

Multi-Family Housing Recycling Programs



Environmental Science, Policy and Management 4041W:
Problem Solving for Environmental Change

Report 7/8 prepared for the City of St. Louis Park by:

Rylie Olson

Kate Powers

David Rheineck

Stuart Sexton (Project Leader)

Eva Yew

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Key Contributors include:

Dr. Kristen Nelson – Team Manager and Course Instructor
Dr. Gary Johnson – Course Instructor
Katie Clower – Course Teaching Assistant
Anne Donahue – Compost and Urban Agriculture Program Coordinator for Eugene, OR
Dean Elstad – Recycling Coordinator of the City of Minnetonka, MN
Dianna Kennedy – Director of Communications of Eureka Recycling
Jennifer Nguyen – Zero-Waste Education Coordinator of Eureka Recycling
Bill Priefer – Public Works Department of Maplewood, MN
Daniel Ruiz – Environmental Coordinator of Brooklyn Park, MN
Colleen Sinclair – Recycling Coordinator of the City of Coon Rapids, MN
Karen Shragg – Manager/Naturalist of the City of Richfield, MN
Leslie Stovring – Environmental Coordinator of Eden Prairie, MN

Executive Summary

Currently, the City of St. Louis Park uses a franchise system for its multifamily housing (MFH) recycling program. Under this system, every residential building contracts with the recycling hauler of their choosing. As one of eight ESPM 4041W *Problem Solving for Environmental Change* class projects, we worked for the City of St. Louis Park, Public Works Department to evaluate the city's multifamily housing recycling program. The ultimate goal of this project was to provide appropriate recommendations for the city to improve their MFH recycling program.

Research across 16 cities' MFH recycling programs was conducted to compare advantages and disadvantages of existing programs. This cross case comparison was used as an analytical tool to provide a comprehensive understanding of various MFH recycling programs which we then used to develop recommendations for the City of St. Louis Park. We performed a literature review, case studies and conducted interviews with industry and regulatory professionals to gain additional insight on specifics in regard to program implementation and requirements for MFH buildings necessary for a successful and sustainable program.

Future program recommendations are as follows:

- Restructure ordinances and develop a regulatory and system framework tailored to St. Louis Park using the characteristics of a successful program.
- Maintain comprehensive education and communication for residents.
- Start a citywide organized collection program with a pilot project with the intent to gradually phase into a citywide collection program.

Introduction

Recycling is an important action many Americans perform every day; it reduces our reliance on landfills, protects our health and the environment by removing harmful substances from the waste stream, and reduces our need for raw materials which leads to energy savings and conservation of our natural resources (Environmental Protection Agency 2010). Recycling programs are often geared toward single-family homes, where curbside pickup is possible, which has resulted in increased waste diversion rates (CalRecycle 2010). Unfortunately, focus on multifamily recycling programs tends to be overlooked, resulting in low waste diversion rates from multifamily housing (CalRecycle 2010).

Increasing recycling rates in multifamily homes is important because these units generate large volumes of waste due to their high population density. This waste material is a cost to society and the environment; much of it can be converted into profitable materials that benefit society, have high energy savings, conserve our natural resources, and limit the amount of land dedicated to disposal of waste materials (Environmental Protection Agency 2010). The City of St. Louis Park currently has approximately 7,800 multifamily units, and with little room to expand, the city continues to look upwards toward multifamily homes as fulfilling its expansion needs. For this reason, a comprehensive multifamily recycling program is crucial to continue to improve the rate at which waste is used to benefit society rather than diverted to landfills. The City of St. Louis Park recognizes this need to improve its multifamily recycling program and has sought assistance in gathering information about multifamily recycling program options to aid them in developing future plans regarding their own multifamily recycling program.

A successful MFH recycling program involves strong relations between city staff, multifamily housing building management, and recycling haulers who, together, work as a team with residents to achieve success in every building. These strong relationships are built to solve problems regarding program design, information systems, and basic legal frameworks (Eureka Recycling 2004). Later, collaboration on education and outreach programs can be established between all parties. The challenge is to continuously create and re-create relationships in an environment that can be characterized as having a high degree of building management and resident turnover (EPA Region 4, 2010). Without participation and buy-in from all affected parties, program success will likely decrease over time (EPA Region 4, 2010). This is not unique to the City of St. Louis Park, but is a consistent approach that must be used in developing any MFH recycling program.

Comparing MFH to single-family housing recycling programs is not always useful, because the challenges of MFH recycling are unique. MFH recycling programs are characterized by having lower participation rates among residents and subsequently a

smaller amount of recycling collected per ton of total waste per unit than single-family programs (Chamberlain 2008). One reason for this is the inconvenience of recycling for residents. This inconvenience is primarily from limited space in units and outside of buildings, as well as the infrastructure of older buildings that were not designed with recycling in mind. In St. Louis Park, the average apartment building was built around 1978 and recycling was not widely used until later. Other challenges stem from culture, demographics, and levels of education about recycling (Eureka Recycling 2004). These issues vary from building to building and may need different approaches. Due to the unique difficulties associated with MFH recycling, these programs should be compared with other MFH recycling programs and not single family housing recycling programs since the latter are usually more developed, have different demographics, lower resident turnover rates, and residents that are more accustomed to recycling (Chamberlain 2008; Eureka Recycling 2004; EPA Region 4 2010). Once again, MFH and single-family housing recycling programs are not comparable. When analyzing other MFH recycling programs it is important to consider the following questions: How do programs compare to one another? What aspects are the same in both places? What have other communities tried? What are the legal contexts behind other programs? What are relationships between stakeholders like in other programs?

In overcoming the challenges there are three strategic steps to developing a successful MFH recycling program (Eureka Recycling 2004). The first is to develop a program foundation consisting of program design (with a strong legal framework (Chamberlain 2008), recycling program information systems (such as inventory data of contact lists, historical outreach, tonnage reports), and a basic recycling structure (such as type and size of bins, collection times). The second is to conduct outreach by contacting building managers and residents to ask for their help in actively making the community and/or building recycling program a success and have them feel like they are a part of the solution. Finally, individual issues and unique building-specific challenges should be addressed. In summary, building a strong MFH recycling program includes three steps:

Step 1: Build the Foundation

- Develop a strong program design (e.g. the legal framework).
- Establish a system of collecting, updating, and using information.
- Invest in basic recycling infrastructure.

Step 2: Conduct Outreach

Step 3: Solve unique, building specific problems.

The City of St. Louis Park's MFH recycling program strategic directions are guided by being a leader in environmental stewardship, a commitment to being a connected and engaged community, and providing a well-maintained and diverse housing stock (St. Louis Park 2010d). As a contribution to these efforts the City of St. Louis Park asked senior students in a University of Minnesota, Environmental, Science, Policy and Management class (ESPM 4041W) to identify and evaluate options related to

their MFH recycling program that will provide solutions to the challenges related to building and maintaining a strong MFH recycling program.

In developing this project we are committed to fairly and objectively analyzing the City of St. Louis Park's current MFH recycling program and other options the city can consider, as well as providing recommendations for the future of the City of St. Louis Park's MFH recycling program.

Vision Statement

As part of a city vision statement that guides this project, the City of St. Louis Park's four strategic directions are as follows (St. Louis Park 2010c):

St. Louis Park is committed to:

- *Being a connected and engaged community.*
- *Being a leader in environmental stewardship. We will increase environmental consciousness and responsibility in all areas of city business.*
- *Providing a well-maintained and diverse housing stock.*
- *Promoting and integrating arts, culture, and community aesthetics in all city initiatives, including implementation where appropriate.*

As one of eight ESPM 4041W *Problem Solving for Environmental Change* class projects, we are guided by the following class vision statement:

St. Louis Park will be a model of environmental stewardship by providing residents and future generations with educational tools and sustainable practices to foster a community of ecologically conscious and engaged citizens.

In this project, our team is guided by the following comprehensive vision statement:

The City of St. Louis Park will have an appropriate, viable and sustainable multi-family housing recycling plan to achieve their goal of being a leader in environmental stewardship by increasing environmental consciousness in all areas of city business.

Goals and Objectives

Identify and recommend a MFH recycling program that is appropriate, viable and sustainable for the City of St. Louis Park.

The following objectives are the drivers of this report:

1. Compile and update current data sources from St. Louis Park in order to provide a coordinated resource for St. Louis Park officials to use when evaluating MFH recycling needs.
2. Develop an analytical tool to evaluate diverse multifamily recycling programs:
 - evaluate MFH recycling programs in other communities, and
 - assess the City of St. Louis Park's ordinances and laws as applicable to their MFH recycling.
3. Provide recommendations for future implementation of sustainability initiatives for the City of St. Louis Park's MFH recycling programs.

Site Description

The Village of St. Louis Park was incorporated in 1886 and development began from the intersection of the Minneapolis and St. Louis Railroad with Wooddale Avenue (St. Louis Park 2010a). In 1954, as the area grew, the home rule charter that changed the City of St. Louis Park's status to a city was approved by voters. Much has changed from 1954 to 2010; the development focus changed from paving streets, expanding water and sewer systems and updating zoning and construction codes to the current focus on redeveloping infrastructure to create a livable and walkable community (St. Louis Park 2010b).

St. Louis Park, Minnesota is a suburb located in the metropolitan area known as the Twin Cities -Minneapolis and St. Paul. The City of St. Louis Park is a first-ring suburb of 10.8 square miles, located just west of the city of Minneapolis with a population in 2007 of 45,216. It is not contained by geographical barriers, such as oceans; rather it is contained by surrounding cities which limit its expansion. Therefore, St. Louis Park can only expand upward. The community is comprised of mainly residential areas including 35 neighborhoods, with an increasing number of multifamily units (Figure 1).

As of 2009, St. Louis Park housing consisted of 62.9% owner-occupied housing units, 37.1% renter-occupied housing units, and 5.2% vacant housing units (U.S. Census Bureau 2010). As the City of St. Louis Park continues to grow, multifamily housing will increase (St. Louis Park 2010f).

The population density and demographics have also changed from the City of St. Louis Park's early beginnings. Starting with a population of 499 in 1890, growth skyrocketed between 1940 and 1950 as the population expanded from 7,737 to 22,644, and then again almost doubled to 43,310 by 1960. The population has remained approximately 43,000 people since 1960 and is only projected to grow to 47,000 by 2010 (St. Louis Park 2010d). Demographics of the city have changed

slightly in the past ten years. In 2009, 10.4% of St. Louis Park residents were born in a foreign country (up 1.7% from 2000), 12.9% spoke a language other than English at home (up 2.5% from 2000), and 46.3% had a Bachelor's degree or higher, up 3.1% from 2000 (U.S. Census Bureau 2010). Today the median age is 35.7 years (St. Louis Park 2010d).

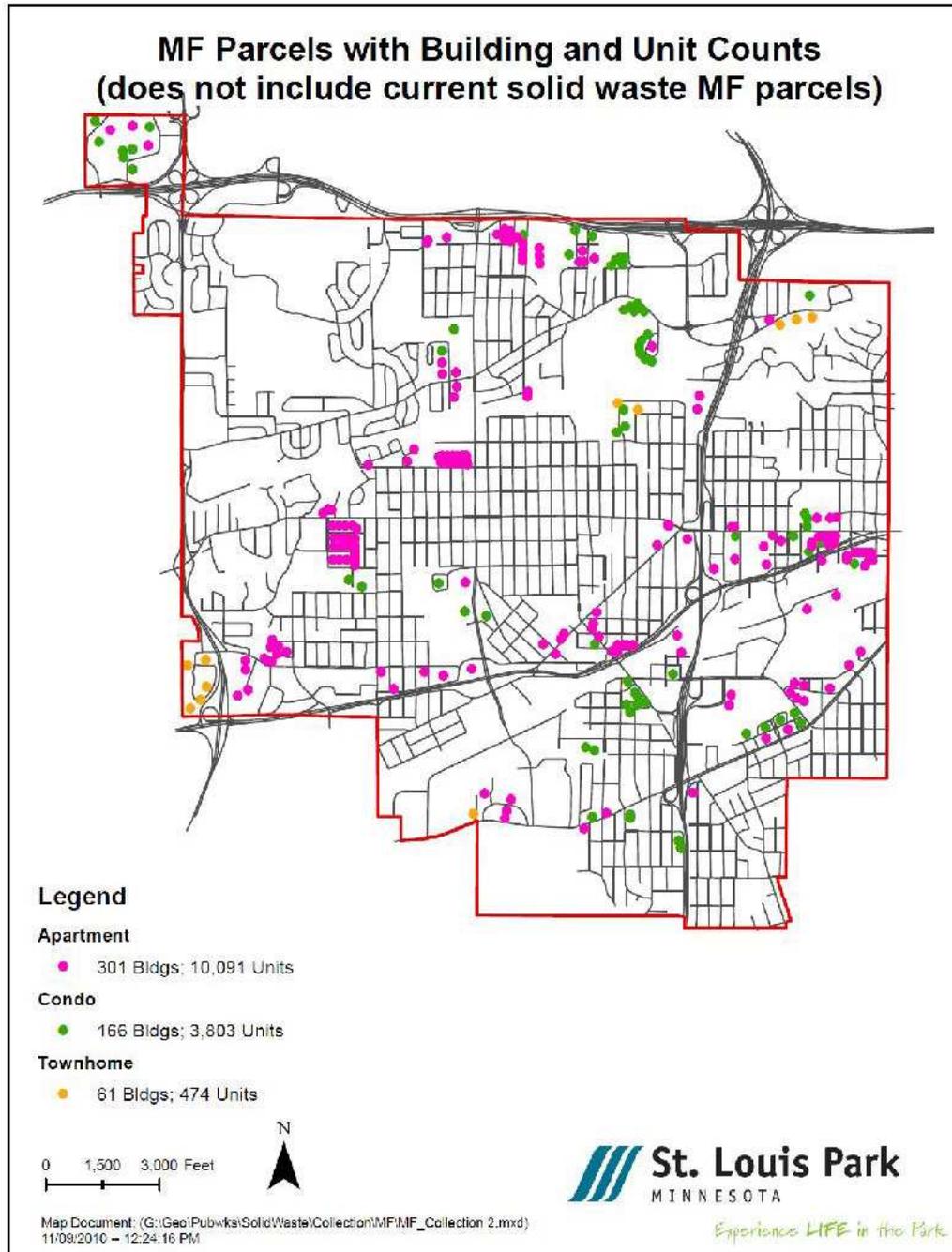


Figure 1. St. Louis Park MFH parcels with building and unit counts, 2010.

Methods

To gain a better understanding of the current state of municipal MFH recycling programs, we researched individual communities, performed case study analysis, developed informational database systems, and conducted informational interviews. Investigating what other communities have done, we compared advantages, disadvantages and personal opinions about their respective MFH recycling programs. This research provided a comprehensive understanding of a range of MFH recycling programs, which we then used to develop recommendations for the City of St. Louis Park.

First, we received a list of local and national municipalities from St. Louis Park staff that either were similar in size and demographics or were seen as leaders in MFH recycling (Table 1). We investigated each city's MFH recycling program through personal interviews with recycling coordinators and a document review of the publicly available online information including laws, ordinances, and program documents. We compiled the information regarding MFH recycling programs, city demographics and city codes. The interview questions focused on current program structure, outreach, laws and ordinances, hauler contracts, likes and dislikes of current programs, and future visions of programs (*Appendix A*).

Table 1. Comparison cities selected MFH research analysis, 2010.

Minnesota Cities	Other Cities, United States
Bloomington	Boulder, CO
Brooklyn Park	Bothell, WA
Coon Rapids	Eugene, OR
Crystal	Pottstown, PA
Eden Prairie	
Maplewood	
Minnetonka	
New Hope	
Richfield	
Roseville	
St. Paul	

The case study analysis focused on common methods used to increase recycling rates, potential limitations of methods used to increase recycling rates, and other research needs.

Finally, we conducted interviews with industry and regulatory professionals to gain more insight on characteristics of program implementation as well as building requirements necessary for successful and sustainable programs.

Supporting Activities: We constructed an informational database by updating and consolidating MFH information for the City of St. Louis Park. This database is

currently used by SLP in the implementation of their MFH recycling program as a continuous improvement assessment tool (*Appendix B*).

Findings

Our findings were derived from developing a literature review of already existing community MFH recycling programs in the United States, interviews with community recycling staff and other experts in the field, and from general case studies on the topic of MFH recycling. The communities we selected were recommended to us by the City of St. Louis Park staff. We will first discuss literature review findings and then discuss the comparison of various city MFH recycling programs as they relate to the City of St. Louis Park.

Literature Review

In reviewing the literature on MFH recycling, a few main themes were apparent and present throughout the information (further detail of literature can be found in the Appendix C). Both the EPA's (2001) *Multifamily Recycling-A National Study* and Eureka Recycling's (2004) *Exploring Multifamily Recycling-Tools for the Voyage*, identified MFH recycling as "low hanging fruit" and a key opportunity to increase overall city-wide recycling. The EPA Region 4 (2010) study found that there were monetary benefits by increasing MFH recycling. For high diversion programs, the average cost to recycle dropped from \$173/ton to \$113/ton resulting in significant cost-savings.

In order to improve MFH recycling, the authors suggest focusing on the foundations of the recycling program. According to Eureka Recycling, the three important elements of the foundation are the program design, information systems and basic recycling structure. Program design looks at the ordinances behind a recycling program, which help or hinder the success of the program. Information systems refer to data collection requirements for each multifamily unit, including collecting tonnage information. Basic recycling structure refers to the location, condition and labeling of recycling carts at each building.

In developing a successful MFH recycling program, it is crucial to require haulers to collect certain information from each multifamily complex. Information to be collected should include tonnage reports on the quantity and quality of materials collected, details about the building layout (trash chutes, location of recycling carts, etc.), outreach history, improvements in the quantity and quality of recyclables based on outreach efforts, and history of problems with the buildings (Eureka Recycling 2004; EPA Region 4, 2010; Foth LLC 2009; Beck 2010). Recording this information

in an easily accessible and readable database will allow recycling coordinators to identify which buildings need more focused efforts as well as help identify noncomplying complexes for enforcement.

In regards to the recycling structure, a few basic themes were apparent. First, proper labeling and signage around the recycling area as well as the bins themselves provided a key differentiator in high waste diversion recycling programs as opposed to low waste diversion programs (Beck 2010; Eureka Recycling 2004; Nguyen 2010).

The number of bins available for recycling was another common theme across the literature and interviews and also serves as another indicator of high and low waste diversion programs (Beck 2010; Kennedy 2010). Specifically two to three 90-gallon recycling containers for paper/cardboard and one to two 90-gallon containers for aluminum and glass per 11 to 25 units should be provided to residents (Kennedy 2010).

In conjunction with proper labeling/signage and providing an adequate number of bins relative to the size of the complex, increasing the range of the recyclables allowed in the bins will likely decrease contamination of the bins. Eighty-two percent of successful MFH recycling programs provide the option to recycle a wide variety of materials (EPA Region 4, 2010). Residents get confused when seemingly recyclable materials are in fact unrecyclable, so by increasing the range of accepted recyclables, the previously unrecycled material in the carts will not be considered contamination and will consequently decrease contamination rates. This approach has been taken by the City of Coon Rapids.

In the analysis of Waste Collection Service Arrangements, the MPCA noted that changes to multifamily recycling programs are usually accompanied by hauler backlash against the changes. In some cases, haulers will contact residents to gather support against the proposed changes. Educating the public on the benefits of the changes is therefore important to decrease resistance (Kennedy 2010).

Demographic Comparisons of City MFH Recycling Programs

Demographics affect the success of any recycling program; therefore it is important to determine where the City of St. Louis Park is heading in the future to design and implement a recycling program that will be sustainable (Eureka Recycling 2004).

The density of any city influences the proportion of MFH present. MFH houses people of all ages, income and education levels and cultures. Regarding age, it may be difficult for seniors to carry recyclables a long distance, so Eureka Recycling recommends locating the bins close to each unit. Similarly, children who do not read can be encouraged to recycle by placing images on the bin labels. MFH is commonly composed of people from various cultures who speak different languages. The toolkit

mentions that communities with large populations of non-English speaking residents create a special set of circumstances to work with to ensure that recycling education initiatives are effective (Eureka Recycling 2004).

As late as 1970, 99% of the City of St. Louis Park's population was Caucasian. By the year 2000, however, Caucasians made up 89% of the population, with African Americans, Asians, and Hispanics comprising the remaining residents (City of St. Louis Park 2010f). A diverse population does not necessarily mean that recycling rates will be negatively affected, but it often means that a larger proportion of the population has recently arrived from a country where recycling might be an unfamiliar task. It is, therefore, important to take into consideration a variety of languages and cultures when attempting outreach in MFH.

Among the 16 cities evaluated, St. Paul, MN, had the largest population (287,151 people) and largest land area (56.16 square miles). The City of New Hope, MN, had both the lowest population (21,372 people) and the smallest land area (5.1 square miles) (Figures 2 and 3).

Knowing the population density of each of these cities is useful in evaluating the cost effectiveness of each city program because the denser a city, the more cost-effective the recycling. St. Paul, MN, with 5,113 people per square mile, had the highest population density of the cities evaluated and also has one of the oldest multifamily recycling programs in the nation (Figure 4). The City of Minnetonka, MN, had the lowest population density with 1,796 people per square mile. St. Louis Park has the fourth highest population density with 4,084 people per square mile.

Typically, the denser a city is, the more MFH units are present within the city. With a large amount of MFH, there is greater need for a comprehensive MFH recycling program. Of the cities investigated, St. Louis Park was in the top third for the number of MFH buildings, which are defined as buildings with 5 units or more (Figure 5).

State, County, and City Recycling Ordinances

Comparing other communities' MFH recycling programs allowed us to identify the different options available for MFH recycling, specifically the city's legal codes because each program's scope is limited by the respective city codes. By identifying the similarities and differences between other city codes and St. Louis Park's code, we can recommend possible changes required for a multifamily recycling program. The city codes were evaluated based on five criteria: the type of recycling program the codes specify, enforcement, the definition of "multifamily," information required by the code, and educational duties.

The Minnesota State Code, in conjunction with many other state codes, establishes that all cities must require recycling service be provided for both residential and multifamily dwellings. In fact, all but seven states set recycling mandates in 1995 (Walls 2003). Consequently, each city code investigated had this as a requirement. The variation in codes occurs in the way this requirement is satisfied.



Figure 2. Population comparison of the cities analyzed by MFH building, 2010.

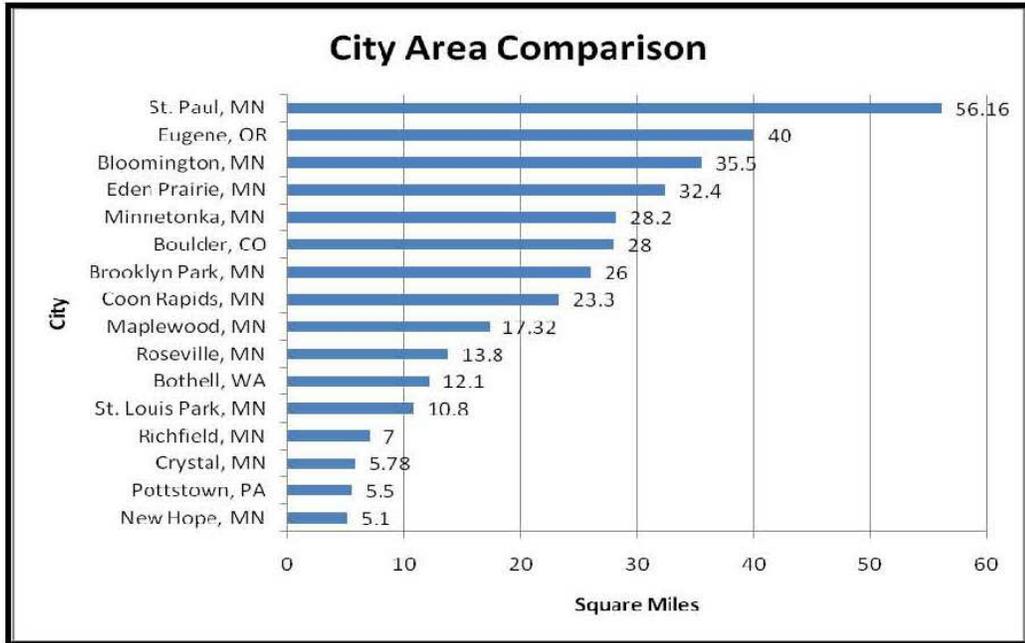


Figure 3. Area comparison of the cities analyzed by MFH building, 2010.

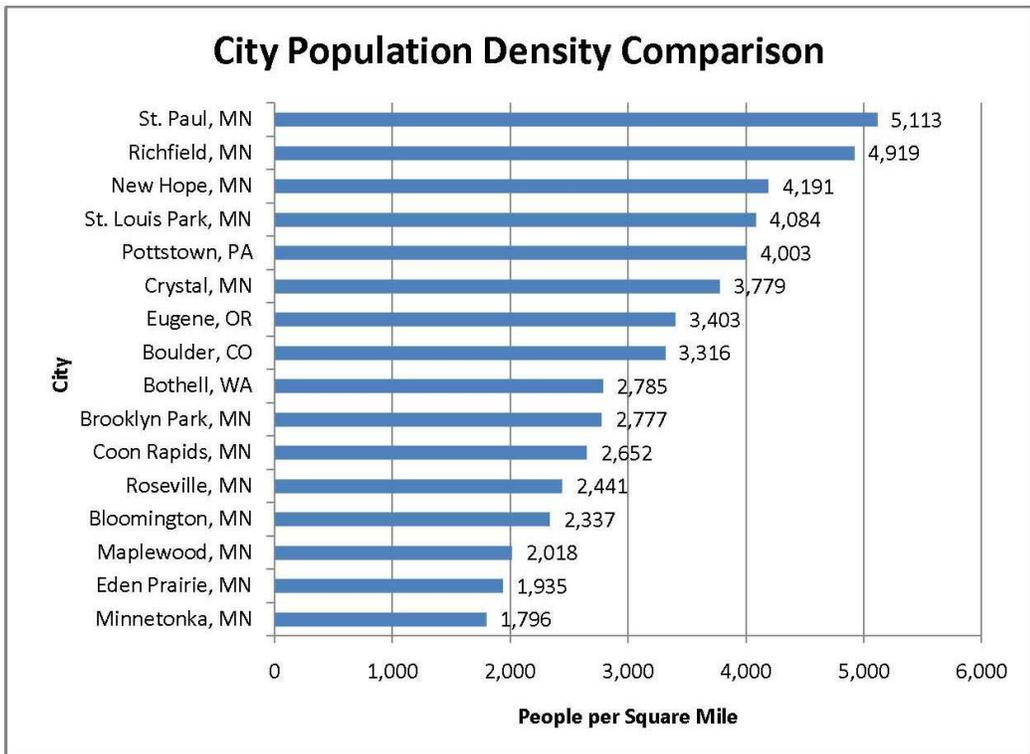


Figure 4. Population density comparison of the cities analyzed by MFH building, 2010.

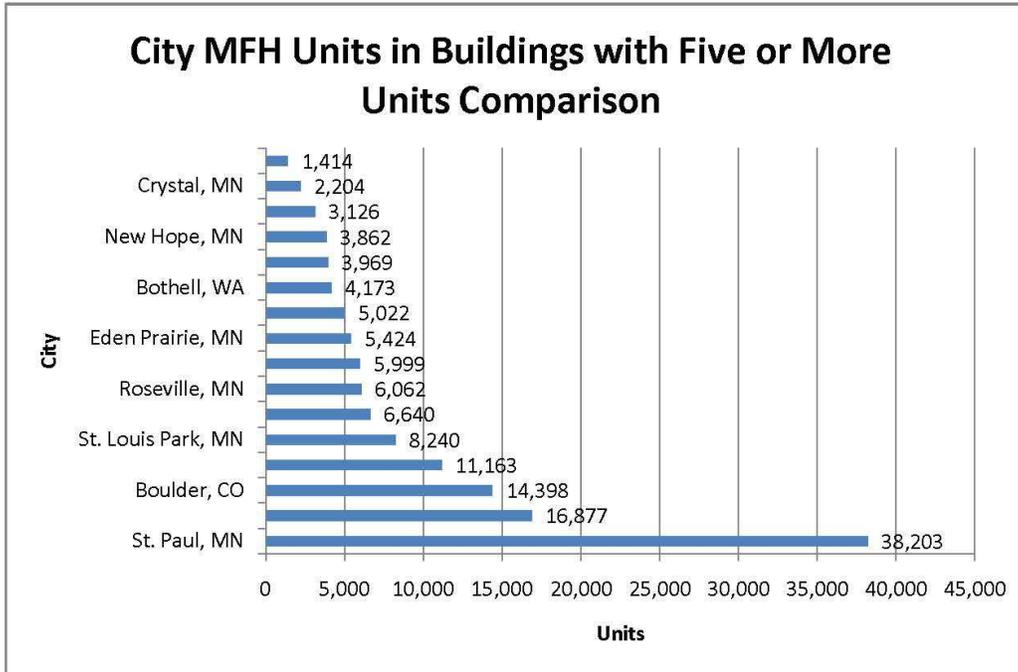


Figure 5. MFH units in buildings with five or more units comparison of the cities analyzed by MFH building, 2010.

Similarities

The majority of the cities had a code that requires franchise recycling programs for MFH, where the cities license haulers who can then be contracted to pick up residential and multifamily recycling (Table 2). There are two types of franchise programs that exist within these codes (Figure 6):

Situation 1: residents and multifamily owners/managers must contract directly with any city-licensed hauler regardless of their location within the city.

Situation 2: residents and multifamily owners/managers must contract directly with a specific city-licensed hauler depending on their location within the city.

Some cities had a code that differentiates between two types of recycling programs: One that is for residential and might include some MFH, and another for multifamily units that fall outside the specified criteria. For example, some Minnesota cities such as Brooklyn Park, New Hope, Minnetonka, and Crystal had a citywide recycling program for residential dwellings including multifamily dwellings with 8 units or less. All multifamily dwellings with more than 8 units were required to participate in the situation 1 franchise recycling program. Brooklyn Park, Crystal, and New Hope

had a unique code in that they participate in a collaborative recycling program with Brooklyn Center, MN, collectively called the Hennepin Recycling Group.

Table 2. City recycling code similarities among the cities evaluated, 2010.

City	Franchise (situation 1)	Franchise (situation 2)	City-Program	Open Hauling	Mandatory Separation	Enforcement	Education	Definition of Multifamily	Information Required
Minnesota Cities									
St. Louis Park	X							5 units ≤	
Bloomington	X (>8 units)	X (≤8 units)			X	\$100 fines after 2-3 violations		3 units ≤	Tonnage
Brooklyn Park	X (>8 units)		X (8 units ≥)		X	Variable punishment		> 4 units	
Coon Rapids	X					Fines after 2-3 violations (\$300/unit)		> 4 units	Tonnage
Crystal	X (≥8 units)		X (<8 units)			Petty Misdemeanor, 3 and after a misdemeanor	Provided by owners	3 units ≤	
Eden Prairie	X					Petty Misdemeanor, 4 and after a misdemeanor	Provided by owners		
Maplewood	X							3 units ≤	
Minnetonka	X (≥ 8 units)		X (<8 units)					> 4 units	
New Hope	X (>8 units)		X (8 units ≥)			Petty Misdemeanor, 3 and after a misdemeanor		> 8 units	
Richfield	X								Tonnage for ≤ 8 units
Roseville			X					5 units ≤	Tonnage for Each Building
St. Paul			X		X			5 units ≤	Tonnage for Each Building
Other United States Cities									
Boulder, CO	X (all multi-family units)					Variable punishment	City provides education to haulers	Occupants using a common system of collection	Tonnage
Pottstown, PA				X		Fine of \$50-\$60; never been levied		> 6 units	Tonnage
Eugene, OR	X					Civil Penalty	Provided by Haulers		Tonnage
Bothell, WA		X					Provided by the Haulers		

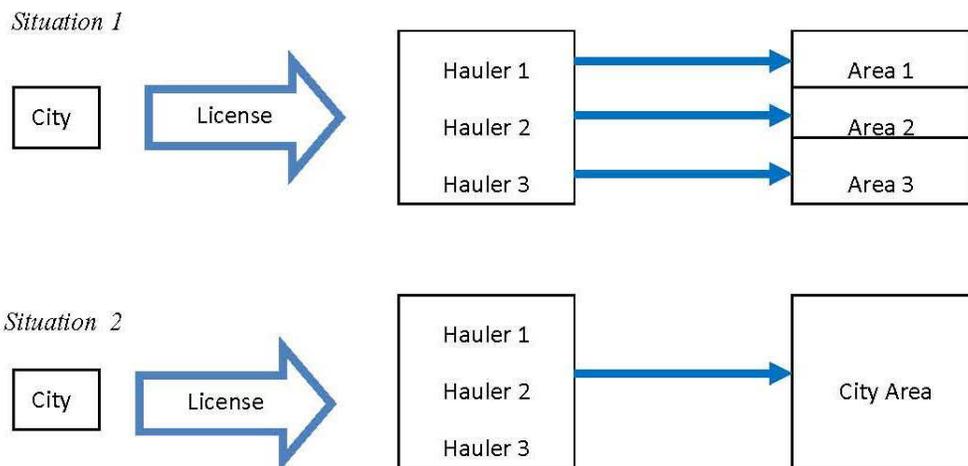


Figure 6. Differences of the two MFH recycling franchise programs, 2010.

Two Minnesota cities, St. Paul and Roseville, had a code that specifies a city-wide recycling program that included not only all residential dwellings but also all multifamily dwellings. Roseville’s code allowed for some adaptability—it exempted multifamily dwellings that already had a recycling contract with another hauler until a specified time, by which all multifamily dwellings must participate in the city-wide program. Only Pottstown, PA, has a code that specified an open hauling recycling system where residents can contract with any hauler. This type of program reduces the city control over the recycling program because licenses are not involved.

Some cities, such as Coon Rapids and Richfield, MN, have programs similar to St. Louis Park. MFH building managers or owners were required to choose their own hauler to pick up recyclables, but compliance with parts of this requirement does not always occur or information on whether compliance was occurring was not available (Sinclair 2010; Shragg 2010). If recycling managers or owners did not comply with the ordinances, fines were levied against buildings. One such instance involved a fine of \$300 per unit in a building that refused to offer recycling (Sinclair 2010).

Differences

One key difference between St. Louis Park’s code and the other city codes was that St. Louis Park specified a franchise program for multifamily recycling, but also allows for the possibility of a citywide program. Subsection “a” states that, “the city, at any time, and from time to time, may contract with a hauler for collection of recyclables from some or all complexes, and if the city so contracts, the recyclables shall be collected from the premises by the collector under contract with the city on terms and conditions set out in such contract.” This provision allows the city leeway to change their current recycling program without amending the city’s current code.

Boulder, CO, also has a unique code in that it follows a franchise (Situation 1) recycling program but requires haulers of multifamily units to pick up recycling at no additional charge beyond that agreed to by the trash collection service. One of the challenges of multifamily recycling is to encourage the owners/managers of multifamily units to work to increase recycling participation and decrease the contamination of recycling bins. By eliminating the cost of providing the recycling service, owners/managers of multifamily units are more willing to allocate resources to improve participation and reduce contamination of the bins (Dianne Kennedy, Eureka Recycling Interview). Minnetonka, MN uses incentives to decrease garbage bills and taxes, and “one complex cut their trash service by 10 percent” as a result (Elstad 2010).

Most of the city codes require that haulers have a license to be eligible to collect recycling. However, Eugene, OR, does not require a license for certain categories of haulers. Under section 3.245 of the city code, Eugene requires all haulers be licensed to collect recycling except for “A civic, community, benevolent or charitable non-profit organization that collects, transports and markets source separated materials for resource recovery, but only for the purpose of raising funds for a charitable, civic or benevolent activity.”

Other differences also exist within the city codes besides differences in program type. While all cities require that recycling service be provided for both single family residents and multifamily residents, some Minnesota cities such as St. Paul, Roseville, Bloomington, and Brooklyn Park go a step further and require mandatory separation of recyclables, effectively requiring that all residents recycle. Enforcing this would prove to be difficult. However, it highlights the cities’ commitment to conserving resources and improving the environment through recycling.

A key component of a successful recycling program involves educating residents about why recycling is important and the benefits of recycling. Educational requirements vary among the codes, specifying who distributes the educational materials and the quality of the educational materials provided. These two variants seem to have a correlated relationship. When the owners of multifamily buildings are in charge of the educational materials, the required standards are reduced often resulting in reduced quality of educational materials (Kennedy 2010). These standards are to distribute the materials, provide notice of the availability of a recycling service, and procedures required for the separation of the recyclables and the dates/times of collection. Conversely, when haulers are required to provide educational packets to new residents of multifamily dwellings, the city codes require specifying the materials collected, collection schedule, materials preparation and the benefits of recycling, resulting in a higher quality education for residents. Often times, haulers are also required to clearly label recycling containers, an important characteristic for successful multifamily programs (further program details can be found in the Appendix D).

Table 3. City MFH recycling rate comparison.

City	Tonnage or Recycling Rate	Type of Program
Minnesota Cities		
St. Louis Park	Unavailable	Franchise Situation 1
Bloomington	Unavailable	Franchise Situation 1 (>8 units) Franchise Situation 2 (≤ 8 units \geq)
Brooklyn Park	Unavailable	Franchise Situation 1 (>8 units) City Program (≤ 8 units)
Coon Rapids	77.83 lbs/unit/year (MFH)	Franchise Situation 1
Crystal	Unavailable	Franchise Situation 1 (≥ 8 units) City Program (≤ 8 units)
Eden Prairie	Unavailable	Franchise Situation 1
Maplewood	Unavailable	Franchise Situation 1
Minnetonka	Unavailable	Franchise Situation 1 (≥ 8 units) City Program (< 8 units)
New Hope	Unavailable	Franchise Situation 1 (>8 units) City Program (≤ 8 units)
Pottstown, PA	335 lbs/person/year (Citywide, Open Hauling not MFH)	
Richfield	Unavailable	Franchise Situation 1
Roseville	351 lbs/unit/year (MFH)	City Program
St. Paul	207 lbs/unit/year (MFH)	City Program
Other United States Cities		
Bothell, WA	10% recycling rate for MFH (10% recycling rate for commercial and 61% recycling rate for single-family homes)	Franchise Situation 1
Boulder, CO	50% recycling rate for single-family homes and 23% recycling rate overall	Franchise Situation 1
Eugene, OR	52% recycling rate or 1,320 lbs/person/year (Lane County, not just MFH)	Franchise Situation 1
Pottstown, PA	335 lbs/person/year (Citywide, Open Hauling not MFH)	

Recommendations

After thorough research surrounding multi-family housing (MFH) recycling programs, including case studies and literature reviews, we have developed the following three recommendations for St. Louis Park and the future of its MFH recycling program.

Recommendation 1: Restructure ordinances and develop a regulatory and program framework tailored to St. Louis Park using the characteristics of a successful program

For the City of St. Louis Park to increase the quantity and quality of recycled materials collected from MFH complexes we recommend restructuring ordinances and developing a framework tailored to St. Louis Park based on the characteristics of a successful program discussed in the previous findings. Proper program analysis and adaptation cannot occur without accurate information collection from the haulers regarding recycling tonnage and quality.

First, we recommend that ordinances be restructured in order to require tonnage and quality reports from each complex for easier enforcement and comprehensive waste stream analysis. Regardless of the future direction of St. Louis Park and MFH recycling, tonnage and quality information can provide the City with a better understanding of waste and recycling generation. In addition, enforcement of the code will be easier, and the information can be used to support funding proposals, as well as general oversight. The tonnage and quality information can be used for program analysis, specifically noting what types of signage and outreach influence recycling rates and quality (discussed in further detail in Recommendation 2). We recommend utilizing a database, similar to the database found in Appendix E, for program data collection and further analysis. The information found in this database would include geographic data, contact information, and building tonnage and quality.

It is critical to anticipate hauler reaction to changes in the ordinances. Typically, haulers perceive changes in a program to be disadvantageous and in response, distribute mailings that emphasize their view on organized collection and urge residents to contact city officials to oppose a change in the program (Foth LLC 2009). St. Louis Park should be transparent with the residents and building managers while going through the transition process, making sure to highlight the benefits of the proposed changes and acknowledge any costs as a tradeoff worth incurring in order to ensure a smooth transition. St. Louis Park can do this by providing newsletters to building managers and owners about the details of the ordinances as well as information on program successes to ensure a positive message while reminding managers of the potential fines from noncompliance.

We also recommend that St. Louis Park require mandatory separation of waste and recyclable materials within the city code. This highlights the city's values and commitment to environmental stewardship. Local communities such as Roseville and St. Paul, MN, have mandatory recyclable separation. St. Paul, MN, has the oldest and most successful MFH organized recycling program in the nation (Kennedy 2010). With this suggestion we also recommend that the city increase the range of recyclables collected. By increasing the range of materials that can be recycled in the multi-family recycling program, there will likely be a decrease in contamination of the carts because much of the current contamination can be attributed to confusion on which plastics can be recycled (Kennedy 2010). This can be achieved by using resources such as www.earth911.com to find markets or businesses willing to buy higher level plastics or other obscure materials. Local Minnesota communities have taken advantage of broader plastics markets, for example; Coon Rapids has entered into partnerships with Consolidated Container and HOM Furniture. Consolidated Container hauls higher level plastics at no charge to the city and resells the material to other companies that process it into products. HOM Furniture hauls Styrofoam at no charge to the city and processes the materials itself (Hanson 2008). Using tax incentives, St. Louis Park could encourage start-up recycling companies within the city that recycle materials without a current end market. This would create new jobs in St. Louis Park, develop a market for plastics without a current market, and expand the tax base for St. Louis Park. It would take time and effort to encourage a start-up business but the benefits would far outweigh the costs.

Finally, we recommend that St. Louis Park locks into future contracts on a per unit rate. This should be something that is required within the Request for Proposal so that there will be no surprises for bidding haulers. A per unit rate will also ease the burden on the Billing Department. This program structure creates the greatest monetary incentive to recycle because it will not increase cost to buildings if more bins are needed; while recycling increases, solid waste will be diverted, allowing complexes to have fewer pulls per week or smaller dumpsters which would decrease their waste removal costs (Kennedy 2010). This provides the greatest incentive to maximize the quantity of recyclables set out for collection without increasing fees. Conversely, a variable fee for waste collection will discourage greater quantities of refuse entering the waste stream. This cost savings should be shared with residents in order to feel a sense of accomplishment and inclusion in a community effort while enjoying the benefits of the decreased costs.

In summary, restructuring the ordinances and framework through required tonnage and quality reports, mandatory separation, and per unit rates will help to increase recycling rates and quality of recycled materials throughout St. Louis Park.

Recommendation 2: Maintain comprehensive recycling education and communication for residents

To increase recycling rates and quality of recycled materials we recommend informing residents of program details and benefits through communication and educational materials. There is an inherent issue of high turnover of residents and management within MFH, therefore it is important to have strong educational material to ensure quality material collection.

First, we recommend biannual informational mailings that include details on recycling, the successes of the program, new announcements such as program or ordinance changes. This will keep residents informed on changes in recyclable materials collected and program infrastructure. Additionally the information gathered from each building, including tons recycled, would be a useful motivator for continual participation. Providing feedback to residents helps them understand that their efforts do indeed make a difference. There may appear to be nothing new to a senior recycling coordinator, but old news may be new to residents. The City of St. Louis Park can work with the hauler to provide a template of necessary program information for residents including: what is recyclable, where the recycling bins are located, and when recycling is picked up. This template can be customized by the building managers and distributed by the haulers.

Second, recycling informational packets should be provided to residents at move in. This will inform new residents about the building practices, the use of inclusive language in these documents can create a culture of recycling and a sense of ownership of the program.

Third, it is important to use multilingual educational and communication materials with clear images on the bins and in the recycling areas in order to capture residents at the “moment of discard” (Kennedy 2010). Images are important for underrepresented language groups and children. Analysis of resident demographics will be integral in understanding what languages need to be represented, and what future languages might be needed. This is why it is necessary to understand the city demographics; as the population composition changes, so will the languages and therefore the recycling outreach information will need to be adjusted appropriately in order to maintain recycling rates.

In summary, communication and educational materials should be consistent and tailored to the buildings and resident population in order to maintain recycling quality and rates.

Recommendation 3: Citywide organized collection program for MFH in St. Louis Park

We recommend a pilot program be used for the City of St. Louis Park to understand the feasibility and potential outcomes of a citywide organized recycling collection program for MFH. A pilot program allows St. Louis Park to test the previous recommendations and analyze their feasibility for a future program. The pilot program can be used as a learning tool that is flexible, observed by all relevant participants, and designed to modify approaches as lessons are learned. We recommend you work with active members of the community, for example, individuals involved with the St. Louis Park Rental Coalition to develop the pilot program. In addition, it will be important to get a diverse sample of buildings because different styles of buildings will have different requirements, providing insights into the range of services necessary for successful implementation. The pilot program can be designed to last a minimum of one year, or any amount of time the city deems appropriate, but there has to be sufficient time to allow for data collection, analysis and discussion among stakeholders about possible adjustments.

One of the most important resources developed through a pilot program are communication channels. There are at least four stakeholder groups necessary for the development and success of the pilot program including the hauler, building management, residents, and city officials in diverse departments. Communication channels will be, by necessity, two-way information sharing approaches but the critical topics will vary between stakeholders (Table 4). These communication channels can develop strong relationships that can be created during the pilot and maintained during full scale implementation.

The relationship between the hauler and the city is very important because it creates the backbone for the program. The contract is the most detailed formal document that establishes obligations as well as how the stakeholders will communicate and interact. It can specify bin responsibility, per unit rates, collection route options and willingness to participate in both the pilot program and citywide program. Overtime tonnage and quality information is vital for a sustained increase in recycling (Eureka Recycling 2010), therefore the data collected by the hauler should be shared with the city to analyze and be used for program evaluation by all the stakeholders. The communication between the city and building management will be important in creating buy-in and preventing pushback on a new program. Building management should feel comfortable communicating with the city when adjustments are made to the program so that feedback about different aspects of the program, both those that are successful or unsuccessful, can be communicated with the city.

Table 4. Two-way stakeholder communication matrix.

	City	Hauler	Resident
City	Internal logistics between billing and Public Works Department	Contractual agreement - collection routes - per unit rates - bin responsibility - be willing to actively participate in pilot program with potential to full citywide rollout Educational material templates Tonnage/quality information - hauler collects information and reports to city quarterly	Inform residents on policy changes
Building Management	Ordinance enforcement Adjustments to program implementation - understanding what is and is not working	Where bins will be located When additional bins will be needed Distribution of educational material-information gathering for site specific information	Proper signage Outreach distribution - move-in packet - bi-annual newsletters Ease of recycling locations

The communication channels can allow for an open feedback loop, providing for critique and evaluation of the program by the participants. The information shared should include what is and is not working with suggestions for potential adjustments that can happen in a timely fashion. The shared information can be used to apply what is successful at one building to a different building that may be experiencing problems in a similar area, for example signage location and language, bin location and size, newsletter content, and billing. The open feedback will decrease resistance by providing transparency and aid in overall buy-in because all stakeholders should feel more comfortable sharing their opinions as they will be working together to eventually create a successful program.

Evaluation of the pilot program can be used to determine the potential overall success of a full program, if diversion has increased as a result of outreach and education. The evaluation should draw attention to areas of the program that need to be overhauled before a citywide rollout is implemented. It should also showcase pieces that are especially successful that can be shared across the program and implemented in future programs. Finally, the evaluation can include the logistics of incorporating MFH with single-family pick-up routes.

The pilot program presents a few unique challenges that are important to address before any future programs are implemented. Resistance may be a large barrier to full implementation of the program. For example, the building management may be resistant to change because they feel their freedom to choose is being taken away. People are generally resistant to change and would rather maintain their current infrastructure of bins and signs. It will be important for St. Louis Park to be proactive

in getting managers involved in the pilot program, reinforcing the importance of communication, and highlight the potential benefits of reduced cost of waste collection and increased recycled material collected.

The hauler may resist the program because of the potential loss of business if they do not win the overall bid. As stated earlier in recommendation one, in other cities haulers are known for contacting residents directly and emphasizing their view on organized collection. In order for St. Louis Park to address potential resistance, all haulers could be asked to bid for the contract. And the city could request that these haulers be transparent with the residents and management while presenting the overall benefits of the program for both the residents and the city.

Some city officials may resist the program because of the start up costs associated with a pilot program. With funding from grants such as the Hennepin County Waste Abatement Incentive Fund and the US EPA Region 5 Municipal Solid Waste Grant, the financial burden can be reduced. One example of where this approach was successful was Chicago, who received a grant from the EPA Region 5 Municipal Solid Waste Grant for the creation of their MFH recycling pilot program (US EPA Region 5, 2010).

There are a few logistical challenges that must be overcome before successful implementation can be achieved. Internally, getting the Billing Department involved in the pilot will be important as they determine the best practices for billing the buildings on a per unit basis. The year-long pilot program should help mitigate any large logistical issues for this department. Initially for the Public Works Department program enforcement and subsequent data analysis of the information provided by the hauler will be a logistical challenge. The pilot program will aid the Public Works Department in determining if a new role needs to be created, or if the workload can be spread across the current team.

Finally, external logistical challenges include route determination, bin location, and outreach specifics. First, routes need to be determined, specifically whether they will be integrated into the single-family recycling routes, or if there will be separate trucks with separate routes for the MFH recycling. Second, bin location is something that building management and the hauler will need to determine. The bins will need to be located in an easy location for the residents and for the hauler's trucks. These decisions will need to be made jointly by the hauler and building management. Third, outreach materials will need to be specialized for each building in regards to their specific program needs and successes. The majority of these challenges fall with the hauler, therefore it will be important for St. Louis Park to partner with a hauler that is experienced in MFH recycling outreach, and perhaps other municipalities with outreach experience.

A pilot program will help St. Louis Park understand the realities of a MFH recycling program, the benefits, costs, successes and challenges. With the information obtained

from the pilot program decisions can be made for the seamless and successful implementation of a MFH recycling program in St. Louis Park.

Conclusion

Through careful consideration and implementation of these recommendations the City of St. Louis Park should experience an increase in recycling rates and participation by its residents in MFH buildings. MFH recycling can be challenging and time consuming, but dedicated city staff, cooperative building managers/owners, cooperative collection haulers, and consistent educational outreach can make MFH recycling a success in the City of St. Louis Park.

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Appendices

- A. Survey Questions for Recycling Program Coordinators.
- B. Multi-Family Housing Property Owner Contact Information and Building Specific Recycling Information.
- C. Annotated Bibliography
 - 1. EPA: Multifamily and High Rise Recycling Assessment
 - 2. Building Multi-Family Recycling Programs in Georgia - EPA Region 4
 - 3. Analysis of Waste Collection Service Arrangements - MPCA
 - 4. Hennepin Recycling Document
 - 5. R.W. Beck MFH Recycling Program Evaluation for Pottstown, Pennsylvania
 - 6. Eureka “Tools for the Voyage” Document
 - 7. Professor Robert Cialdini Study on the Science of Persuasion
- D. City Program Recycling Comparison Spreadsheet.

Appendix A: Survey Questions for Recycling Program Coordinators

1. Could you give me an overview of your current recycling program?
2. Why do you choose to have so many choices in recyclers available for your residents? Why this type of program?
 - 2a. What do you like about your current program?
 - 2b. What do you dislike about your current program?
3. What historical programs have been considered or implemented?
4. What is the penalty for MFH non-compliance in choosing a recycler? Have there been fines issued? Where are the teeth?
5. How are tonnage reports collected? Are they? What have they been? Where can I find them?
6. What types of outreach have been conducted in MFH? Who conducts them? City? Recycler? Manager?
7. What is the median rent?
8. What is the future vision of MFH recycling in this City look like? Has this City considered a mandatory program for MFH?

*Appendix B: Multi-Family Housing Property Owner Contact Information and Building Specific
Recycling Information
(See CD –in the pocket on the back cover)*

Appendix C: Annotated Bibliography

EPA: Multifamily and High Rise Recycling Assessment

EPA. 2001. *Multifamily Recycling- A National Study*. Solid Waste and Emergency Response. 5306W, 1-91.

EPA conducted a survey in 1997, the *Multifamily and High Rise Recycling Assessment*, to all communities that were members of the U.S. Conference of Mayors with populations over 25,000 people. The analysis identified common characteristics of apartment buildings with high waste to recycling diversion rates (>20%) in order to provide recommendations to cities on how to increase diversion rates in MFH establishments. Programs were also evaluated for their efficiency and effectiveness. Efficiency referred to how well recyclables were gathered by collection crews and effectiveness how well local regulations were met through the program. The study identified MFH recycling as important because MFH housing was considered to be “low-hanging fruit” for increasing recycling diversion rates in cities. Though the data may be somewhat dated, the recommendations are applicable in the present day.

Numerous benefits were identified for programs with high-diversion rates. There was a large spread in costs for the programs studied, ranging from \$62 to \$622 per MFH unit (avg. \$177/ton) as compared to single-family units ranging from \$11 to \$420 (avg. \$127/ton). For high diversion programs the average cost dropped from \$177/ton to \$113/ton. In addition refuse collection prices increasing slightly over the average costs for MFH. However, this increase is much less than the savings from lower recycling costs. The study infers that in high-diversion programs waste reduction is also occurring to make up these differences.

The study then identified the common characteristics that the high diversion programs shared. Eighty-two percent of high diversion programs contracted recycling privately or were part of a government program. Sixty-one percent were included on pickups for single-family household recyclable pick up as well. Ninety percent could face sanctions or enforcement by local governments through non-compliance. Eighty-two percent collect a wide variety of recyclable material. 64% of MFH's provide containers that are at least 90 gallons and provide one set of containers per 15-20 households. 63.6% of programs charged a flat monthly fee (usually \$2 or more) to individual units. In general the bill for refuse could fluctuate and thus provided an incentive to maximize recycling and minimize waste.

Building Multi-Family Recycling Programs in Georgia - EPA Region 4

EPA Region 4. 2010. *Building Multi-Family Recycling Programs in Georgia*. Retrieved 31 Oct. 2010 from <<http://www.dca.ga.gov/development/EnvironmentalManagement/programs/downloads/MultiFamRecMult2010.pdf>>.

The *Eureka Recycling Toolkit* and the *Building Multi-Family Recycling Programs in Georgia* are both resources for municipalities to use when developing a multi-family recycling program. The Georgia toolkit provides a step-by-step guide for municipalities and property owners to use when developing their recycling program. The process begins with analysis of the current program, then a discussion on how policy should be utilized, followed by a

demographic understanding of residents and physical understanding of buildings, finally ending with contract and service options, funding and marketing. The toolkit is unbiased and explores all possible options: open, contract, organized, single sort, dual sort, types of recyclables, bin types, city codes, education and signage. The information allows city officials to see how their city fits into different programs and also gives examples from other cities. This toolkit presents the challenges faced by MFH recycling including high turnover, low income, multilingual, convenience and lack of space and anonymity of repercussions and no sense of ownership or relationship with the program. The Georgia toolkit also presents a comprehensive list of information that should be collected as to develop and maintain a successful program. The information that should be tracked includes:

- Building name and address
- Number of buildings and units on site
- Sorting system and hauler
- Any demographic information
- Contact information and history with people at the building. This includes the number of attempts made to work with a manager.
- Outreach history at the building, including the information they have received about recycling
- Quantity and/or quality of materials recycled; an estimate by material type is preferred
- Improvements in the quantity and quality of materials based on outreach efforts
- Other information about the building, such as the length of time a building has sustained a clear and convenient recycling setup
- History of problems including building issues such as contamination or carts blocked by a vehicle, and hauler issues such as a building that was not serviced when scheduled.
- Details about the building layout and trash system (e.g. chutes, dumpsters)
- Number and location of cart sites
- Unit numbering for mailings

This is a comprehensive list that should be tackled from the beginning to the end in order as to develop a better understanding of the public and the program (Bandhauer, et al 2010).

Analysis of Waste Collection Service Arrangements - MPCA

Foth Infrastructure & Environment, LLC. 2009. *Analysis of waste collection service arrangements*. No.08M081. Retrieved on 29 Oct. 2010 from <<http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/waste-management/solid-waste/integrated-solid-waste-management/waste-collection-service-arrangements.html>>.

Analysis of Waste Collection Service Arrangements provides a detailed understanding of the state of organized and open municipal solid waste and recycling across Minnesota and other communities within the United States. This document does not specialize in multi-family housing recycling and only reports two cities that have organized recycling for MFH (St. Paul and Stillwater, MN). They also showcase the costs and benefits for both organized and open hauling. An important issue that SLP will need to address is how haulers will respond to any potential change

in management. Haulers may contact residents directly which may cause conflict over a new program. This study presents an analysis of how residents and haulers may react to a different program.

Hennepin Recycling Document

Hennepin County, MN. 2010. *Waste Abatement Incentive Fund*. Retrieved 20 Nov. 2010 from <<http://hennepin.us/portal/site/HennepinUS/menuitem.b1ab75471750e40fa01dfb47ccf06498/?vgvnexto=a6bb653bdb573210VgnVCM10000049114689RCRD>>.

St. Louis Park and Minnetonka have several differences in their waste management and recycling programs. St. Louis Park contracts with several haulers to collect both its waste and recyclables. Collection service is provided to all single-family residences as well as multifamily residential buildings of four units or less. The recycling program is a dual-stream system, with paper sorted into one bin and rigid containers to another one. In Minnetonka, the city has organized collection for recyclables, but waste collection services are contracted by individual household. The recycling program is single-stream, where everything is placed into one bin and is mechanically sorted by the hauler. Some also participate in source-separated organic program (SSO), by sorting the compostable organic from waste.

The overall recycling rates in both cities appear to be achieving a high level of success. In Minnetonka, households participating in SSO collection programs appear to be more motivated in recycling effort. In a nutshell, other than further education and outreach should be made to increase recycling rates in both cities, SSO program is suggested to be implemented in both of these cities which organic being over 40% of the content of waste carts. (Tim Goodman & Associates, 2009)

R.W. Beck MFH Recycling Program Evaluation for Pottstown, Pennsylvania

R.W. Beck. 2010. *Advancing the Business of Infrastructure*. Retrieved 1 Nov. 2010 from <<http://www.rwbeck.com/>>.

R.W. Beck is a Science Applications International Corporation (SAIC) company, comprised of technically based business consultants serving public and private infrastructure organizations and financiers worldwide (R.W. Beck, 2010). In 2008, R.W. Beck submitted a final report entitled *Multi-Family Recycling Program Evaluation* to the Borough of Pottstown, PA. This report explained the findings and recommendations R.W. Beck had for improvement of the Borough of Pottstown's MFH recycling program. The findings and recommendations useful for the City of St. Louis Park are discussed below:

Like St. Louis Park, Pottstown was also seeking assistance to increase participation in recycling at MFH locations. The recycling program structure is similar in both St. Louis Park and Pottstown. Both cities had recycling for single family housing contracted through a single hauler but let MFH property owners or managers choose their own hauler. R.W. Beck conducted their study by going to six randomly selected apartment complexes and examining the recycling stream and the structure of the recycling collection service at each building. They found that signs were unclear and inconsistent, types of collection bins were inadequate, and as a result material in the bins was not sorted

correctly or had garbage mixed in. In evaluation of the tonnage reporting system, R.W. Beck found that it was impossible to determine what recycling rates were for MFH (Chamberlain, 2008). This was due to the fact that often, large apartment buildings were lumped into the commercial tonnage report with actual businesses and that reporting from MFH owners or managers was not enforced. (See Tables for a list of problems and recommendation).

Pottstown, PA and St. Louis Park, MN Problem Comparison

Problems in Pottstown, PA	Similar Problem in St. Louis Park?
<i>Site Issues</i>	
Limited outside space for containers	Yes
Limited dwelling unit-space for containers	Yes
Inconvenience for residents to delivery recyclables to central area	Yes
<i>Ordinance and Oversight Issues</i>	
Recycling ordinances enforced less frequently than other ordinances	Yes
Less enforcement because MFH is not included in the SFH contract	Yes
Limited city staff time	Yes
<i>Education and Outreach Issues</i>	
High resident turnover	Yes
High building manager turnover	Yes
Lack of incentive/accountability for managers or owners to conduct education/outreach	Yes
Language barriers	Yes
Lack of incentive/accountability for residents to recycle	Yes

Recommendations from RW Beck's Recycling Program Review for Pottstown, PA

Recommendations for Pottstown	Applicable to St. Louis Park?
Inventory type and location of all Recycling containers at each building	Yes
Provide small containers or totes to each unit	Yes
Discuss with building managers the possibility of having recycling collection areas on each floor	Yes
Develop brochures and pamphlets about recycling exclusively for MFH residents	Yes
Send letters to building managers or owners the need to comply with ordinances regarding MFH recycling	Yes
Create a database of MFH Building managers and contact them yearly about any recycling issues	Yes
Set up meeting with city staff, recyclers, managers/owners, and condo representatives to discuss successes and failures	Yes
Enforce ordinances to collect recyclables and submit tonnage reports specifically for MFH	Yes
Consider including MFH in with the SFH contracted program	Yes
Use pictures on recycling bins to assist Non-English speaking residents and children	Yes
Add information on the city website specifically for MFH	Yes
Purchase and distribute promotional items such as magnets that can be seen over and over again by residents	Yes

Eureka “Tools for the Voyage” Document

Eureka Recycling. 2004. *Exploring Multifamily Recycling*. Minneapolis: Impressive Print. 1-54

In 2002, the State Auditor’s report, “Recycling and Waste Reduction” identified multi-family recycling as a key opportunity to increase recycling and called for the Minnesota Office of Environmental Assistance (OEA) to “gather, synthesize and communicate research results on effective recycling and waste reduction practices.” The OEA charged Eureka Recycling, a Minnesota-based non-profit organization with a focus on zero-waste, to begin this work. Based on 15 years of experience with multi-family housing recycling, Eureka constructed a ‘toolkit’ entitled, “ Exploring Multifamily Recycling-Tools for the Voyage”, specifying best practices for multi-family housing recycling to ensure greater participation rates among multi-family residents.

Based on this report, the key to the success of multi-family recycling programs lies in the foundation of such programs. Eureka identifies the program design, information systems and basic recycling structure as three important elements of the foundation. Program design includes whether the city has an open hauling system, contract (city-wide) or franchise program. Information systems refer to data collection for each multi-family unit, including collecting tonnage information. Basic recycling structure refers to the location, condition and labeling of recycling carts at each building. Each of these foundational elements is linked to and addresses the challenges that exist within multi-family recycling programs.

One characteristic of multifamily recycling programs is that every program operates within a legal framework that determines its design. The challenge is to understand how the legal structure helps or hinders the success of the program. To do this, one must examine the ordinances, contracts or franchises that apply to the specific program. One characteristic of multifamily dwellings that relates to the need for information systems is that the properties include a wide range of building sizes and types. The challenge is to determine which buildings will benefit most from increased attention. Tracking the amount of material that each building sets out for recycling allows recycling coordinators to gauge and identify which buildings they need to concentrate their efforts on. Key information to track includes the quantity and quality of materials recycled, improvements in the quantity/quality of materials based on education outreach efforts, and history of problems with the building.

One characteristic of multi-family recycling structure is that every building requires a different setup because each building is different. The challenge arises when containers are placed without thought to the residents' convenience and are not completely differentiated from trash containers. Things to consider in addressing these challenges include placing the recycling carts in a consistent and convenient location as well as labeling the carts and providing signage around the carts. Making the recycling carts at least as convenient, if not more convenient, than the trash dumpster is crucial to attain a high level of participation. Good labels and signage around the general recycling area allows for minimal contamination of the recycling carts because people then understand their purpose.

Once these foundational elements are in place, recycling coordinators can then focus on education and outreach, and finally individual building challenges.

Professor Robert Cialdini Study on the Science of Persuasion

Cialdini, Robert. 2010. *Luncheon Keynote Speech – Carlson on Sustainability Conference*. Carlson School of Management. Minneapolis, MN. 22 Oct. 2010.

Two of the studies he conducted looked at how two different groups of people in two different situations responded to the same set of persuasive techniques trying to get them to do an action. The first was a study that attempted to persuade residents in San Marcos, CA to use less energy. Residents in some neighborhoods were given pamphlets saying they should use less energy because it helps the environment, some said it would save them money, and other

pamphlets told residents that their neighbors are using less energy than they are (Cialdini, 2010). The results showed that residents reduced their electricity consumption much more when they were told that their neighbors were using less than they were (Cialdini, 2010). In his second study he used the same persuasive techniques to try to get hotel guests to reuse their towels. When people were told that x% of guests in their exact same hotel room reused their towels, reuse of towels was much higher than the other two persuasive techniques (Cialdini, 2010).

*Appendix D: City Program Recycling Comparison Spreadsheet
(See CD –in the pocket on the back cover)*