-fat dressings and olive oil mayonnaise are appealing to consumers avoiding high-fat dressings. Dry-mix food preparations, like gravy and sauce mixes, are becoming less popular as people cook more from scratch to avoid sodium. The flavoring segment is mostly marketed towards restaurants and foodservice businesses. This segment is growing as customers continue to dine out. Prepared sauces include barbecue sauce, marinades, and hot sauce. Hot sauces have grown tremendously over the last five years and have a particular market among

[27] IBISWorld Industry Report 31194 Seasoning, Sauce and Condiment Production in the US, February 2019, Anna Amir

millennials. Salt, pepper, and other spices are decreasing as a share of the total sector, mainly due to the reduced use of salt. However, spice sales are expected to continue to rise as restaurants, and consumers cook more ethnic dishes and demand new flavors.

The Great Lakes is estimated to account for 18.1% of the industry's manufacturing facilities. Illinois and Wisconsin dominate the region, each accounting for an estimated 6.9% and 5.0% of total industry establishments, respectively. Michigan and Ohio also account for a significant portion of regional establishments, due to the presence of big cities such as Detroit and Cleveland, in addition to the area's favorable growing conditions. This region is also conveniently located within logistical distance to the Plains (houses 7.3% of industry establishments), which is a significant producer of key inputs, thereby lowering transport and distribution costs, contributing to lower production costs.

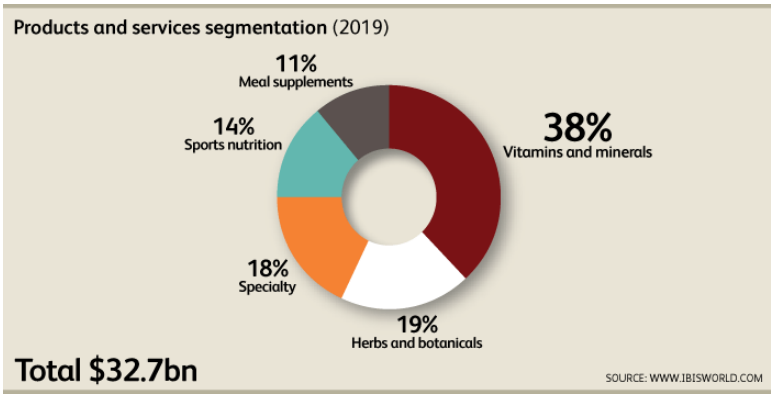


Key factors that enable success in this sector are:

- Supply contracts for key inputs
- Control of distribution arrangements
- Economies of scale and scope
- Product innovation
- Ability to pass on cost increases.

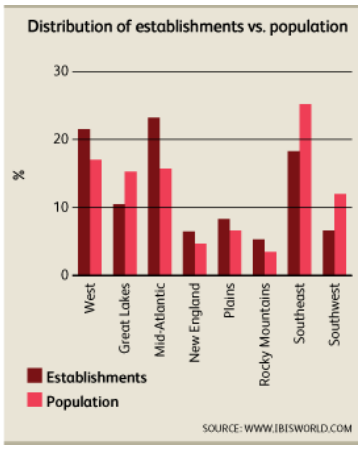
Vitamin and Supplement Manufacturing

The nutritional supplement manufacturing sector makes vitamins, sports nutrition products, and herbal supplements. It is a $32.7 billion industry in 2019 and is projected to have 2 percent growth annually over the next five years. Americans' increasing health consciousness, as mentioned in earlier sections, is pushing growth in this market as consumers turn to dietary supplements to manage their health. However, scandals and regulatory hurdles are threatening growth, and profitability is threatened as competition, and technological change disrupt stable revenue streams.



The supplement industry is segmented into traditional vitamins and minerals, herbs and botanicals, sports nutrition, meal supplements, and specialty products. Vitamins and minerals are the largest segment but have declined in the past five years. Herbs and botanical supplements include items like wheatgrass extract and ginkgo

leaf extract and are often products used historically to treat common ailments. Specialty products include items like fish oil, melatonin, and probiotics. Sports Nutrition includes protein powders, meal replacements, and weight loss products. This segment is growing well and is expected to continue to do so over the next five years. Demand in all these segments is dependent on population age, health and wellness trends, and scientific research. Growth will vary by segment.



The emergence of hemp-based health products from domestically produced crops is a highly disruptive force in the industry and may cause a shift in the marketplace. New product development is proceeding rapidly without the benefit of scientific research to back health claims and few laboratories to confirm product quality claims. These changes are creating opportunities for new players to arise in the industry.

Vitamin and supplement manufacturing facilities are concentrated in densely populated regions and located near vital upstream suppliers and downstream customers. Manufacturers prefer to be located near major downstream customers to maintain low distribution costs. Coastal regions are popular as they allow for more convenient importation of international ingredients. The Great Lakes region is home to a relatively small number of operations.

Success in the nutrition supplement sector depends a lot more on consumer preference and marketing than other industries. Additionally, regulatory issues can change with little warning. Key factors are:

- Production of goods currently favored by the market.
- Marketing expertise.
- Control of distribution arrangements.
- Ability to navigate regulatory requirements.
- Access to high-quality ingredients.

The Market

Interviewees frequently expressed a desire for expanded real estate options for launching or growing entrepreneurial food businesses. While the needs varied, the project team understood that demand could be segmented into three distinct types:

1. Specialized processing systems – Demand for this area is centered on the needs of individual users that desire access to:
    a. Cleanroom processing of natural products such as nutritional supplements requiring chemical or physical extraction of active ingredients with

additional formulation and clean room packing capability. A product quality testing lab would support this area.

   b. Allergy-free processing for gluten-free and vegan processed products ranging from dry mixes to hot and cold packed items.
   c. Segregated and secured storage to maintain chain of custody.

2. Commissary processing – Demand for this area is driven by varied users with a desire to have efficient processing for fresh and prepared foods that require limited access to configurable manufacturing areas with manual preparation areas, specific automation and mechanized processing capability, intermediate batching (100 -500 gallon batch size) capability, cook-chill, sous-vide, blast/IQF freezing, and MAP packing capability. This space is viewed as a shared-use space to be operated by a contract processor with the ability to manage shared space and support user needs.
3. Flex manufacturing/warehouse space – Demand for this area is driven by the need to provide flexible real estate options for small, growth-oriented food entrepreneurs given the shortage of flexible real estate options with appropriate design standards to support quick transition to food use.

Potential users for this space were identified in nearly all segments of the supply chain from farmers to retailers, restaurants, and food access programs. While the Terminal Market study did not set out to determine the need for processing and flex-use space, the ACDS project team feels compelled to identify and characterize the need. Also, the facilities, as outlined in the following "Facilities and Services" section of this memorandum, integrate well with the uses envisioned in the flex cold storage facility and would benefit from co-location.

At this time, the market analysis for this recommendation should be considered incomplete. It was not part of the initial research protocol for the project except to discover the need for minimal processing activities that may be related to terminal market activities. The project team found that the demand for additional entrepreneurial food processing and distribution space, both private and shared, was high based on comments such as these:

"There are few clean-room and lab-style processing environments to conduct product development, small-batch manufacturing, and quality testing services. It limits the development of the supplement and functional food market in Madison."

"Growing a food processing business in the Madison area is challenging because there is little in the way of speculative flex-manufacturing space that can accommodate our needs. This may mean our next growth phase takes us out of the region."

"Co-packing opportunities for products outside of traditional hot and cold packing lines are difficult to find, and this restricts entrepreneurial growth. The shortage of dedicated

facilities for allergy-free and gluten-free co-packing simply do not exist, even though it is one of the fastest-growing segments of the food industry."

The ACDS project team feels strongly that this need should be further explored through additional interviews and focus groups. Fall plans are to work with the food industry, food access providers, Feed Kitchens, Wisconsin Innovation Kitchen, Contract Comestibles, UW Cooperative Extension, and those businesses that have stated an interest in such space to explore these options further.

Key Success Factors

Speculative real estate development in the commercial and industrial sectors, especially in areas with specialized infrastructure requirements, requires an underwriting partner or strong commitment to public investment in the associated economic development benefits. Key success factors include:

1. Existing cluster strength
2. High level of start-up activity
3. Strong service and supply networks
4. Committed capital networks
5. University or private industry research linkages
6. Capable workforce

All of these assets exist in the study region, making further exploration a worthy effort.

Facilities & Services

Estimated facility needs are based on interviews to date and must be confirmed by further research.

Specialized food processing systems - This area of the proposed food center is estimated to require 20,000 to 25,000 square feet of purpose-built space to accommodate dedicated gluten-free processing. The team also recommends additional capacity to accommodate small-scale functional foods processing, including essential oils processing and other extractive technologies. This area should be designed to house 1-3 individual processors who are separately tenanted to maintain product segregation. Given the nature of the processing types, additional design considerations must be taken into account, such as segregation of air handling systems, additional water conditioning, and separate entrances and locker rooms. Processors would be encouraged to have long-term leases and would be responsible for tenant improvements.

Commissary kitchen – This area of the proposed facility is estimated to require 20,000 square feet designed to accommodate a wide range of uses. The largest portion of the facility would be operated as a co-packing facility for local specialty foods and would offer a job training center for industrial workers, a test facility for food development, and an equipment evaluation area for equipment manufacturers. A smaller portion of the facility

would be designed as a large catering kitchen to support start-up operators and allow for the expansion of local meal kit delivery.

Entrepreneurial flex manufacturing and warehousing – Entrepreneurial flex area is proposed at approximately 35,000 square feet to accommodate easily demisable units ranging in size from 1,200 square feet to 10,000 square feet. The intent is to provide small scale manufacturing and warehousing space to start-up and emerging growth businesses that have difficulty locating appropriately scaled facilities with in-place infrastructure. Furthermore, aggregating this type of space makes work-share and work-trade agreements more feasible in a tight labor market such as the one Madison is facing.

The activities in the entrepreneurial flex area integrate well with both the processing uses above and the cold storage activities proposed in the cold storage memo. The facilities could be successfully co-located with either use. This space shares facility and operational characteristics found in many terminal markets, though a key design feature for tenants is connectivity. For instance, these users will desire common areas such as shared offices and common interior corridors to facilitate intra-market trade.

The intent of all three proposed flex processing options is to enhance the viability of local food businesses by increasing the stock of food-ready real estate in the market, at scale that is appropriate for growth-oriented businesses. Except for a few users, this real estate option is not intended to be a permanent home for food companies. Because of this, businesses that enter this area must be appropriately vetted to ensure that they meet the growth objectives set forth and are adequately supported by outside, business development assistance. It is envisioned that varied lease structures and license agreements will be necessary to manage tenant space.

Budget Considerations

Given the wide disparity in the proposed user groups and development requirements, initial revenue projections are difficult to project. Based on the site uses proposed, development costs are expected to reach nearly $17 million.

Use	Specialized Processing	Commissary	Entrepreneurial Flex
Cost per Square Foot	$300	$280	$150
Square Feet	20,000	20,000	35,000
Total	*$6,000,000*	*$5,600,000*	*$5,250,000*

Recommendation

The ACDS, LLC project recommends moving forward with additional research on this topic to include additional focus groups and outreach with the real estate community. If the Local Team elects not to proceed with commissary and specialized processing, the project team believes strongly that some elements of the entrepreneurial flex space should be integrated within the cold storage facility.

TECHNICAL MEMORANDUM

DATE: **AUGUST 26, 2019**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **FLEX COLD STORAGE NEEDS AND SOLUTIONS FOR THE MADISON TERMINAL MARKET PROJECT**

This memorandum highlights and summarizes the data and findings of the ACDS, LLC study comport to cold storage, cross-docking, and logistics services requirements of local and regional food businesses pursuant to purposes and objectives of the Madison Terminal Market Project. This memorandum offers interim findings only and is intended to support a positive feasibility determination for the development of shared cold storage and related material handling and logistics services.

The memorandum is structured to introduce the critical data regarding the state of the industry both nationally and locally followed by an analysis of the specific local opportunity. It concludes with a brief financial analysis of the costs of new construction as well as estimates of operating revenues and costs as required to satisfy the demand projections. This analysis is offered at the magnitude of cost level and is intended to help make a determination of "Go" or "No Go" on further research.

General Industry and Market Analysis

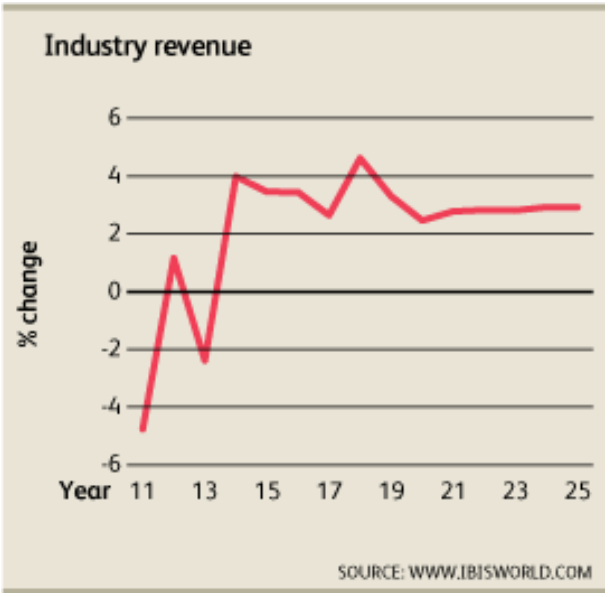
The Industry

The refrigerated storage industry had $5.5 billion in sales revenue in 2018, yielding 16 percent earnings before taxes, interest, and amortization[28]. The 56-county study region has $68 million in revenue, and Dane County operations see $17 million[29]. The industry is mature but growing and is made up of more than 1700 distinct operations nationwide, with 54 being in the study region and 5 in the county. The number of new operators entering the business each year grows at approximately 2.8 percent annually, which is up from 1.6 percent five years ago. While small players dominate the industry, increased merger and acquisition activity is evident as larger players consolidate to take advantage of efficiency improvements in facility design and operations.

[28] IBISWorld Industry Report 49312 Refrigerated Storage in the US, Dan Cook, August 2019
[29] Hoovers

Industry performance is driven by five key external factors:

6. Consumer spending – growth in spending on food increases demand
7. Total trade value – higher values of both imports and exports increase demand
8. Agricultural price index – declining prices results in more demand for storage
9. E-commerce sales – movement in and out of warehouses increases handling revenue and local fulfillment requirements for perishable foods
10. Freight transportation services index – increase in demand for shipping coincides with an increase in demand for warehousing which has been exacerbated by DOT rule changes and the reduction in refrigerated freight capacity



With the increase in service offerings and a technological capability that fits within client enterprise resource planning (ERP) systems, refrigerated warehouses are becoming more popular as a flexible storage option for manufacturers, wholesalers, and rapid order fulfillment operators working with online grocers. These market changes are enhancing demand for flexible cold storage options. Such options can be an integral part of the supply chain for companies that want to focus investment on core activities such procurement, quality control, and customer acquisition. Operators can succeed by providing well-positioned flexible storage in a high-density format with the ability to offer inbound and outbound services such as blockchain, multi-party food safety programs, order picking, repacking, freezing, and thawing.

Retailers and farmers are a secondary, but critical market for public, or shared cold storage. These two groups are driven by very different market fundamentals. Retailers are adapting to new store formats and online offerings that require access to flexible warehousing options. Small retailers, in particular, are burdened by the extra ordering costs associated with broken lot shipments and are unable to take advantage of lower-cost purchasing options because they lack cold storage warehousing. Farmer based demand tends to be seasonal. Farmers are using public cold storage to extend the marketing period for crops and are increasingly engaging in value-added processing that requires long-term cold storage for products such as fruit and vegetable purees.

To meet the additional demands for value-added services, flexible cold storage operators have vastly expanded the ala carte services they perform, have reprogrammed their ERP systems, and expanded workforce capabilities to become more firmly established as critical players in the supply chain. In this expanded role, cold storage operators are adding front-

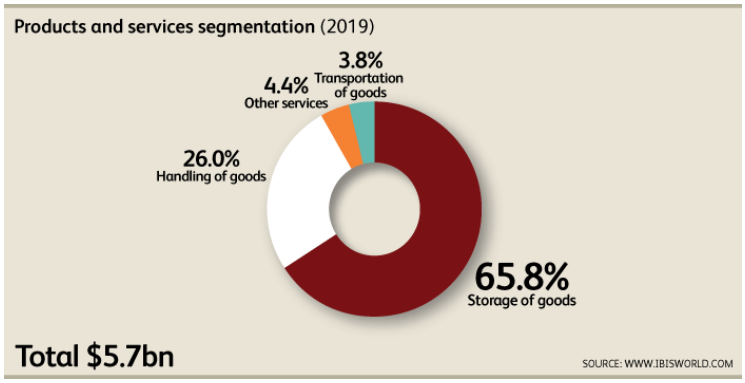
and back-end capability through services offered by the operator or through third parties. Key among these services are repacking, packaging, labeling, blast freezing, thawing, minimal processing, food safety programming, blockchain order fulfillment, cross-docking, local/long-distance transportation, regulatory filings, truck staging, and others as needed.

Proximity to the user base or fit within their logistics networks is also essential. Requirements for market proximity have caused a shift in the geographic location of cold storage facilities over the last five years, which is evident in the regional market. These factors combine to yield an overall favorable outlook for the industry with continued investment and growth over the next five years.

The Market

The refrigerated warehouse segment is characterized by steady demand created by myriad forces that mirror the general economy. This is largely due to the products and services that the industry sells. These can be broken down into three broad categories:

4. Storage of goods
5. Handling of goods
6. Transportation and other services



The chart to the right depicts the market segmentation by revenue. Storage of goods is the simple outsourcing of pallet, bin, and other bulk forms of cold storage on a short- or long-term basis and accounts for 65.8 percent of revenue. Much of this storage is done under multi-year contracts, whose length is sometimes driven by food manufacturing firms who need reliable access to inventory storage for use in just-in-time manufacturing operations. This storage function has become critical to offer buffering supplies, where manufacturers do not keep and hold excess inventory. Similarly, manufacturers who run their own sales offices —particularly within the protein segments—use flexible cold storage operations to preposition products within high demand markets to increase their ability to respond to quick changes in market fundamentals. Since they do not own the facilities, they can quickly amend their sales territories and sales programs.

Handling of goods differs from storage through an offering of value-added services that offer solutions for distribution issues. These include order picking, moving, and loading within the warehouse as well as packaging and marking. These services are growing in importance to the industry and currently represent 26 percent of industry revenue with the expectation that they may soon represent more than one-third of corporate revenue.

Operators are finding new ways to add value. For example, some provide transportation services with climate-controlled containers, generally over short distances. Some rely on outside service providers to support this function. As local transportation markets adjust,

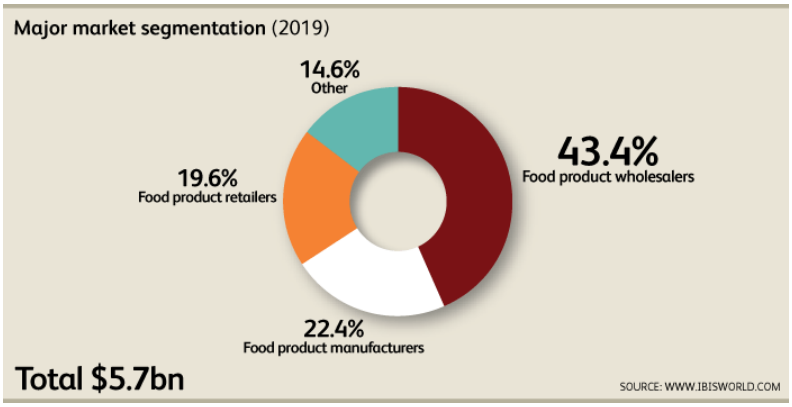
opportunities for specialized local carriers are arising. These specialized local carriers are often called trucker-jobbers. In their historic role, trucker-jobbers serve as mobile wholesalers, taking orders from local restaurants and retailers, purchasing on their behalf, and providing the last mile of delivery.

Other services that are rising in importance are logistics consulting technology services (SaaS) and full supply chain management. These services seem particularly attractive to small and midsize manufacturers, wholesalers, distributors, and retailers to help customers meet downstream demand efficiently. More and more are offering some minimal processing, such as blast freezing, breaking larger lots into smaller packaging, portion sizing, meal kit assembly, and pick and pull order consolidation.

Demand for the services outlined above is driven primarily by domestic consumption of foods followed by food exports and domestic pharmaceutical and nutritional supplement manufacturing. Because of this, the industry has strong upstream and downstream linkages within the related supply chains. It is important to understand that, as these relationships that exist within a community, the greater level of economic benefits are retained, and the higher likelihood there is of success in operating a facility.

Primary customers for the cold storage industry in 2019 are food wholesalers, retailers, and manufacturers. Demand grows as per capita disposable income increases, which allows customers to spend more on a variety of food products like frozen organic produce and ice cream.

Food product wholesalers are the largest market for refrigerated services at 43 percent. However, an increasing number of major food and grocery retailers purchase directly from food manufacturers and managing their storage internally. So, despite increasing consumer spending, this segment's growth is constrained by such wholesale bypass. Increasingly, this leaves smaller retailers, wholesalers, and distributors as the primary client base.



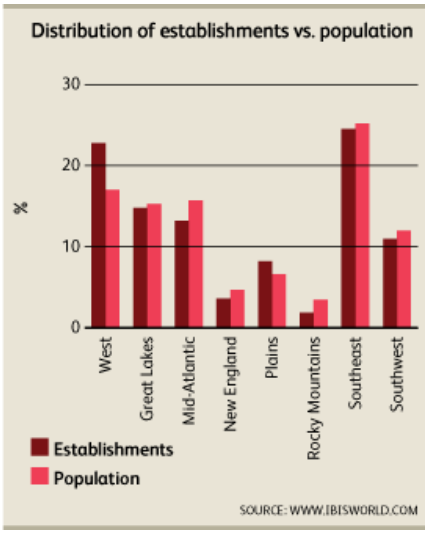
Food manufacturers are the second-largest market and represent a variety of food types from dairy and meat to frozen packaged meals. The share of revenue from that segment has dropped from 34 percent to 22 since 2016 as the share represented by other segments has grown.

Food product retailers are also important users of cold storage. Revenue from this segment has improved slightly from last year. Retailer demand is for space that fits within their logistics system requirements and is often filling the need for urban storage or is

transportation system centered. It is expected that as demand from this user group increases, it will be satisfied by building private storage that is fully integrated into the retailers' inventory management systems. This trend is already evident with the growth in cooperative storage options owned and operated by consortia of retailers, often in collaboration with vendors.

Other industries demand freezer and cold storage for wide-ranging reasons. The largest segment is trade-related, and these facilities are often centered around ports of entry.

As one would expect, cold storage is regionally centered around population densities and agricultural and food production areas. With its large share of livestock and crop producers, the Great Lakes region is the third-largest in the country. The region has 14.8 percent of all establishments and 16.4 percent of all employees. However, most of those these operations are in places like Chicago and Sheboygan County, though expansion of cold storage capacity is expected along the interstate corridors. There are only five refrigerated warehousing and storage businesses in Dane County, and they are operating a full capacity.



Competitive Factors

The cold storage market has seen remarkable growth in the last two decades with modest slowing since the recession of 2008 began. Because of this, and changes in technology utilization, company growth has come through consolidation and acquisition. Concentration in the industry favors more capital-intensive firms with the economies of scale. With such scale, they can leverage the specialist network required to keep facilities running a peak efficiency, employ automation, and to support the value-added services, such as import/export management, 3PL (third party logistics) programing, and food safety program management that are in high demand by manufacturers and foodservice companies.

The two largest players in the industry are Americold Logisitics, LLC with a 22.4 percent market share and Lineage Logistics Holdings, LLC with a 12.8 percent market share. Both are active in port-oriented marketing facilities as well as inland facilities tailored to domestic freight and logistics handling as well as packaging, repacking, and customs brokerage. Two additional companies each hold about 5 percent of the market, offer similar services, but are not active in the region. These firms are United States Cold Storage, a specialist in international trade, and Preferred Freezer Services, one of the earliest adopters of high-density storage with the logistics technology framework in the nation. Preferred Freezer is also part of a larger foodservice and food manufacturing conglomerate that operates many co-packing and co-manufacturing spaces across the United States.

Despite the trend in consolidation, most firms in the industry are small on both an employment and cubic foot basis. Almost 82 percent of all US facilities are less than 5 million cubic feet or 125,000 square feet. At the typical cold storage utilization rate of 28 percent, that equates to 6,500 to 7,500 pallet positions per facility. However, the trend in new construction is toward much larger facilities of 5,000,000 cubic feet or larger, and most of these are for public, versus private, use.

The following table highlights the cold storage availability within selected markets in the study region. It is clear from the table that Wisconsin is a large player in both the nation and regional marketplace with the fifth largest inventory of cold and freezer space in the US. The large number of meat and dairy manufacturing operations contribute heavily to this condition.

Cold Storage Availability by Study Area (1,000 cubic feet)			
	Wisconsin	Illinois	Iowa
Number of Facilities	95	29	25
Gross Refrigerated Space	103,068	22,866	11,551
Usable Refrigerated Space	74,815	19,576	8,945
Gross Freezer Space	125,044	165,135	38,752
Usable Freezer Space	105,059	132,334	28,607
Estimated Vacancy	5%*		
Sources: USDA – National Agricultural Statistics Service, Cold Storage Survey, *Industry Interviews			

Key Success Factors

The industry runs on a relatively simple product flow model. The costs associated with 100 percent fulfillment of this model are therefore straightforward and examine key success factors straightforward.

1. Utilization rates – Rent and utilities make up almost 14 percent of the operating costs of cold storage warehouses compared to 5 percent to comparative industries like refrigerated logistics, farm products storage, public warehousing, and other foodservice distribution. Therefore, designing facilities and operations to maximize storage utilization rates and reduce energy usage is critical to success. This is a key contributing factor to the high failure rate of wide-aisle, low-height common cold storage facilities.

2. Automation – Personnel is the largest operating cost in this industry. This is attributable to several factors, not the least of which is the unfavorable working conditions that require long break times and lead to higher error rates than in other "pick and pull" operations. Utilizing more automation leads to lower labor costs per pallet position, reduced errors, increased operating rates (due to lower lighting requirements and less heat transfer, and higher density racking.) All of this means more pallets per cubic foot and a lower operating cost per pallet position. Technological advancements are also driving more automation. Tracking inventory

with RFID and other wireless technologies enable automated storage and retrieval with users having real-time supply chain visibility as well as better control over inventory management practices.

3. Energy efficiency – Utility expenses are significant in this industry, and any effort to improve efficiency goes straight to the bottom line. Recent studies in the US and Europe indicate that new refrigeration technology and automation adoption can reduce energy use by 25 percent to 35 percent which translates to a profit enhancement of 31 percent.

4. Contracts – Solid facility utilization is required to get payback on automation and energy efficiency investments. As a result, the industry is increasingly looking to its customers to commit to five-year contracts to lock in minimum storage levels. Contracts often represent at least a portion of the expected efficiency gains but have the effect of locking small users out of the market.

5. Provision of facilities and services - Until recently, most cold storage warehouses were little more than "pick and pull" facilities. Customers would drop off products and pay separate charges for stocking, monthly storage, and removal of products. To make better use of personnel, companies began to offer value-added services to support the customer base. These included having specialized facilities for packaging, sorting, order assembly, freezing, chilling, thawing, logistics, trailer rental, freight brokerage, export/import processing, freight processing, and even truck services. Food safety programming or the ability to support various food safety programs such as GlobalGAP, BRC, SQF, and others is imperative, as is blockchain and distributed ledger capability. These services are offered a la carte and represent a significant advantage in attracting contractual clients as well as maintaining profit margins.

6. Direct access to transportation hubs – the refrigerated warehouse industry is supply chain driven. It must fit economically within the supply chain of either its supply or demand industries. Facilities with direct access to key transportation infrastructure, such as Interstate highways, rail, and ports, will generally have an advantage over those that are not in major transportation corridors. There are exceptions to this rule, such as locating the facility next to a large user, but these are rare.

Collectively, this section tells us that success in a new facility depends on efficient design of building and operations combined with modern services and amenities sufficient to attract contract users. Overdesign and building excess capacity without a clear buyer for space will greatly challenge feasibility.

Demand Analysis

Local Opportunity

The study region is home to many food manufacturers, retailers, and growers that are seeking refrigerated warehouse space. The market has responded by adding facilities, most of which are privately owned and operated. Out of the 57 facilities in the region, only five operate in Dane County, and these are at full capacity. This situation meant that the common cold storage shortage was a frequent interview topic.

According to one user, "We have a hard time getting regular deliveries into Madison because of the DOT rules. So, we need to order larger volumes which are difficult to store because we have no warehouse. If there is a mistake in an order, we are sometimes without a product for several days. Finding a warehouse solution is important, but we can't afford one on our own." Furthermore, local retailers and manufacturers are looking for additional services such as local delivery and processing space for adding value. The market for freezer space is relatively straight forward and demand simple to model but adding the additional parameters will require more complicated planning.

Table 5 Demand by segment per interviews

Supply Chain Segment	Storage Type	Storage Term	Estimated Pallets Required	Number of Users Interviewed
Fruit and Vegetable Growers	Seasonal cold, ripening, and controlled atmosphere	Short to medium	3,000	3
Food Manufacturing	Raw material, intermediate products, conditioning, and finished goods	Short to long	3,000	2
Distributors and wholesalers	Load assembly and consolidation	Short to long	1,200	5
Retailers	Off-site inventory management	Short to medium	400	5
Transportation providers	Cross docking and on-going operations	Short to long	2,500	4
Nutritional supplement and Pharmacology	Raw material, intermediate products, and finished goods	Short to long	200	1
Other	Short-term and seasonal	Short to long	100	1

Small Lot-Size Storage

With few exceptions, demand for storage space in the region is small, under 40 pallets, and is driven by seasonal and market cycles. Low numbers like that mean that traditional cold storage providers are unlikely to accept these users. The impact on small businesses is real with more than one retailer citing the impact on stocking decisions and price points. "Our price points are often higher than national and regional stores because we have no place to store large volume purchases. So, we miss out on deals" – small retail owner.

The need is currently unmet, but the number of users yields a total demand of more than 10,000 pallet spaces. For example, small retailers—many in minority and disadvantaged neighborhoods—have insufficient onsite storage and would like access to local cold storage that enables just-in-time delivery. Such an operation would improve their purchasing power and allow the stores to reduce prices.

Aside from the lack of access due to size, two main subjects arose as issues during interviews with retailers and manufacturers. These local businesses are looking for additional delivery and transportation options as well as co-packing and manufacturing space.

Transportation

Transportation is presenting serious challenges to the food industry nationally and locally. Madison's geography and distance from metropolitan areas present additional unique issues. DOT rules make delivery from Chicago and Minneapolis difficult to turn around in a single day. Local traffic issues and city layout amplify that difficulty.

To the extent that the market area is being served by out of town wholesalers, the delivery windows are narrowing due to transportation regulations. The effects of these are reduced delivery hours, fewer days of services, limited delivery options, and the occasional stranded truck. Wholesalers have attempted to compensate for this condition by putting more trucks on the road, which has increased demand for drivers in an already short labor market. It also has increased the instance of less-than-truckload deliveries, which increases the financial burden on wholesalers and the use of minimum order levels for small accounts.

Interviews with users within Madison confirmed the project team's initial findings. One user said, "Distribution companies simply can't afford to risk having their trucks shut down on our docks because of driver limits, and we can't have trucks parked at the dock for half of a day."

A tight job market adds another layer of difficulty according to another interviewee. "Local and long-distance transportation are some of the greatest challenges facing our industry. Furthermore, new DOT rules and hot labor market make it difficult to find drivers." The idea of collaborating on storage with load consolidation and local delivery options was therefore attractive to users both inside and outside of the market. One national-level 3PL provider expressed interest in cross-docking to a local delivery company due to the number of times its trucks had been stranded in the region.

Processing:

While not part of traditional cold storage warehousing, processing capacity is a small but growing segment in some markets. Entrepreneurs in Madison are looking for additional space to develop and manufacture food products:

- "Co-packing opportunities for products outside of traditional hot and cold packing lines are difficult to find, and this restricts entrepreneurial growth."
- "Growing a food processing business in the Madison area is challenging because there is little in the way of speculative flex-manufacturing space that can accommodate our needs. Our next growth phase may take us out of the region."

An additional complication is a growing need for processing space that caters to special dietary needs, which is also lacking in Madison. One interviewee said, "the shortage of dedicated facilities for allergy-free and gluten-free co-packing simply do not exist, even though this is one of the fastest-growing segments of the food industry." Another presented the same problem, saying "there are few clean-room and lab-style processing environments to conduct product development, small-batch manufacturing, and quality testing services, and that is limiting the development of the supplement and functional food market in Madison."

While the project team believes that these opportunities should be collocated with, or have near adjacency to shared cold storage, processing and co-packing opportunities are discussed in a separate memo.

Commonly requested services:

User requirements represent common service elements that are typical of third-party cold storage. The users' needs are sufficiently alike to indicate viability at the simple facility and service level. The following table highlights user requirements. Users are not identified by name or industry but expected facility utilization.

Facility & Service Requirements	Large	Intermediate	Small
Year-round contracted demand	X	X	X
Short-term, seasonal, & overflow demand	X	X	X
Dedicated/private docks	X	X	
Dedicated/private packing and loading	X	X	
Blast cooling/freezing required onsite	X		
Load assembly	X	X	X
Palletizing/depalletizing	X	X	X
Sort & repacking	X	X	X
Pick and Pull operations	X	X	X
Repacking	X	X	X
Consumer pack/club pack	X	X	
Labeling and coding	X	X	
MOD & Display Building	X	X	
Minimal processing – e.g, Portioning	X	X	X
Product thawing and preparation	X		

Expedited import/export paperwork and clearing	X		
Industry Standard Food Safety Programs (e.g., GFSI, SQF & BRC)	X	X	X
Full product traceability and inventory tracking - bar code or TTI	X	X	X
Complete IT solutions	X	X	
LIFO & FIFO inventory management System	X	X	X
Power redundancy	X	X	X
Proximity to Interstate	X	X	X
Local Distribution	X	X	X
Trucking services and logistics support	X	X	
Truck washing and truck service	X	X	X
Load consolidation	X	X	X
Cross Docking	X	X	
Load Assembly	X	X	X

The prospective users, while recognizing the need for simple cold storage solutions, did see the benefit to services beyond those listed above. Much of the identified need was related to accommodating future trends in just-in-time fulfillment of Internet orders, increased requirements for full supply chain visibility using complete technology integration, shorter order cycles, and integration of front- and back-end technologies (Industry 4.0). With all these changes, the potential cost savings of shared facilities and services are viewed by many as a risk management strategy that is only available in a user-controlled, share cold storage environment.

To be considered a viable option, any proposed new facility must be modern and efficient with professional management. It must be able to compete at or near the long-term cost curve for the industry while meeting all modern food safety standards. As noted above, it must also support modern front- and back-end technology requirements of the supply chain.

The facility design characteristics proposed to meet the above requirements are defined in the next section of this memo. These criteria are, for now, quite general, as the final user base and operating requirements can have a significant influence on the cost of the ultimate design.

Site selection for the facility, however, is more complicated. It is recommended here for a new building as an example only. Site selection will ultimately be a matter of satisfying the demands of the users while optimizing the choice of systems such as technology, racking, and automation. None of the following rules out the former Oscar Mayer site for use as a cold storage facility.

Facilities & Services

The demand for freezer storage and services presented in the previous table yields a picture of a very straight forward common cold storage facility offering import/export services.

Design Program

The understood demand translates to a minimum design capacity of 10,500 pallet positions to accommodate for normal pallet position vacancy due to operations. Adding seasonal requirements, the facility's initial design capacity for storage may necessitate additional positions. However, the project team had insufficient input to assess such needs. At a warehouse allocation of 3.5 square feet per pallet for 7 high racking systems in multiple temperature zones from -20 to 55 degrees Fahrenheit, this portion of the facility will require approximately 36,750 square feet with a clear height of 55 feet to accommodate the full pallet storage requirement.

Loading and unloading require sufficient interior transitional floor allocation and food segregation areas to keep regulated food separate. As well, the facility must be able to accommodate product flow-through that segregates outbound and inbound shipments. Based on the expected truck turnover, seven sealed doors should be sufficient to manage traffic with an allocation of three each for fresh meat and poultry receiving, and one for fruit and vegetable receiving. Three outbound freight doors are sufficient for expected load volume.

The ability to handle trailer load volumes of blast freezing onsite adds the requirement to stage and process up to 18 pallets of product at a time and as many as 90 pallets per shift. Outbound thawing for intermediate products moving out for value-adding processing may require up to 18 pallet positions of thawing. Ideally, these services will be offered using the same equipment, such as a Tippmann QF+ rack-based blast freezing/blast thawing system.

Inbound freight may require sorting and repackaging, with space allocated for this purpose at approximately 3,000 square feet plus blast freezing at approximately 600 square feet. Staging, packing, repacking, and labeling activities may be required on the outbound side of operations for an additional allocation of 4,000 square feet.

The facility will also require office facilities, restrooms, locker rooms, as well as facilities for USDA officials. The total allocation for administrative and overhead uses, as well as plant and equipment rooms, is 1,800 square feet.

It is envisioned that the facility will not be fully automated, but instead will use limited automation through basic 3PL warehouse programs and gravity feed racking to ensure proper inventory management. As a note, new facilities such as these can be efficiently designed to have fully automated warehouses with no personnel needed for warehouse operations. Automation adds significantly to the capital costs of the facility but can reduce operating costs for personnel and energy by as much as 35 percent. Analysis of these systems goes beyond the scope of this project.

Use	Area	Special Notes
Warehouse	36,750 ,000 square foot (sf) minimum area required for current demand.	High cube ~ 55-foot clear span using high-density gravity feed racking to maintain LIFO & FIFO inventory systems. Narrow aisle with automation. Space will be zoned to be held between -20 to +55 F
Dock and freight handling	8,000 sf	Area maintained between 26 and 31 degrees. Minimum of seven dock doors and minimum 28-foot clear height
Product Processing and Repacking	22,000 sf	Area maintained between 26 and 31 degrees with a minimum 28-foot clear height
Administrative and common areas	1,800 sf	Offices, restrooms, USDA facilities, locker rooms, common areas, and plant.
Total	*68,550 sf*	

Products and Services

The proposed facility will operate primarily as a storage and handling facility for sub-zero food products. Such a business typically charges a basic level of service fees for in-out service and storage as well as incidental fees for pallet wrapping, pallet replacement, sorting, coding, documentation, and inventory reporting. Additional services will include blast freezing, thawing, labeling, order pulling, repacking, import/export documentation, trucking, managing customer EDI interface, and load assembly. These services will be priced on an á la carte basis.

Base Financial Projections

The purpose of this section is to model the basic development and operating costs associated with the facilities and services presented above. Costs and revenue estimates are magnitude-of-cost only and are based on interviews with freezer storage operators and refrigerated warehouse construction companies. Therefore, costs can be used for advisory purposes only.

Capital Costs

Each of the two sites investigated as part of the project requires full greenfield development including site acquisition, surveys, onsite and offsite improvements, design and engineering, construction, impact fees and permits, cost certification, project financing, furnishings, fixtures, and more. At this point, these costs will be estimated as if the site chosen is pad ready with all necessary utilities at curbside.

Development Budget

Cost Element	Cost	Percent of Total
Site Acquisition	$0	0%
Architecture, Engineering, and Process Design	$300,000	2%
Site Development	$465,000	3%
Facility and Fixtures	$13,961,250	82%
Automation and IT technology	$1,500,000	9%
Contingencies and Soft Costs	$698,063	4%
Total	$16,924,313	100%

At the projected full development cost of $16,924,313, the project can be completed at $203 per square foot which is at the high end of the range for construction of such facilities ($175 to $210 per square foot). The cost is associated with the blast freezing and thawing requirements of the facility as well as the level of automation. Each of the above line items is discussed in more detail in the following text.

I. Site Acquisition

It is assumed that the site will be acquired at minimal cost if the project meets basic economic development criteria such as investment, job creation, tax base enhancement. As an alternative, the design program may be amended to fit an existing facility such as the Oscar Mayer site or new flex warehousing facilities.

II. Architecture and Engineering

The architecture, engineering, and design phase of the project could run through a wide range of options based on site characteristics, regulatory requirements, and process design criteria. Given that some level of fresh and frozen poultry handling will be done, the facility will be a USDA-inspected facility and must meet USDA plant requirements, which will require design and review by experienced engineers. The addition of blast freezing and thawing requirements may add process engineering to manage product flow and handling. With this in mind, ACDS is using a place holder of $300,000 until bids can be received from qualified firms.

III. Site development

For the purposes of this study, it is assumed that utilities are available at the site, and it will have limited development needs that include ingress and egress lanes, onsite utility improvements, drive lanes, landing gear pads, and parking areas. For purposes of this report, site development costs are allocated at $465,000.

IV. Facility and Fixtures

Facilities and fixtures include the building, and full fit-out of the facility including high-density racking, automation, and physical plant are estimated at $185 per square foot and supported by interviews with Tippman Engineering. Each area of the plant is allocated a separate per square foot cost to reflect the level of asset investment and finish required.

Other fixed assets such as furnishings and enterprise software are allocated at an additional $5.00 per square foot. A modest level of automation, including a basic conveyor, pallet builder, and stacker cranes are assumed in the per square foot cost allocation. Product processing and repacking areas require additional equipment and automation technology, thereby increasing costs.

Use	Area (SF)	Cost/SF	Total
Warehouse	36,750	190	$6,982,500
Dock and freight handling	8,000	120	$960,000
Product Processing and Repacking	22,000	240	$5,280,000
Administrative and common areas	1,800	220	$396,000
Facility Subtotal	68,550	198.67	$13,618,500
Fixtures & Enterprise Software		5	$342,750
Total	68,550	*203*	$13,961,250

V. Automation and Information Technology (IT)

The facility's utility may increase dramatically with the appropriate application of frontend and backend IT solutions. These applications must be integrated into the ERP system that is selected by the facility manager as well as the automation software used to run the facility. Based on an interview with ARCO material handling the costs of software and certain control systems is estimated at $1,500,000.

VI. Contingency

Contingencies may arise in construction or site preparation and are allocated at 5 percent of the facility and fixtures budget, or $698,063.

VI. Options and variations

There are many racking, automation, and equipment configurations that can change both the capital and operating costs of the facility. Chief among these is the level of automation selected for the facility.

Operating Costs

It is assumed that the facility will operate at the same level of efficiency as all modern freezer plants given the level of automation selected and the services offered. On a magnitude of cost basis, operating costs are expected to be approximately $4 million annually, based on an examination of the costs for comparable facilities and as presented below.

I. Labor is the most significant cost associated with operating the facility even though the facility requires few employees. The staff is typically divided into an engineering team capable of operating a CO2 or ammonia system that requires sophisticated training and 24-hour monitoring. The facility will also require a well-qualified manager and clerical staff capable of preparing import/export paperwork and accurately managing a sophisticated

inventory tracking system. Other than these technical employees, the plant will require material handling operators.

Employee Class	#	Salary	Wage	Hours	Benefit Rate	Total
Facility Manager	1	$180,000			15%	$207,000
Plant Engineer	2	$76,000			15%	$174,800
Systems Engineer	1	$150,000			15%	$172,500
Refrigeration Tech	2	$65,000			15%	$149,500
Clerical	2	$42,000			15%	$96,600
Material Handler	20		$16	2000	15%	$736,000
Truck Driver	5		$30	2000	15%	$345,000
	33					$1,881,400

II. Purchases of supplies and services are estimated at $208,634 and include pallets, spacers, packaging, and professional services.

III. Energy, maintenance, and utilities are the next largest costs of the facility and are estimated at $258,005.

IV. Interest payments on capital expenditures based on amortizing these over 20 years at 6 percent yields an average annual interest expense of $1,003,167.

V. Inspections and regulatory fees account for nearly 5 percent of costs and are expected to run approximately $145,250.

VI. Additional expenses such as depreciation and marketing are expected to run approximately $560,850 annually.

Service Pricing

Services will be priced to recover cost and yield a normal operating profit. Based on the user profile, the facility is expected to yield a revenue of $46 per pallet position annually on 8,200 occupied units. This utilization rate yields annual sales of $4,526,400. Please note that these estimates are likely to undercount the revenue from services such as repacking, pick and pull, and blast freezing and thawing operations.

Initial Financial Feasibility Statement

Based on expected revenue of $4,526,400 and operating costs of $4,057,305, the facility should yield an operating return $469,095 before principal payments of $451,845. Net cash from operations is expected to be $17,249 indicating the project will cash flow at the projected revenue level.

Given the preliminary nature of planning for the project, these projections seem to support further analysis to include the development of a full design program based on detailed product flow and service requirement interviews, and confirmation of demand through letters of intent.

Site Selection

The proposed facility requires a site of 7 acres or larger to accommodate the building footprint and operating apron. Environmental conditions and the availability of public water and sewer will also affect the site requirements.

In terms of municipal services, it is preferred that the site be served by public water and sewer. Because the water and sewer needs for processing are generally for wash down and sanitary needs of personnel, the facility should not put an excessive burden on the municipal system or have significant well and septic needs. Municipal and well-water will need to be approved and certified by testing for food plant use.

Energy requirements for the facility for both primary power and backup power are significant. The site must be served by 1,200 KVA electric service as well as natural gas.

Recommendation

The ACDS, LLC project recommends moving forward with the next phases of this project. These would include engineering and design as well as the development of a full operating and management plan for the facility.

MEMORANDUM

DATE: **JUNE 27, 2020**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **MADISON TERMINAL MARKET PUBLIC BENEFIT CORPORATION VALUE STATEMENT**

Below you will find the updated benefit statement with the updated milestone matrix. The last column of the matrix links the benefit statement to the highlighted activities over the first 5 months of the pop-up market.

Core values

The [Madison Terminal Market] reflects the values of Wisconsin. We encourage vibrant and strong local economies driven by collaborative innovation and an empowered workforce. We seek to optimize market access and food access to serve both rural and urban communities, while doing no harm to human and natural systems.

I. *Provide a market for small and mid-sized wholesale farmers and newly emerging supply chains.*
   a. Encourage collaboration among supply chain participants & market tenants to improve efficiencies and spur innovation
   b. Expand access to new market opportunities for both rural and urban businesses and communities
   c. Provide a platform and tools to enable innovation
   d. Commit to investing in and building networks of small and medium-sized enterprises (SMEs) and women- and minority-owned businesses (MWBEs)
   e. Increase the competitiveness of SMEs and MWBEs
   f. Commit to investing in local/regional food and farm businesses

II. *Create opportunities for more collaborative and efficient regional and last mile distribution and new transportation businesses.*
   a. Improve food logistics through load matching and route planning for better vehicle utilization, to reduce trips, improve customer service and working conditions for drivers.
   b. Support the electrification of regional and local freight transportation and the use of other innovations in tractor-trailer design that reduce emissions and decarbonize freight transportation.

III. *Ensure access to healthy foods for rural and urban residents.*

a. Improve access to food for rural and urban communities, especially those underserved by vertically integrated and conventional e-commerce supply chains.
b. Improve integration of food access providers with technology and programmatic efforts to increase the use of nutrition assistance programs.
c. Invest in and partner with community organizations working to increase food access, health, and nutrition. (civic engagement and giving

IV. Reduce food and energy waste throughout the food supply chain.

a. Commit to regional and last mile food logistics that improve distribution efficiency
b. Reduce wasted food by improving distribution logistics and compost as needed
c. Reduce wasted energy, especially refrigeration, through continual innovation

V. Maximize the positive impact on the local and regional food economy.

a. Retain and create jobs in the food supply chain
b. Enhance workforce capability and job training programs
c. Invest in the next generation of food, farm, freight and related businesses
d. Invest in and support SMEs, MWBEs, and local economic development
e. Place people at the center of all operational and management activities (it's not always about AI and automation)
f. Reinvest in rural economies and underserved communities

VI. Commit to serving the public good.

a. Enhance transparency across the food supply chain by providing information on where food is coming from via website, blockchain, branding, etc.
b. Allow customers to trace the journey from farm to plate
c. Commit to transparency in business governance with demonstrated commitment to social benefits

VII. Leverage intellectual and natural capital of southern Wisconsin to foster innovation in the regional agri-food system.

a. Demonstrate the innovative capacity of Wisconsin's rural and urban business culture
b. Capitalize on the region's natural resources, including fresh water, rich agricultural land, and a robust and diversified regional agricultural sector
c. Engage partners at the University of Wisconsin system to advance technology commercialization for the benefit of small and medium-sized food and farming organizations
d. Encourage cross-purpose corporate and philanthropic investment in social innovation around the food system
e. Engage collaborative partnerships between economic development partners, including MadREP, colleges, universities, intermediary organizations, and private businesses to encourage innovative technology commercialization and innovation sharing

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Agencies	Relationship to B-Corp Mission
1	Secure site and finalize commercial 5-year lease	8/10/2020	Grant commitment letter	M1: Complete lease M2: Complete start-up work list M3: Fit out site	NPC	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) V (a,b,c,d,e,f) VI (a,b,c) VII (a,b,c,d,e)
1	Finalize SOPs and MOUs with participating pilot locations.	8/31/2020	Hire staff or contractor Hire legal counsel	M1: Complete lease agreements, legal forms, and terms of service M2: 5 SOPs and MOUs	NPC Legal counsel ACDS UW	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) VI (a,b,c) VII (a,e)
1	Implement a refrigerated locker system at seven locations with supporting distribution routes and home delivery.	8/31/2020	Refrigerated locker system Utilities and internet access Insurance	M1: Purchase and set up lockers M2: Successful end-to-end test M3: Training session for retailers, suppliers, and couriers	NPC T4 Solutions ACDS Food pantry and food bank partners	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) VI (a,b,c) VII (a,e)
1	Develop and implement a maintenance plan.	Ongoing	Hire staff or contractor(s)	M1: Maintenance plan	NPC Maintenance service provider	
1	Initiate and test delivery routes.	8/31/2020	Trained and properly licensed drivers FMCSA Motor	M1: Take delivery of delivery vehicles. M2: Hired trained and ready drivers	NPC Ryder Logistics Third-party registration firm	II (a) III (a,b,c) IV (a) V (c,d,e) VI (a,b,c)

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Agencies	Relationship to B-Corp Mission
			Carrier Account DOT Number Logistics software	M3: Completed DOT paperwork and initial interview M4: Test routing and logistics software	ACDS Food pantry and food bank partners	
1	Develop and implement a food safety plan	8/31/2020 & Ongoing	Hire staff or contractor	M1: Food safety plan M2: Recall plan & test	NPC	
1	Develop and launch an online ordering platform or work with participants to develop necessary e-commerce technologies.	8/31/2020	Hire staff or contractor Web development services Cloud hosting	M1: Complete wireframe M2: Launch ordering platform (website) M3: API for e-commerce integration M4: First successful transaction	NPC Web development services T4 Solutions	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) V (a,b,c,d,e,f) VI (a,b,c) VII (a,b,c,d,e)
1	Work with project partners and locations to minimize technology or cultural barriers.	8/31/2020	Hire staff or contractor	M1: Phone and email order system M2: Plan for accepting orders from elderly M3: Plan for accepting orders from disabled individuals	NPC All partner agencies	II (a,b) III (a,b,c) V (,d,e,f) VI (a,b,c) VII (d,e)

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Agencies	Relationship to B-Corp Mission
1	Partner with food pantries and the food bank.	8/31/2020	Hire staff or contractor	M1: SOP and MOU for each partnership M2: First food pantry or food bank delivery	NPC All partner agencies	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) VI (a,b,c)
2	Coordinate aggregation with suppliers and distribution of products through distribution partner(s).	9/15/2020	Hire staff or contractor	M1: Complete service route M2: Backhaul agreement(s) M3: First grocery delivery M4: First CSA delivery	NPC All partner agencies	I (a,b,c,d,e) II (a) IV (a,b,c) VI (a,b,c)
2	Finalize SOPs and MOUs with participating suppliers and distributors.	9/15/2020 and ongoing	Hire staff or contractor	M1: SOP and MOU for each partnership	NPC Suppliers Legal counsel	I (a,b,c,d,e,f) II (a,b) III (a) IV (a,b,c) V (a,b,c,d,e) VI (a,b,c)
2	Coordinate aggregation with suppliers and distribution of products through distribution partner(s).	9/15/2020 and ongoing	Hire staff or contractor	M1: Complete service route M2: Backhaul agreement(s) M3: First grocery delivery M4: First CSA delivery	NPC All partner agencies	I (a,b,c,d,e,f) II (a,b) III (a,b) IV (a,b,c) V (f) VI (a,b,c)
2	Create awareness and increase sales through	9/30/2020	Marketing materials	M1: Marketing plan M2: Social media plan	NPC All partner agencies	III (a,b,c)

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Agencies	Relationship to B-Corp Mission
	marketing campaigns.			M3: Create print and digital content, disseminate		
2	Explore ways to increase SNAP redemption.	9/30/2020	Hire staff or contractor	M1: Increase redemption by 25% from baseline	Nutrition Educator and Outreach Specialist	III (a,b,c)
2	Track and report sales and customer trends by analyzing locker usage activity and online ordering platform data.	Ongoing from 9/30/2020	Hire staff or contractor	M1: Determine baseline and targets after the first month. M2: Monthly reports.	NPC Evaluation Specialist	I (a,b,c,d,e,f) II (a) III (a,b,c) IV (a,b,c) VI (a,b,c) VII (a,b)
3	Develop and disseminate promotional material through print and digital media.	10/31/2020	Hire staff or contractor Marketing material Custom wrap for lockers and trucks	M1: Custom wrap that features nutrition education material M2: Brochures and flyers, dissemination M3: Digital newsletter for customers, dissemination	NPC All partner agencies	III (a,b,c)
3	Launch a marketing campaign and determine the best approaches to influencing	10/31/2020	Hire staff or contractor	M1: A/B test results	NPC All partner agencies	I (e,f) III (a,b,c) V (f) VI (a,b,c) VII (a,b)

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Agencies	Relationship to B-Corp Mission
	purchasing behavior.					
3	Increase healthy eating behavior through education and outreach activities.	Ongoing from 10/01/2020	Hire staff or contractor	M1: Increase consumption of fresh produce by 25% from baseline. M2: Increase the Healthy Eating Index (HEI) by 25% from baseline.	NCP UW Extension	III (a,b,c)
4	Solicit feedback through surveys, focus groups, and interviews.	Ongoing from 10/31/2020	Hire staff or contractor Meeting rooms Materials for printed surveys	M1: Pre-pilot survey M2: Mid-pilot survey M3: Post-pilot survey M4: 12 focus groups	NPC All project partners	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) V (a,b,c,d,e,f) VI (a,b,c) VII (a,b,c,d,e)
5	Gather and analyze live data from the grocery lockers, warehouse and online ordering platform.	Ongoing from 9/30/2020	Hire staff or contractor	M1: Summative data analysis	NPC All partner agencies	I (a,b,c,d,e,f) II (a,) III (a,b,c) IV (a,b,c) V (a,b,c,f) VI (a,b,c) VII (a,c,d)
5	Examine program design, operation protocols, and team function to identify areas of improvement	11/31/2020	Hire staff or contractor	M1: Internal surveys M2: Develop case study, guide, best-practices memo M3: Disseminate	NPC All partner agencies	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) V (a,b,c,d,e,f) VI (a,b,c) VII (a,b,c,d,e)

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Agencies	Relationship to B-Corp Mission
	and best practices for implementing projects of this nature and scale.			findings through local, state, national networks		
5	Refine business model.	11/31/2020	Staff and outside consultants	M1: Draft sustainability strategy M2: Present to stakeholders	NPC All partner agencies	I (a,b,c,d,e,f) II (a,b) III (a,b,c) IV (a,b,c) V (a,b,c,d,e,f) VI (a,b,c) VII (a,b,c,d,e)

MEMORANDUM

DATE: **JUNE 19, 2020**

TO: **GEORGE REISTAD, PROJECT MANAGER**
MADISON TERMINAL MARKET PROJECT

FROM: **ANNA R. JENSEN, TEAM LEADER**
ACDS, LLC

RE: **MADISON TERMINAL MARKET COMMUNITY IMPACT**

Overview

The Madison Terminal Market is planned as a low-density cold storage warehouse facility that will provide flexible space for various wholesale distributors and food processors. The market will also offer business development and technical assistance services to support tenant growth. Jobs and economic growth will be generated in Dane County by both the construction of the terminal market and the creation of the market management company. Most importantly, its existence and support services will help tenants grow their businesses. The project expects to start with six tenants, most of whom are produce wholesalers.

Our analysis indicates that the combination of construction, market management, and tenant activities will directly create about 261 jobs and generate $74.1 million in economic output. Indirect and induced impacts will create an additional 306 jobs and $49.3 million for a total of 570 jobs and $123.4 million in output. This significant multiplier effect suggests that there is a good return on investment, as every $1.00 of investment into this project will generate another $0.70 in output. Our analysis is based on assumptions from the low-density warehouse memorandum and the economic model provided through IMPLAN.

The key sectors that will be impacted include commercial construction, grocery wholesaling, management firms, real estate, restaurants, business support services, employment services, building services, and food manufacturing. Through the creation of jobs and providing employment benefits, there will also be an increase in homeowners, insurance policy holders, and healthcare spending.

Table 6. Total Impact

Impact Type	*Employment*	*Labor Income*	*Total Value Added*	*Output*
Direct Effect	260.8	$19,249,949	$27,077,148	$74,138,263
Indirect Effect	170.5	$11,269,617	$16,251,202	$28,602,411
Induced Effect	138.8	$6,991,821	$12,562,454	$20,821,376
Total Effect	569.1	$37,440,024	$55,802,003	$123,383,674
Multiplier	2.2	1.9	2.1	1.7

Breakdown of Impact

This analysis combines the impact of construction, market management, and tenant activity. The key assumptions include the following:

1. Activities occur in 2020 with impacts restricted to Dane County. The facility will be located and built in or near Madison, WI.
2. Construction costs $16,924,313. This covers the architecture, engineering, and process design process. It also includes site development, facility construction, permanent fixtures, permanent automation and IT technologies, other soft costs and contingencies.
3. Sales and employment are expected to be local for both the market management firm and the tenants.
4. For the market management firm, the model assumes direct sales in the first year to be about $178,376. There is also one full-time employee with a salary of $71,364. The firm will also spend about $156,000 in capital investments/expenses and $66,245 in operating expenses. The local purchasing percentage (LPP) for each expense is based on the SAM Model Value generated by IMPLAN.
5. The model assumes there will be six tenants. Five of the tenants are wholesalers, and one tenant is involved in food manufacturing. The wholesaling sectors will generate an estimated $252,050,000 in direct sales, 121 direct jobs, and $8,671,207 in direct wages. The food manufacturing sector generates an estimated $19,250,000 in direct sales, 20 direct jobs, and $877,001 in direct wages.

Table 7. Construction Impact

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	118.5	$8,385,453.30	$9,776,517.40	$16,835,185.70
Indirect Effect	19.0	$1,340,332.00	$2,153,420.70	$3,907,478.60
Induced Effect	44.5	$2,242,476.30	$4,027,683.80	$6,676,743.60
Total Effect	182.0	$11,968,261.60	$15,957,621.80	$27,419,407.90

Table 8. Market Management Impact

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	1.4	$98,280.00	$126,450.60	$245,578.10
Indirect Effect	0.6	$45,376.90	$66,523.40	$102,502.70
Induced Effect	0.4	$21,932.20	$39,421.60	$65,326.50
Total Effect	1.4	$94,225.20	$143,593.50	$235,031.60

Table 9. Tenant Impact

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	141.0	$10,766,216.10	$17,174,180.00	$57,057,499.50
Indirect Effect	150.9	$9,883,908.10	$14,031,258.40	$24,592,429.60

Induced Effect	93.8	$4,727,412.90	$8,495,349.00	$14,079,306.00
Total Effect	385.7	$25,377,537.00	$39,700,787.30	$95,729,235.00

Top Sectors Impacted

Table 10. Top 10 Sectors by Employment

Description	Direct	Indirect	Induced	Total
Wholesale - Grocery and related product wholesalers	121	7	1	129
Construction of new commercial structures, including farm structures	119	0	0	119
All other food manufacturing	20	0	0	20
Management of companies and enterprises	1	17	2	18
Other real estate	0	11	4	15
Full-service restaurants	0	3	8	11
Employment services	0	7	2	9
Services to buildings	0	6	2	8
Limited-service restaurants	0	1	7	8
Business support services	0	6	1	7

Table 11. Top 10 Sectors by Output

Description	Direct	Indirect	Induced	Total
Wholesale - Grocery and related product wholesalers	$37,807,499	$1,410,438	$127,978	$39,345,916
All other food manufacturing	$19,250,000	$5,089	$665	$19,255,753
Construction of new commercial structures, including farm structures	$16,840,960	$0	$0	$16,840,960
Management of companies and enterprises	$178,376	$3,551,459	$324,449	$3,875,908
Other real estate	$6,320	$2,329,003	$870,137	$3,205,460
Owner-occupied dwellings	$0	$0	$2,583,217	$2,583,217
Insurance carriers, except direct life	$1	$612,170	$737,947	$1,350,118
Monetary authorities and depository credit intermediation	$0	$739,609	$534,518	$1,274,127
Offices of physicians	$0	$0	$1,036,297	$1,036,297
Employment services	$0	$791,004	$213,799	$1,004,803

Funding Proposals Support Documents

Madison Terminal Market Grocery Locker Pilot Business Concept

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Contents

The Pilot Program

The pilot will be a three-year initiative that tests the use of shared-used grocery lockers at three to five different sites across the city. The pilot also includes the development of a reservation tool, which is a third-party API or web application that integrates with grocers and farms looking to drop off product at these lockers. Finally, this program includes training to ensure that the suppliers and couriers use the systems properly. The pilot will be overseen by the local committee and will be operated by a third-party selected through a request for proposal (RFP).

Goals

The goals of the pilot include:

1. Efficiency gains for last-mile or quasi last-mile delivery
2. Competitiveness for local small business
3. Access to fresh and nutritious foods
4. Access for food insecure populations
5. Understanding consumers and technology

These goals will be assessed periodically against the following benchmarks.

Goals	Outcomes	Evaluation Tools
Efficiency gains for last-mile or quasi last-mile delivery	• Reduced delivery costs	• Interviews with participating retailers and farms before and after pilot
Competitiveness for local small business	• Increased e-grocery sales • Improved sales for CSAs and farmers markets • Increased participation from local food and farm businesses • Improved coordination between vendors and couriers on fulfillment and delivery logistics	• Interviews with participating retailers, farmers, and couriers before and after pilot • Tracking the number of vendors using the system • Tracking sales and locker reservations over time
Access to fresh and nutritious foods	• Increased access to fresh food for longer periods while maintaining product quality and food safety	• Consumer satisfaction surveys • Tracking locker turnover • Trends in locker utilization
Access for food insecure populations	• Increased deliveries of fresh food in low-income communities • Increased access to food pantry after operating hours	• Paper and online surveys through food access partners

Understanding consumers and technology	• Increased understanding of consumer preferences • Improved understanding of using and maintaining locker systems and reservation tool • Increased use of e-commerce technology	• Paper and online surveys • Feedback from trainings with retailers, farmers, couriers, and property managers

Questions to Answer

The design of the pilot is intended to answer the following questions:

- Who are the likely vendors?
- What locker configurations work best?
- What level of training is needed for grocers and couriers?
- When do people like to pick up their orders?
- Where do people like to pick up their orders?
- Is pickup usage different across communities with different demographic, economic, and psychographic characteristics?
- What is the best way to integrate with a retailer's e-commerce platform?

The pilot also needs to find solutions to various operational challenges that may occur. The key issues involve customer, retailer, and system failures. These include failure of customers pick up on-time, system power outages or refrigeration problems, or failure of retailers and couriers to deliver on time. An important aspect of the pilot will be to determine the proper standard operating procedures to address each concern.

To answer these questions, the pilot program will test locker systems at various locations that cover different demographic and economic characteristics. Depending on the number of pilot locations, there may be an opportunity to test different locker configurations as well.

Locations

The pilot will be hosted at three to five locations across the city. The grocery lockers will be placed inside multi-family residential complexes, office buildings, and community centers. The following locations were selected for further consideration based on the following criteria:

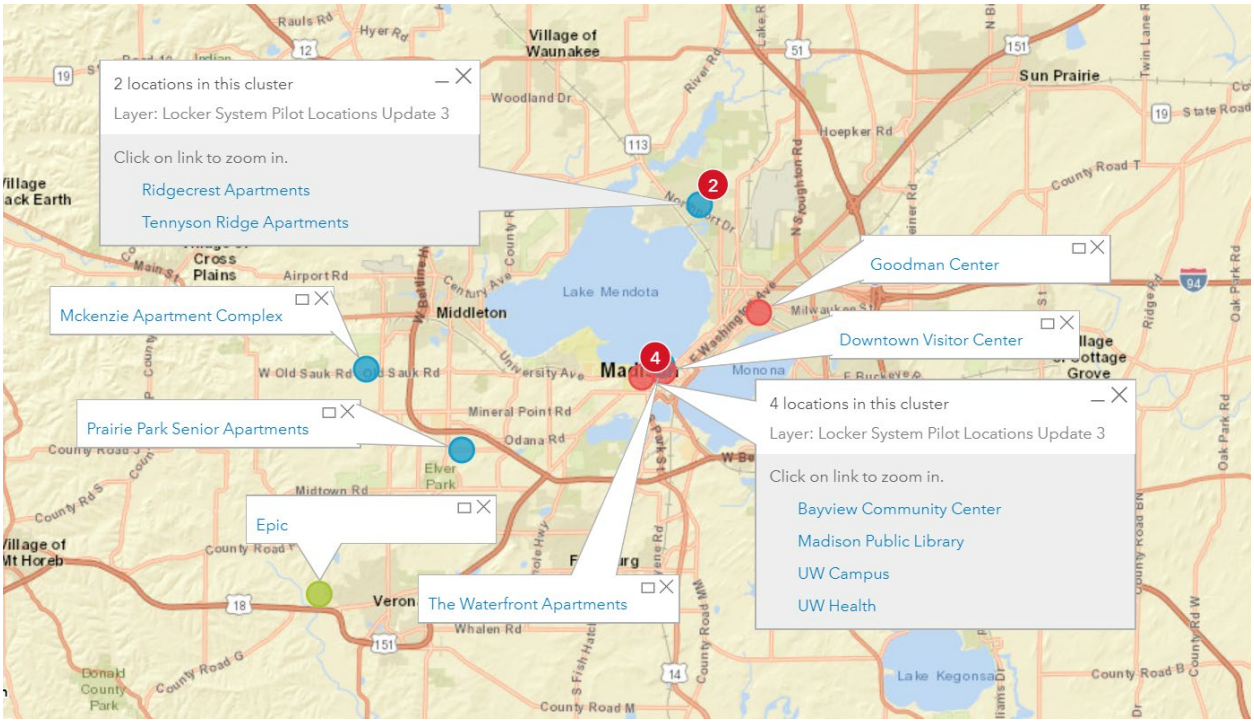
- Various income levels and demographic fits
- Public accessibility
- Near work and living
- Close to public transportation
- High foot traffic

Currently, the Goodman Center and the Bayview Community Center have indicated interest and excitement for the pilot. The Goodman Center has ample space for three locker towers or 24 locker positions. The Bayview Community Center has limited interior space for lockers and may wish to pilot both open access lockers as well as attended lockers. Attended lockers may be used to support communities with disabilities, language barriers, or low technology adoption rates.

OTHER RECOMMENDED SITES

- EPIC: Although it is located outside Madison, EPIC would be a good place to develop best practices for using grocery lockers on a corporate site.
- Waterfront Apartments: Management at a luxury apartment complex may be interested in offering grocery lockers as an amenity. The psychographic and demographic characteristics of these residents favor the use of e-grocery and home delivery.
- UW Health: Provides a nexus for addressing food access and nutrition. It could be an ideal place to integrate CSAs, farmers' markets, and food pantries.
- UW Campus: Students not on a meal plan may be interested in participating in grocery delivery. Student groups are also interested in using these systems to address food access on campus.

Possible locations are noted in the map and table below.



Location	Address	Type
Ridgecrest Apartments	517 Northport Dr, Madison, WI 53704	Residential
Tennyson Ridge Apartments	3834 Tennyson Ln, Madison, WI 53704	Residential
McKenzie Apartment Complex	9201 Waterside St, Middleton, WI 53562	Residential
The Waterfront Apartments	633 N Henry St, Madison, WI 53703	Residential
Prairie Park Senior Apartments	6530 Schroeder Rd, Madison, WI 53711	Residential
Epic	1979 Milky Way, Verona, WI 53593	Commercial
UW Health	600 Highland Ave, Madison, WI 53792	Public Facility
Downtown Visitor Center	452 State St, Madison, WI 53703	Public Facility
UW Campus	800 Langdon St, Madison, WI 53706	Public Facility
Madison Public Library	201 W. Mifflin St. Madison, WI 53703	Public Facility

Goodman Center	149 Waubesa St, Madison, WI 53704	Public Facility
Bayview Community Center	601 Bayview, Madison, WI 53715	Public Facility

Phasing

The pilot is divided into four phases. Phase 1 involves planning and development to stage the implementation. Phase 2 is the first stage of operating the pilot. It tests the management and operations of a simplified locker system and web application design. At the end of Phase 2, the project team and stakeholders will evaluate key performance metrics, operating procedures, and customer feedback. This information will help refine the pilot design and be implemented in Phase 3, which will implement the refinements and allow for more complexity. Phase 4 concludes the pilot. At this point, the project team will determine whether or not to continue the project.

Phase 1 - Planning and Development

For Phase 1, a coordinating entity will need to be identified to lead the planning and development efforts. This entity will finalize and oversee the work plan. Accomplishing this work will require upfront funding to support the planning, research, and fundraising activities. Identifying a local philanthropic organization would be helpful. In addition, the project team should work to obtain support letters and matching funds. These are required for the federal grants.

During Phase 1, the project team will finalize the operating details. This includes site selection, technical specifications, locker configurations, operating protocols, standard operating procedures (SOPs), evaluation tools, lease terms, and legal documents. These details will need to be approved by the coordinating entity, planning committee, and an attorney. Once confirmed, separate RFPs will be developed to determine the manufacturer of the locker systems, operator of the pilot, and developer for the web application. All of this information will then be compiled into a finalized budget.

Once funding is secured and contracts are approved, the project team will develop pre-launch marketing materials and the web application. While there will be a general marketing strategy, each location will have tailored marketing since each site represents different demographics, cultures, needs, and preferences. The web application will also be tested with participating grocers and farms. Additionally, the project team will work to provide print and digital marketing materials that these partners can use.

After approving the marketing materials and successfully testing the web application, the project team will procure the locker systems, additional construction, power needs, internet and data plans, web hosting, cloud service, and other materials or services.

Tasks	Timeline to Completion
Finalize work plan • **Identify coordinating entity or organization** • **Determine who is responsible for each task** • **Finalize timeline**	1 month after project initiation
Identify partners and funders • **Obtain funds for phase 1 tasks** • **Obtain support letters** • **Determine matching funds**	1 month after project initiation

Finalize operating details • **Site selection** • **Wireframe and specifications for locker reservation application** • **Operating protocols, SOPs, evaluation tools** • **Lease agreements, legal forms, terms of service, etc.** • **Hire attorney to review lease agreements and legal forms** • **Develop and release RFPs (locker systems, operator, and web application)** • **Finalize pilot budget**	3 months after project initiation
Prepare and submit grant applications • **USDA LFPP Grants (~Jun. 2020)** • **USDA Farm to School Grants (~Dec. 2020)** • **USDA Rural Development Grants (rolling applications)** • **US EDA Grants (TBD)** • **Foundation**	5 months after project initiation
Develop pre-launch marketing	6 months after project initiation
Develop and test web application	11 months after project initiation
Procurement and installation	12 months after project initiation

Phase 2 - Stage 1 Operations Testing

During Phase 2, the pilot will test lockers configured only with refrigerated towers to simplify operations and software development. Using only one tower type will simplify both the coding requirements during the first stage of the project as well as the operations. Keeping lockers between 35 and 38 degrees provides a satisfactory temperature range for a broad line of products. Depending on the allotted storage window, certain frozen products, and even fresh-baked products may be offered, if retailers use insulated grocery bags.

This phase will begin with an aggressive marketing campaign in collaboration with partners at the retail, CSA, corporate, public health, food access, and community levels. The purpose of this marketing campaign will be to direct consumers to register as users in the locker system. Registration is a necessary step for customers to be eligible for locker delivery.

During this phase, the technology backbone of the locker system will be run by the local partner selected in Phase 1. The operating partner will manage and maintain the locker scheduling software used to schedule deliveries and push notifications to retailers, consumers, and related third parties as well as supplying associated logistics support. The operator will provide training to suppliers and couriers where necessary. The operating partner will also manage customer relations and data collection platforms with monthly reporting to the Terminal Market Local Team. Finally, the local operator will provide or dispatch service technicians to keep the locker system operational and compliant with food safety standards.

Grocers, CSAs, food access programs, and others that offer delivery to the locker system will be solely responsible for managing their own orders, transaction fulfillment, logistics, customer relations, and

customer communications regarding the order contents. The lockers will be made available to the customers of these suppliers on a first-come-first-serve basis. Every time a locker is used, the supplier is charged a per-use fee.

When customers place orders online, a reservation tool will be embedded in the e-commerce platform or be made available as a redirect. Customers can select the locker site and reserve the following delivery time slots on each day of the week:

- 9 AM to 12 PM
- 12 PM to 3 PM
- 3 PM to 6 PM
- 6 PM to 9 PM

These times may be adjusted depending on the operating hours of the pilot location. Also, customers are encouraged to pick up as early as possible and are notified through text or email.

During this phase, numerous operating schemes will be tested. Among the most important elements to be tested include:

- Operating procedures for reservations and pick-up
- Third-party locker management
- Time of day operations
- Technology integration
- Cultural adaptation
- Efficacy of staffed versus unstaffed operations
- Messaging effectiveness

In addition, each of the selected locations will be encouraged to co-develop operating and marketing models adapted to the specific community conditions. To the extent that each site adopts a varied approach to marketing and operations, the evaluating tools previously suggested may need to be altered or amended.

Phase 2 will conclude with a survey of all stakeholders to assess the success of the project through the first nine months. Lessons learned will motivate suggestions for amendments and redesign of Phase 3.

Phase 3 - Stage 2 Operations Testing

During phase 3, the pilot will add complexity incrementally with configurations that allow multiple temperature zones and may include an integrated transaction system to support small users that do not currently have online ordering platforms. The addition of “fresh” lockers means the ability to allow pickup of dry goods, floral products, baked goods, and fresh produce items that do not require high levels of refrigeration. Adding to the diversity of locker types may require significant coding to support the necessary backend and consumer-facing platforms to accommodate the added complexity.

Phase 3 will also see the introduction of several additional innovations. First will be the introduction of reusable packaging to include reusable, folding polymer containers and insulated, reusable bags. The second innovation will be a food collection portal to accept food donations at particular locations. Finally, this phase will use technology to facilitate and encourage the development of coordinate deliveries to minimize the number of vehicles servicing the lockers, which may mean identifying and sharing a logistics partner or even sharing a distribution center.

At the conclusion of Phase 3, an analysis of performance data from two years of operations will be undertaken. The analysis will be based on internally generated data as well as data collected through interviews and surveys with program stakeholders. The performance assessment will follow the outline provided in the first section of the memorandum. The results of the analysis will be used to motivate the decision to fully commission or decommission the locker program.

Phase 4 - Commissioning or Decommissioning

At the conclusion of the pilot, the local team will make the decision to continue or terminate the program. If the program has met or exceeded its target goals, the local team must determine if the project will be continued as a publicly supported program or be divested to a private operator. If the program has failed to meet its goals, the local team will decommission the program and divest itself of the program's assets.

The Technology

Refrigerated Lockers

Refrigerated lockers are modular multi-temperature locker units that store delivered groceries at a safe temperature while awaiting customer pick up. Depending on the manufacturer, each locker tower or individual locker within the unit is temperature-controlled independently to ensure that perishables remain fresh and that products like produce, meat, seafood, and dairy are maintained at proper temperatures. There is also the option to add locker units that do not need any refrigeration, which allows for non-perishable grocery items.

Delivery and pickup are simple. The retail grocers or couriers will receive an access code to deliver to an appropriate locker at the customer's chosen location. Customers pick up their orders by unlocking the locker at a touchscreen interface using their smartphone's NFC capability, a QR code, a pin, or a swipe card. PINs and QR codes are the commonly-used options. This information can be relayed through apps, notifications, email, and text messages.

Considerations:

1. The outdoor lockers operate between -4°F and 148°F. That means operating an outdoor system year-round is not possible in Madison. However, it may be useful as a seasonal deployment option for CSA and farmers market pickups.
2. The lockers require access to power and the Internet. It may be necessary to require a facility to have backup power generation.

Utilities and Internet

The locker systems require power and run on one dedicated 110V (220 watts) outlet per tower. They also require connection to the internet through Wi-Fi or an ethernet connection. If neither is available, a cellular product will need to be purchased for each site that requires one.

Annual energy use for a 13-door controller and three temperature-controlled towers running year-round is about 10,775 kWh. That is about $1,382 to cover the City's distribution and electric charge.

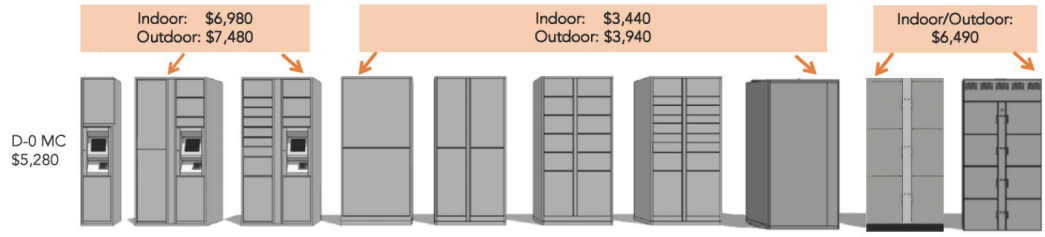
Table 12. Energy Use Calculation

Energy Use		
D13 Controller (kwh per year)	30	263

Fridge (kwh per year)	410	10,775
Distribution service: All kWh, per kWh	$0.02	$253
Electricity charge: All kWh, per kWh	$0.10	$1,128
Energy Cost		**$1,382**

Configurations

Every pilot location will require at least one controller and one locker tower. Locker towers come in three configurations. There are five different ambient units and two cold storage units (fresh and frozen/refrigerated).



	Control	6 doors	13 doors	2 doors	4 doors	12 doors	18 doors	1 door	Fresh	Frozen/ Refrigerated
Small	X	1	7				12			
Medium	X	2	4			10	4			8
Large	X	1	2			2	2		6	
Extra-large	X	2			4					
Oversize	X			2				1		

The pilot will budget for Config 1 or Config 2 (see table 2). However, having multiple temperature zones is complex. Thus, the pilot will test the configurations across two phases. Phase 2 will focus on testing Config 3. Phase 3 would involve testing either Config 1 or Config 2 on multiple sites.

Table 13. Configuration and Costs

	Cost	Config 1	Config 2	Config 3
Controller (base; indoor only)	$5,280			1
Controller (6-door; indoor)	$6,980			
Controller (13-door; indoor)	$6,980	1	1	
Fresh (6-door; indoor)	$6,490	2	1	
Frozen/Refrigerated (8-door; indoor)	$6,490	1	2	3
Shipping per tower	$600	$2,400	$2,400	$2,400
Installation per tower	$600	$2,400	$2,400	$2,400
Locker Cost per Location		**$31,250**	**$31,250**	**$29,550**

Reservation Application

For the locker systems to work with multiple users, a tool is required to enable customer reservations for time slots for pickup. This reservation tool is an API or web application that integrates with e-commerce platforms, manages the lockers, and performs analytics. Since the locker systems are agnostic towards who delivers, access to the lockers is on a first-come-first-serve basis. Thus, the application is required so that users know which lockers are available at different time periods.

The application also must be flexible enough to easily integrate with a retail grocer's or farm's e-commerce platform. It is recommended that a locker reservation platform be developed and integrated through a simple redirect that can be easily included on any website.

This platform would allow the customer to choose their preferred pickup location, day, and time slot. On the backend, the application determines availability based on what is already in the lockers, existing reservations, and types of lockers available at each location. Customers would also have to register to use this service. In addition, residential and corporate locations could be restricted to the people who live or work there. A special registration code would be used to verify these users.

Finally, the platform should ask the customer for feedback on preferred locations and user experience after picking up their order. The application should also keep track of people's preferred pickup times and product mix to help determine which locations need more locker units or be configured differently.

Development of this application will require creating a wireframe and hiring a web/software developer.

Operator

An operator will need to be identified to oversee the training, maintenance, and coordination functions of the pilot program. An RFP should be written to solicit applicants.

Ownership

During the pilot phase, the lockers will be purchased and owned by the City of Madison. The City will create a memorandum of understanding (MOU) with the operator and each of the pilot locations, in which the property managers or organizations agree to host the lockers. The MOU will outline the roles of each party and responsibilities as it pertains to maintenance, food safety, risk, and insurance.

At the end of the pilot, an evaluation will determine the viability of these locker systems. If viable, the lockers can be sold to the identified operator or to property management. If the stakeholders are not interested in purchasing the systems, the City will attempt to resell to other interested buyers. Once sold, the new owners will assume all responsibility and risk associated with operating these lockers.

Fulfillment & Delivery

Fulfillment and delivery are the responsibility of the retail grocer, farm, or food access provider. These sellers or suppliers may find it advantageous to partner together and share logistics.

During Phase 2, there will be restrictions on the types of products that can be delivered to a locker system. Products not allowed could include pharmaceuticals, frozen foods, and dry goods. However, certain frozen products and even fresh-baked products may be offered, if insulated grocery bags are used. During Phase 3, more temperature zones will be made available to accommodate more products. Nonetheless, pharmaceuticals should not be allowed.

The operator will provide training to suppliers and couriers to ensure that only the appropriate products are eligible for this service and that insulated grocery bags are used for items with exceptions. During Phase 3, the operator will work to ensure products are packed separately if they need to be placed in multiple lockers for temperature control purposes. For instance, a customer may place one order that includes dry goods, fresh produce, and dairy products. Depending on the quantity and mix of products, they may need to be placed in different lockers.

	Standard Locker	Fresh Locker	Refrigerated Locker
Temperature	Ambient	60°F to 70°F	35°F to 46°F
Products	Dry goods Shelf-stable foods Non-perishables Non-frozen baked goods	Fresh produce	Dairy Eggs Meats and seafood Some produce

Risk Management

Risk management of the locker systems is focused on ensuring food safety, maintaining equipment, and preventing theft. Product loss, product quality, and spoilage are among the largest concerns from the points of customer satisfaction and product quality. Since the lockers will be located on the properties with high volumes of public traffic, personal injury coverage will need to be evaluated by a loss control professional in order to properly insure against the risk. Depending on the level of consumer data maintained by the locker system operator, Cyber coverage levels should also be reviewed.

If Phase 3 is to incorporate a shared transaction system, Payment Card Industry Data Security Standards (PCI) must be met. PCI compliance and proper Cyber coverage will be required and may add significant cost to insurance coverage.

Food Safety

Food safety is paramount to prevent foodborne illnesses and maintain the highest quality product. Training will be provided to suppliers and couriers to ensure the following:

1. Couriers are placing food in the appropriate locker(s) based on temperature needs.
2. All suppliers have a food safety plan and are actively maintaining records.
3. All employees involved in handling food maintain proper hygiene.

The operator will also monitor the locker systems to ensure that temperatures are maintained and that no product is held in a locker for too long. Notification tools will be used to encourage timely pickups. Lastly, the operator will also have access to the locker systems to conduct maintenance.

Food safety liability falls upon the suppliers and couriers until product is securely placed into a locker unit. The operator is only liable once product is placed within the system, with two exceptions. First, the courier assumes liability for misplacing product. Second, if customers do not retrieve their order within 24 hours, the operator is relieved of liability.

When customers decide to use this service, they will have to agree to the terms and conditions, which address liability. The operator will work with the organizing committee to develop a standard Terms of Service that must be accepted by any user of the locker system; this will be reviewed by a qualified legal counsel or attorney. At a minimum, the terms of service are likely to include the following elements:

Locker System Terms of Service – Basic Elements

Modification of terms	Grant of license to use
License of use	Limits to rights of use
Requirement to establish an account	No distribution of controlled substances
Registration policy	Limited access
Privacy policy	Orders not picked up
Right to collect information	Disclaimer of availability
Use of information	Changes and cancellations
Use of private information for research purposes	Unfulfilled and partially filled orders
Limits to sales or transfer of personal information	Third-party service notice
Limits of liability	“As is” and “As available” use
Indemnification	Termination of access
Arbitration	Third-party software notice
Monitoring and enforcement	Site security
Account termination	Food safety waiver
Responsibility for use of account	Service pricing, fees, and other changes,
Communications policy	Wisconsin law applies

Additional terms may apply based on the requirements of retail, farm, and distribution partners.

Maintenance

The refrigerated lockers will need to be inspected and maintained. Such inspections include everyday maintenance such as wiping down the lockers for dust, confirming no furniture is bumping into the system and denting the metal, inspecting for damage or faulty locker units, and ensuring that food is not misplaced.

The operating team will report hardware or physical damage to the lockers to the account manager, assigned by the locker system manufacturer, for repair. Software maintenance is performed or pushed out remotely from the manufacturer’s development team.

Insurance

Part of risk management is being properly insured. The operator will be expected to have or purchase commercial property insurance as well as general liability insurance with a $1 million / $2 million policy. The retail grocers, farms, farmers' markets, and other food access providers will be expected to have their own insurance policies as well.

Safety and Theft

Every locker tower comes with a security camera, which acts as a deterrent for theft. A camera in the locker units also records who is picking up the order. These video records can be accessed when investigating theft or safety concerns.

Management of safety and theft prevention will vary depending on the location of the locker. During the pilot, all lockers will be placed indoors. As a result, access to these lockers will depend on the hours of operation for the location. Access to these buildings will be the responsibility of the property management.

In general, residential properties such as multi-tenant apartment complexes have private access that is unavailable to the general public. Commercial properties may either offer private or public access,

depending on the business or organization. Public spaces such as community centers and libraries offer access to the general public.

Marketing and Promotion

The operator will have to create a mix of print and digital media such as flyers, social media posts, and web content that can be shared among those involved in the pilot. This promotional material will be designed to inform customers about the service, help them use the reservation platform, and encourage them to try it out.

There is an option to purchase custom wraps to enhance the locker towers. The wraps can be used to display advertisements or branding. To provide such augmentation, Parcel Pending charges $2,500 for the first five towers and $200 for each additional locker. Alternatively, the community can be invited to create a mural for the lockers.

Budget

The following table estimates the costs of piloting this concept. The costs will vary depending on how many sites are selected. This budget will also be modified during the planning and development phase.

Startup/Capital Costs	**3 Sites**	**4 Sites**	**5 Sites**
Planning and Development	$80,000	$80,000	$80,000
Legal Services	$15,000	$15,000	$15,000
Marketing	$5,000	$5,000	$5,000
Locker System[30]	$93,750	$125,000	$156,250
Application & API Development	$110,000	$110,000	$110,000
Total Startup/Capital Costs	**$303,750**	**$335,000**	**$366,250**
Operating Costs			
Cloud Server[31]	$7,200	$7,200	$7,200
Tech Support[32]	$2,400	$2,400	$2,400
Liability Insurance[33]	$2,500	$2,500	$2,500
Management Staff[34]	$40,000	$40,000	$40,000
Software Fee[35]	$4,320	$5,760	$7,200
Maintenance[36]	$4,688	$6,250	$7,813
Energy Cost[37]	$4,145	$5,527	$6,909
Total Operating Costs	**$65,253**	**$69,637**	**$74,021**
Total Cost	**$369,003**	**$404,637**	**$440,271**
Cost per day	**$179**	**$191**	**$203**
Cost per locker position per day	**$2.48**	**$1.99**	**$1.69**

Funding

Funding for this pilot can come from a variety of sources. The USDA Local Food Promotion Program (LFPP) grant, USDA Farm to School Grant, USDA Rural Development Grants, US EDA Grants, and SEED Grants are several funding sources that can help with paying for capital, development, and personnel costs. The LFPP implementation grant awards between $100,000 and $500,000 in funding with a 25% match. The Farm to School implementation grants awards between $50,000 and $100,000 with a 25% match.

[30] The locker system costs are based on Config 3 in table 2.
[31] The cloud server will hold the database and application. The budget allocated $600 a month but will likely be less to begin with.
[32] Once the web application or API is created, it will require off-site technical support and monthly maintenance.
[33] Insurance is based on a $1M/$2M policy.
[34] Part-time staff to manage and oversee the pilot program and reservation tool.
[35] The software fee is around $120 per month per site.
[36] Maintenance is 5% of the total locker cost.
[37] Energy costs are based on the calculations in table 1.

In addition, the identified operator can charge a pay per use fee to retailers, farms, or organizations. Based on the cost per locker position per day, the fee can be anywhere between $1 to $2. The following table demonstrates the breakeven number of transactions and households needed to breakeven on operating costs if a $2 per use fee is charged. A $1 per use fee would double the breakeven results.

	3 Sites	4 Sites	5 Sites
Per Use Fee	$2.00	$2.00	$2.00
Breakeven Transactions	32,626	34,819	37,011
Breakeven Transactions per Site	10,875	8,705	7,402
Transactions per household per year	26	26	26
Est number of households per site	418	335	285

Forward funding of the project may be necessary to keep the project on track for a summer 2020 launch.

Next Steps

ACDS suggests moving forward with the full pilot project. The next phase will be the creation of a business plan for the pilot program to include:

- Identification of sites and partner organizations
- Assessment of site development requirements
- Creation of partnership agreements
- Recommended site use agreements
- Creation of RFP's for operator, locker systems, and legal services
- Creation of milestones and deliverables
- Development of phased operating budget
- Creation of fundraising plan
- Development of monitoring and evaluation plan
- Identification of risk management issues

Covid-19 Response for a Resilient Food Supply Chain in Dane County

A "Pop-up" Terminal Market

Leadership Team

- CivAmi Ag
- MadREP
- ACDS, LLC
- City of Madison
- UW CIAS
- UW Extension
- NPC/FEED Kitchen

Budget

$5 million:

- Building and maintenance
- Outfit terminal market
- Personnel
- Technology platform
- Producer business services
- Permanent market preparation

Components

- ~60,000 ft^2 warehouse
- Refrigerated and dry storage
- Pick and pull space

Timeline

Operations begin within one month of funding.

Growth Planning

- 150,000 ft^2 facility
- Ongoing technology platform improvement

Need

- The Covid-19 crisis has amplified pre-existing weaknesses in the food system.
- Farmers need more flexible options to market their products to Dane County residents, especially serving emergency food relief organizations.
- Solutions that link farmers to new market opportunities must begin operations as soon as possible.

Solution

The Wisconsin Terminal Market is a staging facility to facilitate food storage, repackaging, and order aggregation, with the objective of facilitating greater volume of local sourcing of food from small and medium producers.

The Market will address critical physical and market information gaps in the food system with three primary objectives of particular urgency during the pandemic:

1. Improve ability for emergency food providers and those with disrupted supply chains to source, store, and distribute products locally.
2. Enable farmers to access alternate markets and distribution options.
3. Facilitate commercial interactions between food system businesses to utilize assets more fully, through the physical market as well as a digital platform.

The market can immediately occupy existing permitted space in Sun Prairie and begin operations.

Short Term Users

- Small and medium food producers for order aggregation and storage, enabling last-mile distribution to institutions and individuals.
- Institutional, non-profit, and government food buyers needing to adjust and expand supply chains due to Covid-19 disruption.

Background and Vision

Over the last 8 months, the City of Madison has engaged in a Terminal Market planning process, resulting in civil society consensus around and detailed market justification for the project.

Covid-19 has impacted developing the physical assets envisioned, while also leaving relevant actors prepared to swiftly implement a smaller-scale "pop-up" solution with a robust digital platform. The Terminal Market is imperative for emergency response in the short-term and may serve as proof-of-concept for a new farmer-driven distribution model while a permanent facility is under development.

The shared Wisconsin Terminal Market Vision is to make sustainable, local food production viable at scale, with positive outcomes for businesses, consumers, and the agricultural sector, while defining Wisconsin as the national hub for food system and agricultural innovation.

Proposal: Regional Aggregation and Processing for Intermediary Distribution

Submitted to the Wisconsin Department of Agriculture, Trade, and Consumer Protection

1. Project Summary – 500 characters

The Northside Planning Council will partner with local and regional food system stakeholders to develop an integrated system of contactless delivery of emergency food alongside flexible warehousing and logistics solutions. Funding will support the physical development of 20,000 ft^2 of shared-use cold storage, packing, and logistics infrastructure. It will also support e-commerce integration, logistics coordination, and shared-use refrigerated delivery lockers for use by food insecure residents.

2. Detailed Project Purpose – no character limit

Problem Summary

The COVID-19 crisis has amplified pre-existing weaknesses in the food system. Across Wisconsin residents and communities, already vulnerable to food insecurity, are facing even greater challenges in the face of the outbreak. Now, families face job loss and greater grocery shopping risks. Food supply chains experience supply disruptions and price gouging. Emergency food organizations, such as pantries, schools, and meal programs, experience shortages in volunteers and critical product shortages in basic items such as milk and bread. The magnitude and interrelatedness of these challenges are striking. For example, initial unemployment insurance claims in Wisconsin were nearly twenty times higher the last week of March and the first week of April 2020 than they were for the same weeks in 2019 (WI Department of Workforce Development, 2020), and these losses have been sustained for several months. A recent survey conducted by Hunger Free America shows the stark impact of this economic strain on households. For example, "over the past month, 37% of parents nationwide cut the size of meals or skipped meals for their children because they didn't have enough money for food" (Bartfeld, 2020).

Experts have noted that "the parts of the food system that will suffer the worst disruptions [resulting from COVID-19] are the ones dependent on heavily consolidated supply chains" (Corkery & Yaffe-Bellany, 2020). This observation reinforces research that has found that resilient food systems are characterized by organizational and supply chain diversity and redundancy (Lengnick, Miller, & Marten, 2015). However, in southern Wisconsin, a widespread lack of short-term refrigerated warehousing and staging facilities makes it difficult for small and medium-sized farms, independent food businesses, and emergency food providers to efficiently store, repack, and distribute perishable products even when supply and demand are strong. As a result, farmers with oversupply conditions are not able find a home for their products even when store and food pantry shelves are bare.

Over the past month, the loss of restaurant accounts, restrictions on public gatherings, and a growing emphasis on "no contact" transactions have introduced new challenges to supply chains. Significant changes to marketing and distribution channels have forced farms, food businesses, and emergency food providers to quickly retool to access customers and meet community food needs safely. Until now, "no contact" transactions and deliveries have been

popular only within certain demographic groups, generally urban shoppers with high disposable income. With the risks of COVID-19 falling disproportionally on the elderly, infirm, and people of color, expanding "no contact" transactions and delivery has become a costly imperative with NPC and other emergency food providers, as they rapidly expanded home delivery options over the last several months. Finding more efficient ways to provide shared-use, partner-based, "no contact" transactions and deliveries to all communities across the state is now a common goal of many emergency food providers and small retailers.

With a second spike in COVID-19 cases expected this fall and social distancing measures continuing, the need for emergency food services and support for small farms and food businesses is expected to grow. Yet, food bank and pantry facilities are reaching maximum capacity, and social distancing directives increase operating costs for all types of food entities. These costs are driven by the need for repacking efforts to find new warehousing space that allows for the six- foot distancing provision or to reduce their workforce and thus capacity. Before the COVID-19 outbreak, there was an insufficient supply of affordable, available refrigerated storage space in south central Wisconsin and many other areas of the state, especially for independent food businesses (farmers, small processors, restaurants, and retailers). Now, this scarcity has only worsened as the need for refrigerated storage increases due to a surge in demand by grocery retailers, food banks, and others. Diminished volunteerism also intensifies the need to professionalize the procurement, packing, and distribution of food has risen as well.

As a result of increased demand for emergency food and reductions in the frequency of household grocery shopping trips, a considerable influx of food into the emergency food pipeline and independent groceries is needed. Early discussions with Wisconsin Farm Bureau, Wisconsin Farmers Union and Professional Dairy Producers of Wisconsin indicate that they intend to bring dairy surplus to emergency food operations, in cooperation with USDA. Much of this product requires refrigeration, is packaged for food service customers, and must be repackaged for distribution in smaller units. Farmers who sell large quantities through farmers' markets, small processors, and restaurants are also facing a loss of markets and need refrigerated warehousing and repacking capabilities for both emergency food use and to supply independent groceries. Now, more than ever, public-private partnerships are necessary to add critical infrastructure to ensure market and food access.

Partnership Response

In response, NPC, in partnership with the many organization supporting this project (see attached letters), are proposing to implement an integrated approach. The plan is to address "no contact" transactions and deliveries as well as the purchasing, aggregation, storage, and logistics challenges facing food banks, particularly in the sourcing of Wisconsin products.

The first element of the project is called the Community Food Locker Project. These refrigerated lockers will be deployed in communities with the highest need and be managed as shared-use assets across the public and private sector. This project will be the first time any

such effort has been attempted in the US. Such refrigerated lockers have thus far been used solely by retailers, like Whole Foods, for the exclusive use of their customers.

NPC is also proposing to standup the community food hub and regional aggregation center portion of the proposed Wisconsin Terminal Market in Madison. This cold storage and food staging facility will serve as the first phase of the terminal market development project and serve as a hub for purchasing, packing, and delivering a variety of local, perishable products. The intent of this facility is to serve vulnerable populations, prop up sagging independent and regional food supply chains, support Wisconsin farmers, and offer a model for other communities around the state.

Combined, these elements will provide a strategic, flexible, and integrated approach to addressing gaps in regional food infrastructure and logistics that (1) responds to immediate food supply chain and access issues resulting from the COVID-19 pandemic and (2) addresses systemic issues that contribute to vulnerabilities in the regional food system and make it difficult for Wisconsin's small and medium farms to make ends meet. As such, the proposed activities are consistent with the goals of this RFP, the Wisconsin Farm Support Program, the Wisconsin Partnership Program's 5-Year Plan, and the City of Madison's 2019 Terminal Market Feasibility Study. It includes catalyzing systems changes to increase health and well-being by strengthening the regional food system and piloting an innovative solution to gaps in regional food infrastructure.

Brief descriptions of these operations follow.

Community Food Locker Project

The NPC—in collaboration with the Madison Region Economic Partnership, the City of Madison; UW - Madison Division of Extension, the Dane County Farmers' Market, local grocers, and Second Harvest—has designed an initiative to test the use of refrigerated shared-use food lockers for grocery and CSA pickup at multiple locations in metro Madison. This project is a direct result of the city's 2019 Terminal Market Feasibility Study and is spurred by the need to help the region's direct-market growers and emergency food providers reduce last-mile delivery expenses and increase access to fresh, locally sourced foods, especially in low food access areas.

Community food lockers are expected to serve as an effective last-mile or shared last-mile solution for grocery and food delivery to overcome given various traffic, delivery costs, and food safety concerns. Locker operations are straight forward. Locker units store food for customers in a food-safe environment for pick up at their convenience. They are temperature-controlled to ensure that perishables remain fresh and products like produce, meat, seafood, and dairy are maintained at proper temperatures. Customers pick up their orders by unlocking the locker through a pin or contactless method (QR Code, barcode).

Lockers will be "agnostic" as it relates to the user. Typically, locker banks are proprietary and controlled by a single retailer. However, the agnostic concept means that more than one

supplier (e.g. farmer, grocer, emergency food provider) can deliver to the lockers, and customers using the lockers can shop from multiple suppliers. This helps ensure market access via the locker model for emergency food suppliers, farms and small food retailers that could not otherwise afford to offer “no contact” delivery.

These lockers will also be located at various convenient public and residential locations. Special attention will be paid to locate lockers within low food access communities. When strategically placed, they can help save distribution costs, which are especially beneficial for those serving metropolitan areas like Madison with its unique traffic challenges as well as rural community centers that are far from retail grocery. The lockers enable emergency food providers, local farmers, and grocers to make multiple deliveries to a single site, thus reducing distribution costs. Customers can purchase fresh and frozen products from a variety of local vendors and retrieve them at their convenience.

While the need for the project predated the COVID-19 epidemic, the proposed model is well-suited to address issues the pandemic has amplified, including increased demand for online purchasing and no-contact delivery options, increased household food insecurity, and major disruptions to national food supply chains. This project will also include shared e-commerce integration, logistics coordination, and locker installation that will be managed by NPC for the benefit of itself and listed project partners as well as farmers, small food retailers, and others who may not have been identified in time for this submittal.

Integration with the community food hub and regional aggregation center will allow additional cost savings and efficiencies. These savings include the use of a single drop off point for deliveries, shared staffing for packing, and shared last mile delivery using the Hub’s transportation services. For example, the use of the Morgan HD truck body will allow one driver to service 15 times the number of households in a day compared to current delivery methods such as volunteer drivers. Cost saving from these operations are covered in the following section.

With support from DATCP, NPC believes that the costs of delivering emergency and supplemental food supplies can be reduced by as much as 50%. By professionalizing delivery and moving away from volunteer drivers, increases in delivery capacity and food safety are also likely. This will allow NPC and its partner agencies to reach a larger number of households with needed services, many of whom do not have current access to reliable food supplies. The project intends to reach about 10% of the households that live in low-income and low-food access census tracts with approximately 1,480 households per allocated unit.

Wisconsin Community Food Hub and Regional Aggregation Center Project

The COVID-19 crisis has amplified pre-existing weaknesses in the food system from inequities in access to healthy food to concentration and bottlenecks in food supply chains. Farmers and emergency food relief organizations alike need more flexible warehousing and logistics options. Solutions that link local farmers to new markets, including emergency food providers, present

the greatest opportunity for regional producers to replace lost revenues from traditional marketing channels thus helping to preserve farmers' livelihoods while also helping ensure that all of the region's residents have enough to eat.

Specifically, the project will address critical physical and information gaps in the food system with three primary objectives of particular urgency during the pandemic:

1. Improve ability for emergency food providers and those with disrupted supply chains to source, store, and distribute products locally.
2. Enable farmers to quickly access alternate markets and distribution options.
3. Facilitate commercial interactions between food system businesses to better utilize regional assets through improved coordination.

The Wisconsin community food hub and regional aggregation center will be a wholesale staging facility to facilitate affordable short-term cold storage, repackaging, and aggregation. The facility plan calls for 20,000 square feet of freezer, cold, and dry storage with associated packing, repacking, and value-added processing areas. The storage area will be designed for shared use with racking leased by the pallet space. Services, such as packing, re-packing, and shipping will be charged on an ala carte basis. In the short-term, users would include small and medium food producers, non-profit emergency food providers, and government food buyers needing to adjust and expand supply chains due to COVID-19. The intent of the revenue model is to break even on operations.

NPC will use a portion of the facility to expand commissary operations of the FEED Kitchens. The current FEED Kitchens facilities are over capacity providing emergency meals for the underserved, and demand is growing. These commissary operations will be used by the NPC's "Market Ready Vendors" to double production of family food boxes using Wisconsin purchased foods. If the site is large enough to implement appropriate spatial distancing, it could also serve as a business-to-business farmers market, and, at alternating times or days, a pick-up site for drive-up retail farmers' market customers.

Transportation services will be also provided specifically to serve as a regional hub for last mile distribution for expanding CSAs, produce box programs, and other small-midscale, regional food delivery operations. NPC plans to deploy three local delivery trucks. Two vehicles will be Morgan NexGen HD delivery trucks that are specifically designed for home and locker delivery. The third vehicle will be a 26-foot refrigerated truck designed for larger deliveries, supplementing food collection and delivery to and from farmers and retailers in outlying areas.

While imperative for emergency response, the Wisconsin community food hub and regional aggregation center may also serve as proof-of-concept and first phase for a more permanent facility intended to promote regional food system resilience by supporting regional supply chain diversification, improving last-mile distribution efficiencies, and fostering food business ecosystem development. We have already explored regionally available sites and zoning

considerations, and if funded, the pop-up Market could be operational within a month at an existing facility in Sun Prairie that has been preapproved for food distribution.

The original concept for a terminal market predates the COVID-19 pandemic and resulted from a planning process spearheaded by the City of Madison, with county and state partners. At present, the leadership team includes representatives from the City of Madison Mayor's Office and Economic Development Division, UW-Madison Center for Integrated Agricultural Systems, UW-Madison Division of Extension, Madison Region Economic Partnership (MadREP), Northside Planning Council/FEED Kitchens, Agricultural Community Development Services LLC, and CivAmi Ag.

3. Expected Measurable Outcomes

Outcome 1: Increase in the pounds of food, especially healthy and perishable food, served.
This project is aimed at supporting food banks and food pantries by increasing the amount of food served to residents in the MadREP region. In particular, the team is especially focused on increasing consumption of healthy and perishable foods, which has been difficult for many food access providers to address.

Measuring this outcome requires tracking the volume, weight, and types of food that enter the cold storage and packing facility. Volume and weights are either already known through the supplier or are weighed upon delivery to the warehouse. Finally, the team will also track outbound deliveries based on orders. All data will be tracked in an inventory management software.

To track growth and progress, the team will determine a baseline of partner food banks' and food pantries' existing deliveries. Another baseline will be established after one month of operations, to assess internal growth.

Ultimately, this outcome will be achieved through an effective supply chain and distribution model. The supply will be acquired through project partners and farms. These partners will also help with creating awareness among residents to encourage participation. Lastly, a shared-use locker network and delivery trucks will be used to increase the amount of food that is distributed.

Outcome 2: Increase in cold storage capacity and packing efficiency of perishable foods.
Limited cold storage capacity and packing capabilities are significant barriers for food banks and food pantries looking to meet the growing need for perishable foods created by COVID-19. Issues involving limited workforce and reliance on volunteers also strain limited resources and creates inefficiencies.

This project will increase capacity in these areas by outfitting a 20,000 square feet warehouse with cold storage, racking, and material food handling equipment. A workflow will also be developed to make packing both safe and efficient.

This outcome will be achieved when the warehouse facility is successfully outfitted. Meanwhile, packing efficiency will be measured by tracking time spent on storing, handling, packing, and prepacking food. Efficiencies will be improved by documenting the process and implementing changes that increase throughput.

Outcome 3: Expansion of service area and times through shared last-mile delivery.
The project team will work with partner food banks and food pantries to expand service areas by reaching rural or underserved communities via shared last-mile delivery. In other cases, this effort will augment the services provided by increasing the hours that are available for contactless pickup through a network of refrigerated lockers. In either case, the service is expanded through more pickup locations and longer windows of time for pickup.

The team will measure this outcome by tracking the number of new pickup locations and the number of locations that have expanded hours. This data will then be compared against each partner's service area and the collective service area.

To achieve this, the team will work closely with project partners to identify new locations and areas that have limited access. Currently, the team already has several communities identified in Dane County. Other communities will be identified in other counties in the MadREP region. Finally, the team will work closely with the identified sites to arrange logistics and determine operating procedures.

Outcome 4: Increase access to online ordering and other contactless forms of acquiring food. COVID-19 has accelerated the shift towards online shopping and ordering in efforts to minimize contact. Thus, it is critical to improve or provide platforms that allow residents to request for food deliveries. The team also recognizes that some individuals and communities lack internet access. To address this, the project will integrate other contactless methods such as phone, text, and email. Lastly, the use of refrigerated lockers will play an important role in allowing contactless pickup.

A variety of tools will be used to measure this outcome. Once the web platform is created, tools such as Google Analytics will be used to analyze website traffic to assess use over time. If the goal is to increase use of this platform, this data will be important for developing the appropriate user interface that is easy to use and accessible on mobile devices. Ultimately, the team will track the number of transactions that occur through this platform and assess trends. Second, the team will coordinate with project partners to survey or gather feedback on how residents want to communicate and get their food delivered. This information will then guide what contactless methods are needed. Finally, the team will set up the technology to make contactless alternatives available for residents.

Outcome 5: Improve access in communities with limited access to healthy, local food. There are various urban and rural communities in the MadREP region that have low food access. This project will expand access to fresh, healthy, and local food to these communities. Achieving this outcome involves first identifying communities with limited food access. Once identified, the team will determine if food access can be improved through a new pickup location, a refrigerated locker system, or delivering more fresh foods. At the same time, the project will need to procure a consistent supply of fresh food from the region. Technology such as B2B ordering platforms will aid in streamlining procurement. Finally, delivery vehicles will be used to get products to pickup locations.

Throughout this process, the team will periodically survey and gather feedback from residents to evaluate whether or not this service has improved their ability to access healthy, fresh, and local food.

Outcome 6: Increased purchases from Wisconsin small and medium farmers.

Farmers across the state are struggling with the loss of market, whether from the lack of farmers' market, decreased CSA participation, or loss of contracts with restaurants, small retailers or other outlets. A baseline will be established using existing purchases from food bank and food pantry partners. Growth of purchasing will be measured by the inventory management system established to manage the warehousing, packing, and delivery operations. Additionally, locker usage by CSA and other direct sales from farms will be measured.

Assessments will be periodically taken from both suppliers and buyers to assess food quality and operational efficiency as well as supplier satisfaction.

4. Budget Notes.

Travel

The travel budget is broken into two components and reflects the pricing policy required by the RFP. The largest portion of the budget ($12,240) reflects the requirements to operate a last mile delivery program that covers a large geographic region during the initial stages of the project. The regional food collection travel reflects the statewide collection of food donations and farm products during the 4-month operating period.

Equipment

The project has three primary categories of equipment need as follows:

Rolling stock – Rolling stock line item of $360,000 consists of the acquisition of three medium-duty non-cdl trucks that have been priced using Ryder Logistics and Morgan Bodies as resources. Two of the trucks are 18-foot cab over engine design with a Thermo King dual zone refrigeration Morgan HD body. These units will be the primary consumer and end product delivery vehicles in the last mile delivery system and are expected to service approximately 1,000 accounts per day. The third truck is a 26-foot long (96"w by 110"H) single refrigeration zone van body with 5,000# lift gate and Bustin style steps on rear and side entries.

Refrigerated lockers – This line item of $420,469 includes seven combination freezer/cold storage lockers from T4 Solutions, a Wisconsin Company. The locker pricing includes all control units, electrical connections, and wired internet connections. The units may be installed in both indoor and outdoor locations and are expected to serve approximately 70 families per unit per day for a daily cycle rate of 490 families per day and a theoretical capacity of approximately three times this rate.

Warehouse Equipment and Fit Out – This line item of $601,831 includes all major fixtures and systems required to open the facility as a cold storage warehouse. Items priced include, but are not limited to, 31 classifications and subclassifications of equipment such as refrigeration, material handling equipment, racking, boiler plant, and other capital asset items. Specific attention was paid to pricing used items and items that are currently available on the market for quick deployment.

Supply

Supply includes $261,190 in expendable and overhead items required to initiate operations. The largest expense categories include 5 months of rent and Common Area Maintenance (CAM) for a food distribution ready facility in Sun Prairie; reusable sanitary packaging materials to reduce the waste associated with the project; and operating software required to seamlessly integrate critical control systems such as locker operations ($26,000), routing and logistics optimization ($13,000), and financial and inventory management ($20,000).

Personnel

Personnel is the second largest grant expense at $526,752 and envisions employment of 21 FTE positions. Several significant components should be called out. First, given the level of expected technology adoption in the project, NPC envisions the need for 1-2 IT professionals, a part-time Chief Technology Officer and a project manager with sufficient programming background to write API's to link the project's software systems to outside users. This is a critical element of the project's success and absolutely necessary to a successful outcome. Second, a capable workforce made up of packers, quality control, procurement, material handlers, truck drivers, and customer service representatives is essential to the project achieving its community outcomes. NPC envisions hiring displaced food system workers with existing food safety and food handling experience to fill these positions. As a note: These positions make up more than 50 percent of the total personnel budget. The balance of personnel fall into essential administrative categories.

A full operating plan for deploying and training personnel is being developed.

5. Beneficiaries

Beneficiary	Short-Term Impact	Long-Term Impact
Farms	The project provides an additional market opportunity so people can order and receive their CSA or farmers market products through the locker network. Other farms will also benefit indirectly through grocers and distributors that can move product through more cost-efficient means.	Solving the issue of last-mile delivery will allow more farms to engage in diversified sales channels which leads to resiliency when markets, and conventional supply chains are disrupted. It will also encourage farms to collaborate more to build a regional food system.
Local grocers	An immediate benefit is that the locker pickups will reduce costs associated with last-mile (e.g. door to door) delivery and help local retailers remain competitive.	In the long-run, local grocers will be able to more effectively compete with larger grocers that have a greater capacity to invest in e-commerce and delivery. Additionally, the project can encourage collaboration among participants to support other local agricultural and food businesses.
Local food distributors	Some local distributors have excess capacity; this is an opportunity for them to partner with more farms and grocers to get products to customers.	Greater connectivity and coordination among participants in local value chains can lead to increased efficiencies, reduced costs, and a more resilient network.
Community residents	Residents will have better access to local and regional food. The project allows people to shop for local food, support local businesses, and get products delivered in a safe and lower cost method.	Lockers become a permanent form of community food infrastructure, providing an additional option for household food shopping. As the online purchasing platform offers more local food options, residents will have more choices.
Communities with limited food access	The project addresses immediate food insecurity and emergency food access needs. The project will also help provide access to culturally relevant foods, reduce the technology barrier, and offer nutrition education.	In the long run, there will be reduced disparity in food access. Nutrition and culinary education programming will also lead to improved healthy eating outcomes.
Food Banks and Food Pantries	The project will alleviate supply shortages and enable greater local service levels. The addition of food lockers will increase food safety and reduce exposure to COVID 19.	In the long run, the project will increase collaboration in the supply chain and expand access to local suppliers. Increased use of “no contact” delivery will increase food safety and reduce disparity in food access. Nutrition and culinary education programming will also lead to improved healthy eating outcomes.

6. Monthly Work Plan

NPC has worked with partners such as ACDS, UW Extension, and the Madison Terminal Market Local Team to complete a significant amount of the project planning. This planning includes identifying real estate locations that can be immediately put into use, identifying and pricing equipment and fixtures, meeting with workforce agencies, sourcing necessary supplies, testing software applications, and identifying key development professional and technical service providers. All of this has been done to ensure that the facilities and equipment necessary to implement both the community food hub and regional aggregation center and community food locker elements of the project.

With the above planning complete, NPC and its partners are in a strong position to execute the following start-up actions upon award.

1. Execute lease on 20,000 square foot food logistics facility.
2. Hire and train local staff from dislocated foodservice workforce.
3. Deploy logistics and transactional software.
4. Develop food safety and risk management plans.
5. Acquire and install necessary assets to fit-out facility.
6. Develop maintenance and operating plans.
7. Establish standard operating procedures (SOP), Good Manufacturing Processes (GMP), and standard sanitary operating procedures (SSOP).
8. Apply for necessary operating permits.
9. Develop market rules and procedures.
10. Train farmers, food banks, food pantries, community centers, and distributors in system use.
11. Test systems.
12. Begin market operations as a soft launch.
13. Revise and adapt operations, as necessary.

The above activities can be completed and the facility fully operational within a 4-6 week period. Interim market activities can be started within days if the initial test of logistics and transactional software is completed successfully, and proper insurance coverage is in place.

Once operational, storage and dock space will be available to emergency food providers, farmers, and small food businesses. Shipments will be broken down, temporarily stored by the pallet load, and/or repackaged for last-mile distribution by a trained workforce that is currently furloughed due to COVID-19 restrictions. NPC will engage an outside consultant to train and supervise employees to ensure compliance with food safety protocol and best handling practices to prevent the spread of COVID-19.

A more detailed workplan can be found on the following pages.

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Lead Agency/Support
1	Secure site and finalize commercial 5-year lease	8/10/2020	Grant commitment letter	M1: Complete lease M2: Complete start-up work list M3: Fit out site	NPC
1	Finalize SOPs and MOUs with participating pilot locations.	8/31/2020	Hire staff or contractor Hire legal counsel	M1: Complete lease agreements, legal forms, and terms of service M2: 5 SOPs and MOUs	NPC Legal counsel ACDS UW
1	Implement a refrigerated locker system at seven locations with supporting distribution routes and home delivery.	8/31/2020	Refrigerated locker system Utilities and internet access Insurance	M1: Purchase and set up lockers M2: Successful end-to-end test M3: Training session for retailers, suppliers, and couriers	NPC T4 Solutions ACDS Food pantry and food bank partners
1	Develop and implement a maintenance plan.	Ongoing	Hire staff or contractor(s)	M1: Maintenance plan	NPC Maintenance service provider
1	Initiate and test delivery routes.	8/31/2020	Trained and properly licensed drivers FMCSA Motor Carrier Account DOT Number Logistics software	M1: Take delivery of delivery vehicles. M2: Hired trained and ready drivers M3: Completed DOT paperwork and initial interview M4: Test routing and logistics software	NPC Ryder Logistics Third-party registration firm ACDS Food pantry and food bank partners
1	Develop and implement a food safety plan	8/31/2020 & Ongoing	Hire staff or contractor	M1: Food safety plan M2: Recall plan & test	NPC
1	Develop and launch an online ordering platform or work with participants to develop necessary	8/31/2020	Hire staff or contractor Web development services	M1: Complete wireframe M2: Launch ordering platform (website)	NPC Web development services

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Lead Agency/Support
	e-commerce technologies.		Cloud hosting	M3: API for e-commerce integration M4: First successful transaction	T4 Solutions
1	Work with project partners and locations to minimize technology or cultural barriers.	8/31/2020	Hire staff or contractor	M1: Phone and email order system M2: Plan for accepting orders from elderly M3: Plan for accepting orders from disabled individuals	NPC All partner agencies
1	Partner with food pantries and the food bank.	8/31/2020	Hire staff or contractor	M1: SOP and MOU for each partnership M2: First food pantry or food bank delivery	NPC All partner agencies
2	Coordinate aggregation with suppliers and distribution of products through distribution partner(s).	9/15/2020	Hire staff or contractor	M1: Complete service route M2: Backhaul agreement(s) M3: First grocery delivery M4: First CSA delivery	NPC All partner agencies
2	Finalize SOPs and MOUs with participating suppliers and distributors.	9/15/2020 and ongoing	Hire staff or contractor	M1: SOP and MOU for each partnership	NPC Suppliers Legal counsel
2	Coordinate aggregation with suppliers and distribution of products through distribution partner(s).	9/15/2020 and ongoing	Hire staff or contractor	M1: Complete service route M2: Backhaul agreement(s) M3: First grocery delivery M4: First CSA delivery	NPC All partner agencies

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Lead Agency/Support
2	Create awareness and increase sales through marketing campaigns.	9/30/2020	Marketing materials	M1: Marketing plan M2: Social media plan M3: Create print and digital content, disseminate	NPC All partner agencies
2	Explore ways to increase SNAP redemption.	9/30/2020	Hire staff or contractor	M1: Increase redemption by 25% from baseline	Nutrition Educator and Outreach Specialist
2	Track and report sales and customer trends by analyzing locker usage activity and online ordering platform data.	Ongoing from 9/30/2020	Hire staff or contractor	M1: Determine baseline and targets after the first month. M2: Monthly reports.	NPC Evaluation Specialist
3	Develop and disseminate promotional material through print and digital media.	10/31/2020	Hire staff or contractor Marketing material Custom wrap for lockers and trucks	M1: Custom wrap that features nutrition education material M2: Brochures and flyers, dissemination M3: Digital newsletter for customers, dissemination	NPC All partner agencies
3	Launch a marketing campaign and determine the best approaches to influencing purchasing behavior.	10/31/2020	Hire staff or contractor	M1: A/B test results	NPC All partner agencies
3	Increase healthy eating behavior through education and outreach activities.	Ongoing from 10/01/2020	Hire staff or contractor	M1: Increase consumption of fresh produce by 25% from baseline. M2: Increase the Healthy Eating Index (HEI) by 25% from baseline.	NCP UW Extension

Month	Planned activity	Anticipated Completion Date	Required Resources	Milestones	Lead Agency/Support
4	Solicit feedback through surveys, focus groups, and interviews.	Ongoing from 10/31/2020	Hire staff or contractor Meeting rooms Materials for printed surveys	M1: Pre-pilot survey M2: Mid-pilot survey M3: Post-pilot survey M4: 12 focus groups	NPC All project partners
5	Gather and analyze live data from the grocery lockers, warehouse and online ordering platform.	Ongoing from 9/30/2020	Hire staff or contractor	M1: Summative data analysis	NPC All partner agencies
5	Examine program design, operation protocols, and team function to identify areas of improvement and best practices for implementing projects of this nature and scale.	11/31/2020	Hire staff or contractor	M1: Internal surveys M2: Develop case study, guide, best-practices memo M3: Disseminate findings through local, state, national networks	NPC All partner agencies
5	Refine business model.	11/31/2020	Staff and outside consultants	M1: Draft sustainability strategy M2: Present to stakeholders	NPC All partner agencies