BURNS McDONNELL

CARVER COUNTY, MN

HOUSEHOLD HAZARDOUS WASTE, PROBLEM MATERIALS, AND RECYCLING PROGRAM

FUTURE SERVICES AND FACILITY PLAN

FUTURE SERVICES AND FACILITY PLAN

PROJECT NO. 159563

REV 1

MARCH 15, 2024

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List of Abbreviations

Abbreviation	Term/Phrase/Name
Burns & McDonnell	Burns & McDonnell Engineering Company, Ins
County	Carver County
DDR	Damaged, Defective, and Recalled
EC	Environmental Center
GIS	Geographic Information System
HHW	Household Hazardous Waste
IBC	Intermediate Bulk Containers
Plan	Future Service and Facility Plan
Program	Carver County Household Hazardous Waste, Problem Material, and Recycling Program
NYA	Norwood Young America
VSQG	Very Small Quantity Generator

Executive Summary

The Carver County (County) Environmental Services Department operates a robust Household Hazardous Waste (HHW), Problem Material, and Recycling Program (Program) which includes the operation of the Environmental Center located at 116 Peavey Circle in Chaska, Minnesota, three annual collection events in the western part of the County, and four satellite collection facilities in partnership with host communities. The County is a rapidly growing suburb of Minneapolis and the fastest growing county in the state. The Environmental Center facility was established in 2002 and has experienced a substantial increase in participation, volume, and complexity of collected materials over the last 20 years. This has created storage constraints, safety challenges, and traffic congestion, leading to the facility exceeding its maximum operational capacity. This Future Services and Facility Plan (Plan) characterizes the current Program, evaluates options, and provide recommendations for the future.

Goals & Objectives

The goals and objectives of this Plan include the following:

- Establish a vision for the future of the County HHW, Problem Materials, and Recycling Program over the next 10-year horizon.
- Maximize the useful life of the current Environmental Center.
- Improve traffic to minimize backups and congestion.
- Evaluate location options based on population growth and projected participation in the Program.
- Evaluate comingled recyclables diversion options for the public and the impact of discontinuing the material at the Environmental Center.
- Continue the delivery of high-value, timely customer service.
- Plan for the delivery of services and capital expenditures to ensure financial stewardship.

Participation and Projection

The Environmental Center participation and material quantities continue to increase annually at a rate that exceeds population growth. The County can anticipate this trend to continue and experience participation and material quantity increases as much as double from current amounts by 2040. The Environmental Center is already exceeding capacity in terms of customer traffic and material storage. Participation and material quantities at mobile events has remained relatively consistent at each location based on the available data demonstrating that current frequency of offerings is meeting demand. The Satellite Collection Facilities accept a limited diversity of materials. The material quantities collected at the Satellite Collection Facilities over the past three years has remained relatively consistent, indicating that the current service offerings are meeting demand for service.

Location Analysis

The Environmental Center is located in the densely populated portion of the County. The population of County residents living within a 5-mile radius of the Environmental Center is 63

percent and increases to 77 percent within a 10-mile radius. The population center of the County is located just west of the Environmental Center by about four miles and the geographical center is located even further west, just south of Waconia. Projected population growth for each City/Township in the County indicates that growth will occur in the eastern portion where the Environmental Center is located. It is possible for the Environmental Center to continue to serve the community at its current location and size with several operational and site improvements. The current service offerings in the western portion of the County are meeting the demands of the population.

Recycling Program Evaluation

Most single family and multifamily residents in the County have convenient access to recycling through curbside or onsite collection, respectively. Participation in these programs is high. There are also drop-off options for recyclables throughout the County. While the County's service offering of recyclables collection at the Environmental Center is popular, it presents challenges such as traffic congestion, safety, and staff resources. Discontinuing the collection of recyclables at the Environmental Center would relieve some immediate spatial constraints, traffic congestion, and provide staff with additional time to dedicate to more hazardous or problem materials. The County should consider additional options to recycling such as additional community drop off locations or increased access to curbside services through a County code change to include all County residents, not exclusive to municipalities.

Environmental Center Operations Analysis

The County Environmental Center is a well-operated facility that provides an overall safe, efficient, and effective service to its customers. An onsite analysis of operations by industry specialists identified the following operational improvements in the areas of indoor air quality and fire safety:

- Eliminate the indoor overnight storage of lithium-ion batteries and instead store Li batteries in a prefabricated 2-hr fire rated structure outdoors.
- Standardize the practice of packing lab pack items under the ventilation hood.
- Install a ventilation hood at the flammable liquid bulking workstation.
- Standardize the practice of moving full flammable liquid drums to the outdoor storage area and not stored in the flammable bulking room in excess of 240 gallons (4 55-gallon drums) or overnight per the building codes and fire department.

Environmental Center Capacity Analysis

The industry recommended planning level size for an HHW building for populations of 100,000 to 250,000 is between 10,500 and 14,000 square feet.[1] This recommend building size is for the collection and handling of HHW materials and does not account for problem materials; additional space is needed to accommodate these waste streams. The current facility has a 10,095 square feet footprint and is just below the recommended range for managing the traditional HHW waste stream. Additionally, the facility manages E-waste inside the building that demands significant storage space. The current Environmental Center meets

[1] https://wasteadvantagemag.com/six-of-the-most-forgotten-features-at-hhw-collection-facilities-part-1/

the minimum recommended industry standard size for managing HHW materials. Increasing exterior storage for E-waste with a trailer will ease interior spatial constraints.

Traffic congestion at the Environmental Center is the most restrictive capacity challenge. When customers enter the site, they are directed to enter on the left side of the road. Customers self-service recyclable materials in the area at the back of the facility. The recycling area can become congested and does not have any clear marked vehicle directional pavement markings. Customers maneuver in all different directions and often reverse their vehicles creating an unsafe environment for both vehicles and pedestrians. Vehicle turning space is limited and can present potential conflict paths while accessing the various drop off materials and in turning around to exit the property. Reducing customer traffic and improving traffic patterns is critical to remaining in the current facility into the future.

The need for a second satellite facility was evaluated and it was concluded that there is not a foreseen demand to support an additional facility. The population of the County is estimated at around 161,000 residents by 2040. A single facility, appropriately sized, is adequate to serve a community with a population of up to 250,000. Additionally, the County is not experiencing increased participation at mobile collection events or satellite facilities, which is typically a strong indicator of the need for a second facility. The current Environmental Center could continue to serve the community with operational and site improvements.

Future Options Analysis

The County is at a crossroads with an aging facility that is operating at its maximum capacity and considering options for the future of the Program. Several option combinations were considered in the development of this Plan and discussed with County staff. The following six options were evaluated for consideration.

1. Stay in current facility and maintain current service offerings (status quo).
2. Stay in current facility, prioritize hazardous materials collection, and make operational and site improvements.
3. Develop a new facility to replace the existing facility.
4. Implement Option 2 and add a second facility.
5. Implement Option 2 and host additional events.
6. Implement Option 2 and expand service offerings at satellite locations.

Three options were identified by County staff for further evaluation and consideration including options 2, 3, and 5. A summary of the rough order of magnitude (ROM) cost estimate (+/-50%) is presented in Table ES 1. More detail related to these options and associated assumptions is provided in Section 7.0.

Table ES 1: ROM Cost Estimate of Options in Consideration

Option	ROM Cost Estimate
Stay in current facility, prioritize hazardous materials collection, and make operational and site improvements.	$423,000
Develop a new facility to replace the existing facility.	$10,010,000
Host additional events.	$15,000 (per event)

Partnership Opportunities and Engagement

The County has an agreement with its neighboring counties, Hennepin, McLeod, and Scott Counties, to accept materials from each other's residents. Therefore, if a Carver County resident resides in closer proximity to a Hennepin, McLeod, or Scott County drop-off facility, the resident can drop-off materials at these facilities. This collaboration provides flexibility for residents and expanded service area coverage. The respective programs identify the specific county of origin for each customer and then invoices the respective county for the applicable costs associated with HHW material management. This type of collaboration expands service to those residents residing close to county boundaries.

Future Services and Facility Plan

It is recommended that the County maximize its ability to occupy the current Environmental Center for the next three to five years, as long as participation demand and material quantities accepted allows. The following actions are recommended to maintain safe and efficient operations in the current location.

- Discontinue acceptance of commingled recyclable materials which do not meet the definition of hazardous materials at the Environmental Center. Eliminating recyclable collection would reduce the total daily participants by as much as 26 percent and ease current traffic challenges. It would also free space, allow for placement of semi-trailer/s for the storage of E-waste, and result in cost savings associated with disposal costs for that material stream. Consider additional options to recycling such as additional community drop off locations or increased access to curbside services.

- Improve traffic by entering on the "correct" side of the road, widening the road at the entrance, adding a point of service kiosk, and dedicated lanes for material types. Widening the road will allow vehicles to enter on the right side of the road and avoid blocking parking spaces during longer queue lengths. A service kiosk near the operations canopy will streamline customer interaction as well as allow staff to move between the kiosk and operations area efficiently. Dedicated lanes will direct customers with self-service material types to bypass the queue.

- Implement an appointment system to stagger participation throughout the day and limit high-volume occurrences. The appointment system could be exempt for certain material types that are more self-service such as food waste.

It is also recommended that the County host one additional mobile event in the western portion of the County to monitor the participation impacts and evaluate the demand for this service.

Explore the need for a new facility in three to five years after the recommendations have been implemented. A new facility would not be imminent with the recommended improvements to the current facility; however, space constraints will continue to be pressing overtime as participation and material quantities handled continues to increase. A new facility should be considered as the County evaluates capital improvement investments especially as the current facility requires maintenance, repairs, and upgrades.

1.0 Introduction

The Carver County (County) Environmental Services Department operates a robust Household Hazardous Waste (HHW), Problem Material, and Recycling Program (Program) which includes the operation of the Environmental Center in the eastern part of the County, three annual collection events in the western part of the County, and four satellite collection facilities. The Environmental Center, located at 116 Peavey Circle in Chaska, Minnesota, operates year-round, and collects and manages HHW, problem materials, and commingled recycling from community residents and businesses. The collection events provide for a single day collection of HHW and problem materials. The satellite facilities operate year-round in partnership with the communities of Cologne, Mayer, Norwood Young America (NYA), Waconia, and Chanhassen and offer a limited material collection.

The County is located in the Twin Cities Metropolitan Area (TCMA) and is one of the fastest growing counties in the state. The Environmental Center facility was established in 2002 and has experienced a substantial increase in participation, volume, and complexity of collected materials over the last 20 years. This has created storage constraints, safety challenges, and traffic congestion, leading to the facility exceeding its maximum operational capacity. The County retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to develop a Future Services and Facility Plan (Plan) which characterizes the current Program, evaluates options, and provides recommendations for the future of the Program.

1.1 Purpose

The purpose of the Plan is to establish a vision for the future of the County Program that maintains service levels in the eastern portion of the County as well as in the central and western portions. The Plan characterizes the current program, evaluates multiple service models, and provides recommendations.

1.2 Goals & Objectives

The goals and objectives of this Plan, as discussed during the project kick-off meeting include the following:

- Establish a vision for the future of the County HHW, Problem Materials, and Recycling Program.
- Maximize the useful life of the current Environmental Center.
- Improve traffic to minimize backups and congestion.
- Evaluate location options based on population growth and projected participation in the Program.
- Evaluate comingled recyclables diversion options for the public and the impact of discontinuing the material at the Environmental Center.

1.3 Definitions

This section presents definitions of a selection of key terms used throughout the Plan that are necessary for a comprehensive understanding of the current management systems and strategies that may be implemented in the future.

- **Comingled Recyclables**. Materials that are typically accepted through municipal curbside recycling programs or drop-off locations, processed through material recovery facilities, and sold as commodities to markets where the material is then repurposed. Comingled recyclables include items such as, but are not limited to, plastic containers, aluminum and steel cans, cardboard, glass containers, and other various paper products.
- **Corrugated Cardboard**. Source separated corrugated cardboard boxes.

- **Household Hazardous Waste.** HHW refers to common household chemicals or other materials that should not be disposed of in MSW landfills due to their potential for adverse environmental and health impacts. They require special processing by an entity permitted by the State. HHW includes, but is not limited to, materials such as paints, fertilizers, pesticides and poisons, pool chemicals, household cleaners, automotive fluids, batteries, light bulbs, and E-waste, freon containing appliances, and sharps.
- **Problem Materials.** Materials that can be recycled or repurposed but require separate collection and management. Problem materials accepted at the Environmental Center include scrap metal, food waste, mattresses, appliances (non-freon containing), car seats, tires, plastic bags, and film.
- **Recyclables.** This refers to both comingled recyclables and corrugated cardboard interchangeably.

2.0 Participation and Projection Analysis

Planning for the County's HHW program's future needs requires an understanding of the historical and projected growth that will impact the participation in the program and the corresponding quantities of materials managed through the program. This Plan utilized historical data to calculate projections for participation and materials generation through 2040. Population will largely determine the level of growth in program participation. This section develops a long-range forecast of projected participation, service demands, and material generation for the HHW Program.

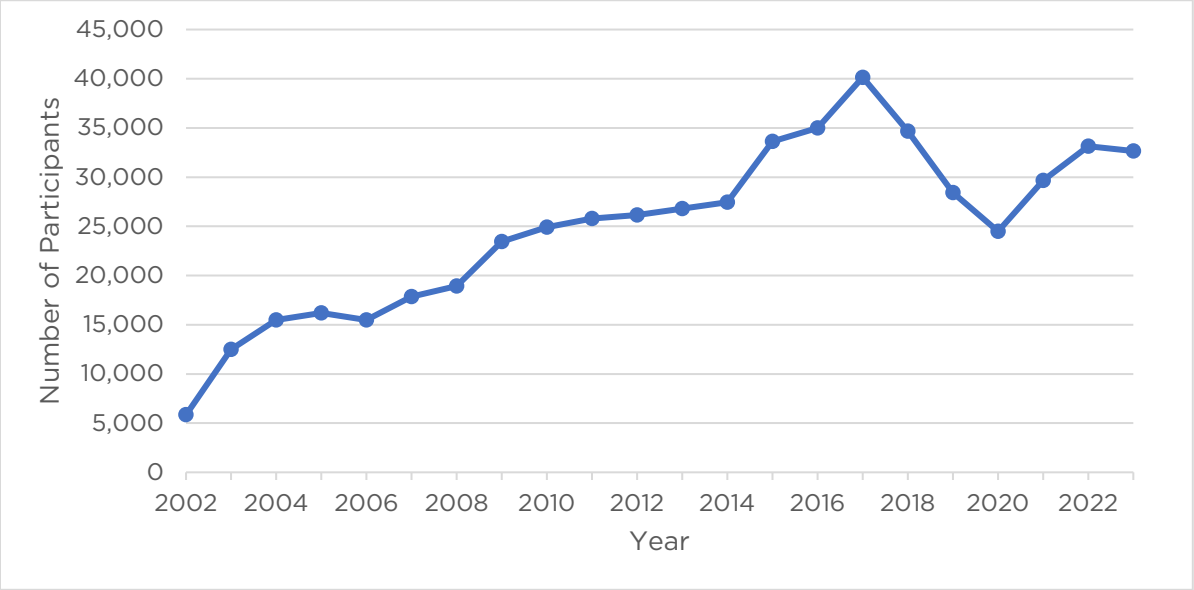
2.1 Historical Participation

The County tracks metrics on the participation and material management at the Environmental Center, mobile events, and the satellite collection facilities and compiles reports on an annual basis. This section summarizes a review of the data provided by the County and used to identify trends in historical participation and material management from 2002 through 2023. Historical participation data for the Environmental Center and mobile collection events are provided in the following sections.

2.1.1 Environmental Center

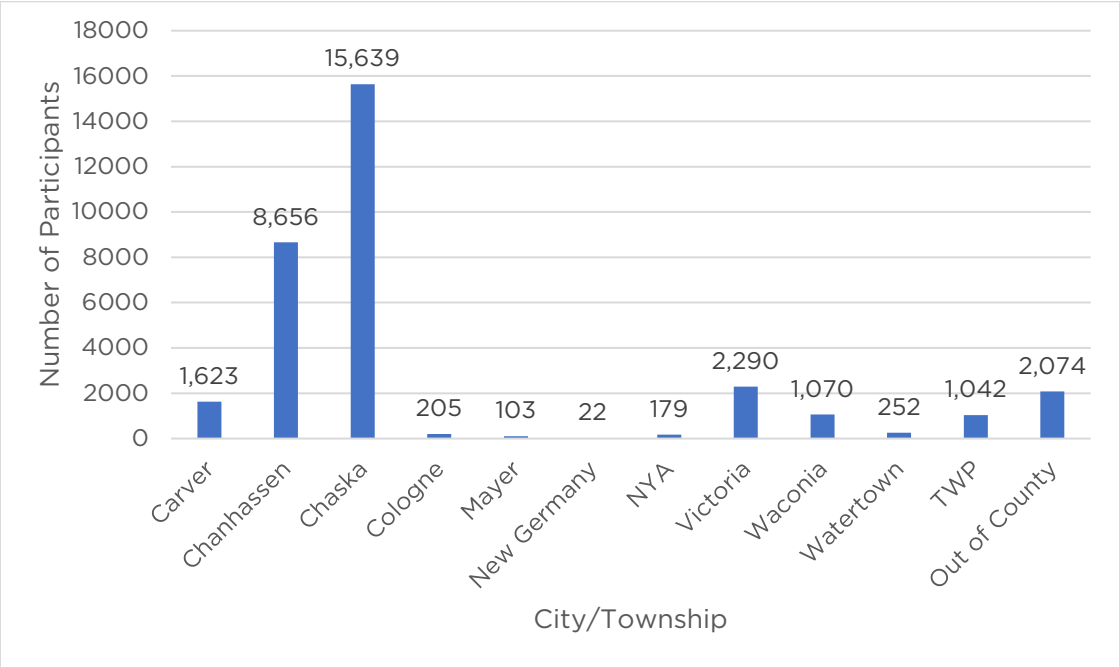
In 2022, the Environmental Center hosted approximately 33,000 participants. Historical participation at the Environmental Center has increased year after year, except for years 2018 through 2020 due to the County's end to yard waste collection as well as the coronavirus pandemic in 2020. Figure 2-1 shows the annual trend of Environmental Center participation from 2002 to 2023. The peak year was 2017 in which the Environmental Center saw approximately 40,000 participants.

Figure 2-1: Trend of Annual Environmental Center Participation



In 2022, most Environmental Center participants were Chaska and Chanhassen residents, as shown in Figure 2-2 below.

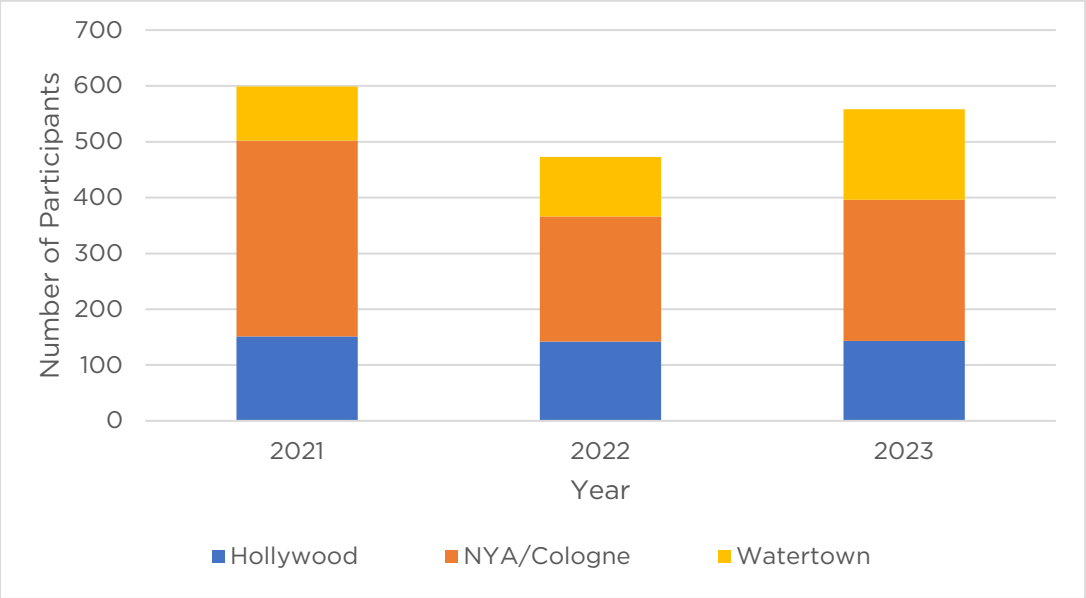
Figure 2-2: Environmental Center Participation in 2022



2.1.2 Mobile Events

The County has historically hosted three annual mobile events in the western part of the County in partnership with the communities of NYA Watertown and Hollywood Township. A review of the participation data was conducted over the past three years. Between 2021 and 2023, each of the three annual mobile events hosted an average of 181 participants. Historical participation at mobile events has remained relatively steady. Figure 2-3 shows the annual trends of mobile event participation by event from 2021 to 2023. The NYA event was the most well attended event during 2021, 2022, and 2023 and accounted for approximately 50% of annual mobile event participants.

Figure 2-3: Trend of Annual Mobile Event Participation[1]



[1]The NYA/Cologne event typically occurs in NYA but was temporarily relocated to Cologne in 2023.

2.1.3 Participation Trends

The average year-over-year participation increase from 2002 – 2023 for Environmental Center participants was estimated at 9.0 percent. To understand potential impacts of the coronavirus pandemic on participation as well as the change to yard waste collection services post-2018, the average year-over-year participation increase from 2002 – 2018 was also calculated and was found to be slightly higher at 9.3 percent. Historical participation trends were not calculated for mobile events or satellite collection facilities due to the limited range of historical data provided.

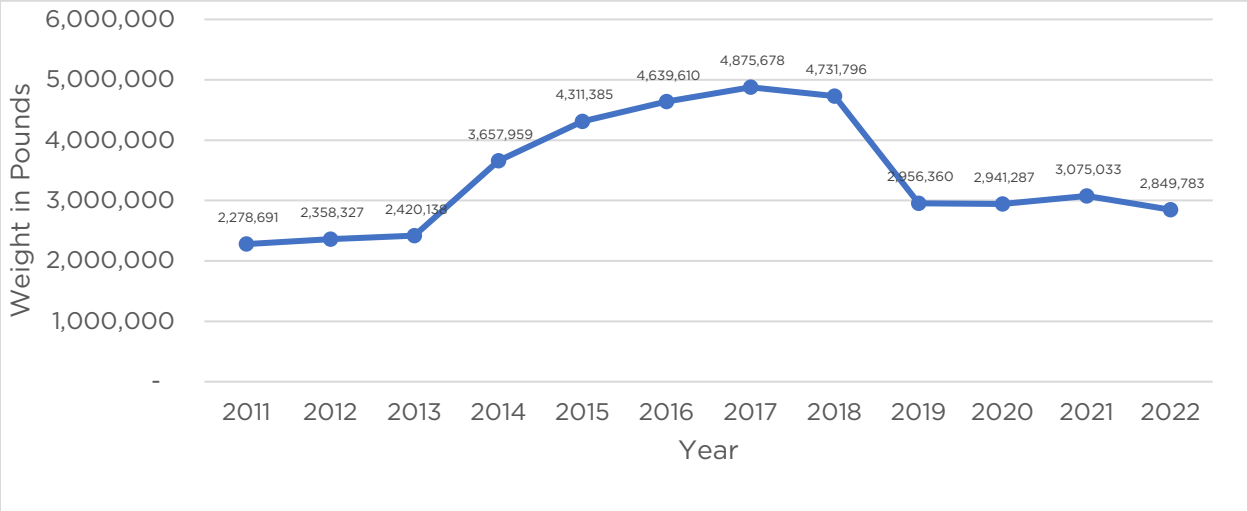
2.2 Historical Material Collection Quantity

The Environmental Center, mobile events, and satellite collection facilities all collect a variety of HHW and problem of materials. Annual material quantities for each collection center are provided in the following sections. All historical material collection quantities are tracked in pounds.

2.2.1 Environmental Center

The Environmental Center collects HHW, E-waste, appliances, scrap metal, mattresses, food waste, tires, commingled recyclables, and other materials. Historical material collection at the Environmental Center has seen a steady increase, with the exception of years post-2018. This is likely due to the County ceasing collection of yard waste, as well as staffing shortages and unprecedented vehicle traffic that led to an underestimation of tracked material quantities. Figure 2-4 shows the annual trend of Environmental Center material generation from 2011 to 2022.

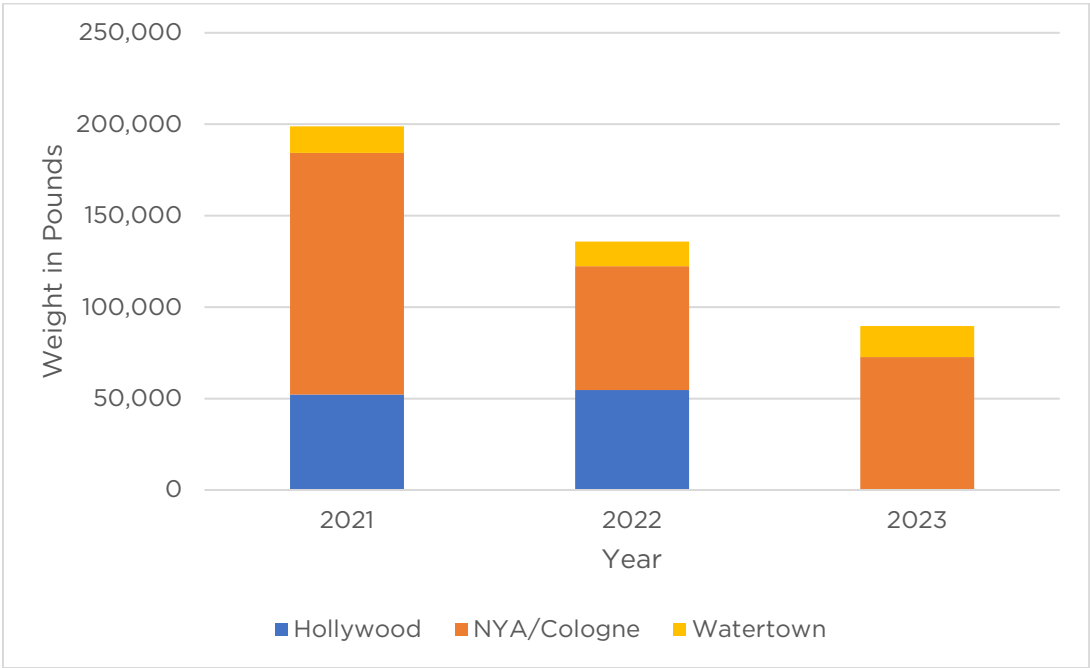
Figure 2-4: Trend of Annual Environmental Center Material Quantities



2.2.2 Mobile Events

The County offers collection of HHW and problem materials at a series of mobile events throughout the year. Figure 2-5 displays the annual trend of mobile event material generation from 2021 to 2023. As previously noted, there is an additional mobile event that is yet to occur in the fall of 2023. Historical material collection at mobile events will likely remain relatively steady, as they are well utilized throughout the County.

Figure 2-5: Trend of Annual Mobile Event Material Quantities[1]

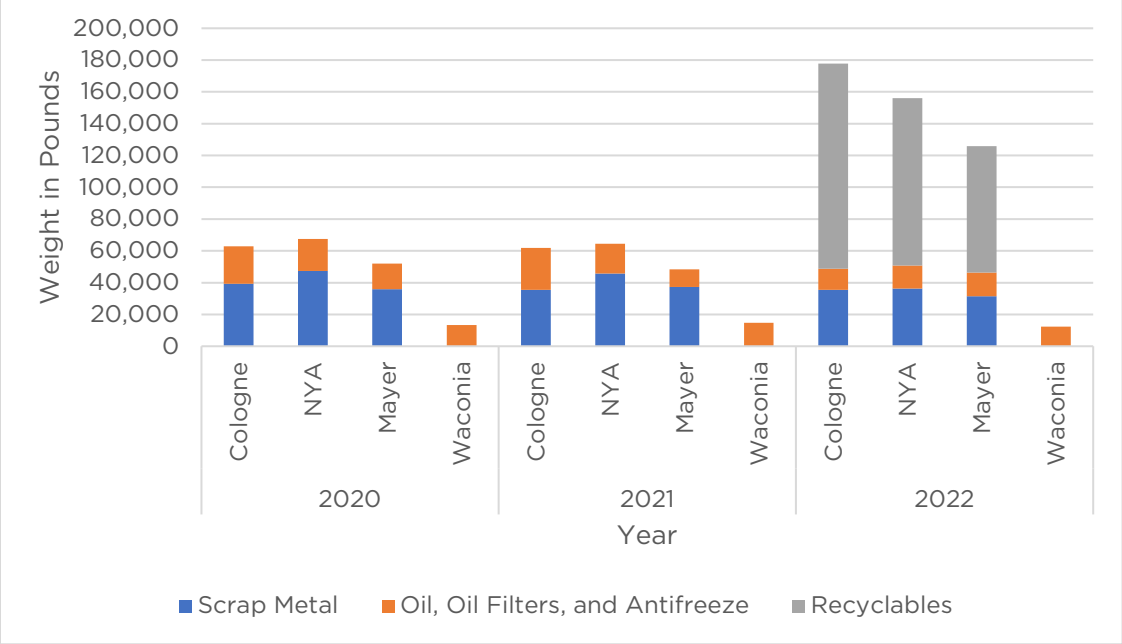


[1]The NYA/Cologne spring event typically occurs in NYA but was temporarily relocated to Cologne in 2023.
[2]The Watertown event collects HHW only.

2.2.3 Satellite Collection Facilities

The satellite collection facilities accept recyclables, scrap metal, and select HHW materials including oil, oil filters, and antifreeze. Figure 2-6 shows the annual trend of satellite collection facility material generation from 2020 to 2022. A majority of the materials collected come from the Cologne, NYA, and Mayer facilities, with a minimal amount coming from the Waconia facility. Commingled recycling tracking began in 2022, which explains the significantly higher quantities of materials shown in 2022 for all facilities.

Figure 2-6: Trend of Annual Satellite Collection Facility Material Quantities



2.2.4 Historical Material Collection Quantity Trends

The material collection quantity trend over the past decade has been a steady increase, except for the year following the end of yard waste collection in 2018 which showed a significant drop. The average year-over-year increase in material received from 2011 – 2023 through the Environmental Center was calculated to be 1.9 percent. To understand potential impacts of the coronavirus pandemic as well as the end of yard waste collection post-2018, the average year-over-year participation increase from 2011 – 2018 was also calculated and was found to be higher at 11.0 percent which more accurately depicts the trend. Historical material collection quantity trends were not calculated for mobile events or satellite collection facilities due to the limited range of historical data provided.

2.3 Material Composition

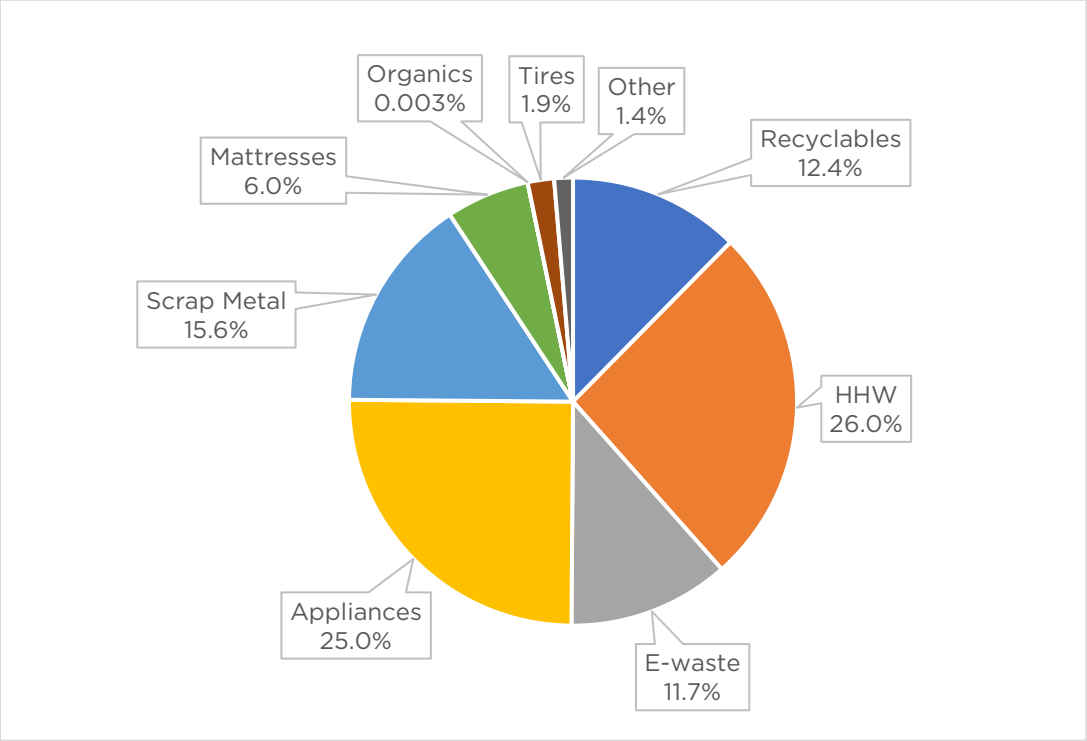
The composition of materials collected at the Environmental Center and mobile events is tracked on an annual basis. Material composition data for the mobile events was not available.

Percent composition for each collection area is provided by weight, except for the Environmental Center which includes composition by both weight and transaction frequency.

2.3.1 Environmental Center

Materials collected at the Environmental Center are tracked by both weight and transaction frequency. In 2022, materials by weight consisted of HHW at 26.0 percent, followed by appliances[2] at 25.0 percent, scrap metal at 15.6 percent, recyclables at 12.4 percent, E-waste at 11.7 percent, and mattresses[3] at 6.0 percent. Figure 2-7 illustrates material types disposed of by weight in 2022.

Figure 2-7: Material Types Disposed of by Weight at the Environmental Center in 2022[1]



[1]Other includes plastic film and yard waste.

In addition to analyzing material composition by weight, material composition was also analyzed by frequency of occurrence within each transaction. Customer transactions at the Environmental Center are tracked and recorded by staff. Included in each transaction recording is documentation of the material type(s) dropped off. Between 2021 and 2023, there was an average of 33,000 participants with 44,600 material type transactions. Note that most customers had multiple material types within their transaction, therefore the number of material occurrence transactions exceeds the number of participants. Table 2-1 provides the material types composing these material occurrence transactions. Percentages are given by frequency of material type occurrence in each transaction.

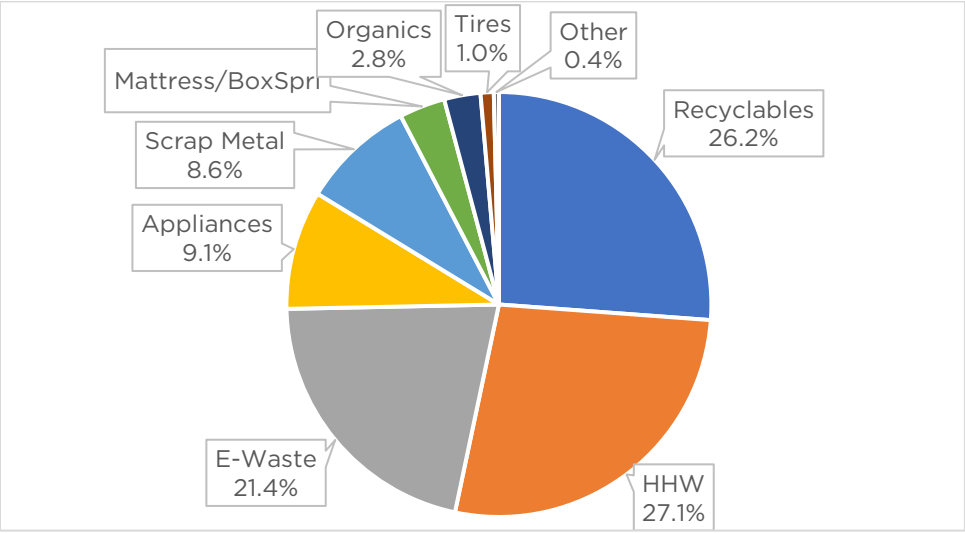
[2] Appliances converted from count to lbs using volume conversion factor provided by the EPA and assuming an average of each major appliance.
[3] Mattresses converted from pieces to lbs using average of 100 lbs/mattress

Table 2-1: Environmental Center Transaction Material Type Percentages

Material Type	2021	2022
Recyclables	22.6%	26.2%
HHW	28.2%	27.1%
E-waste	23.3%	21.4%
Appliances	9.8%	9.1%
Scrap Metal	8.0%	8.6%
Mattress/Box Spring	3.9%	3.5%
Food Waste	2.7%	2.8%
Tires	1.2%	1.0%
Other	0.3%	0.4%

Recyclables, HHW, and E-waste are the most frequently occurring material types in customer transactions in 2021 and 2022. Transactions by material type have remained relatively consistent from 2021 to 2022. Figure 2-10 provides the material types composing the transactions in 2022. Percentages are given by frequency of material type occurrence in each transaction.

Figure 2-8: Material Types Disposed of by Transaction Frequency at the Environmental Center in 2022

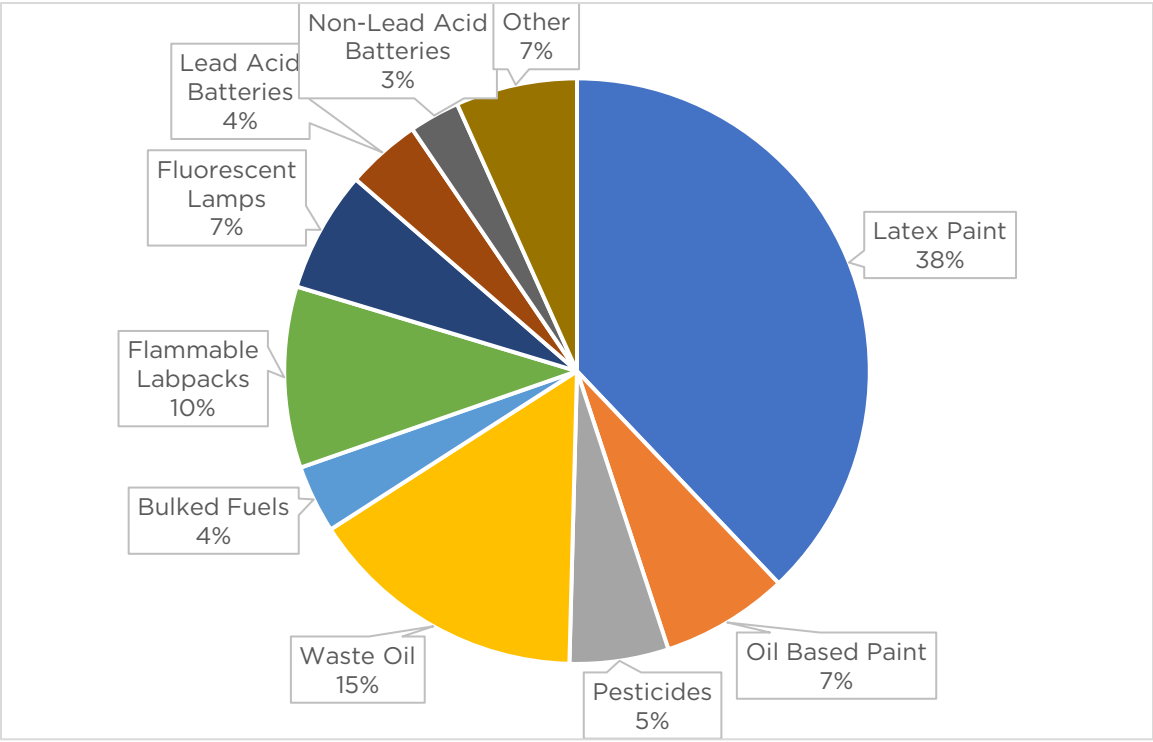


There are notable differences between the material types disposed of by weight versus transaction frequency at the Environmental Center. While appliances and scrap metal compose about 40% of material types by weight, they make up only 18% of all transactions. This can be attributed to the greater weight of these materials. Conversely, while recyclables compose only 12% of material types by weight, they make up 26% of all transactions. E-waste also composes only 12% of material types by weight but makes up 21% of all transactions. The

significant difference of these percent compositions highlights the importance of understanding composition by both weight and transaction frequency.

The Environmental Center collects a variety of HHW materials. Figure 2-8 illustrates the total HHW disposed of by specific material type by weight in 2022. Most of the HHW collected at the Environmental Center in 2022 consisted of latex paint at 41 percent, followed by waste oil at 17 percent, flammable lab packs at 11 percent, oil-based paint at 8 percent, and fluorescent lamps at 7 percent.

Figure 2-9: HHW Material Types Disposed of by Weight at the Environmental Center in 2022[1]

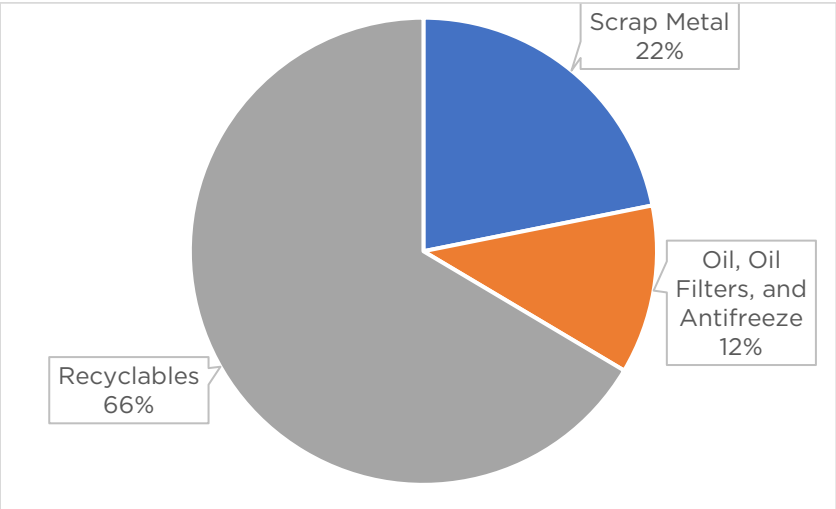


[1]Other includes aerosols, oil filters, cooking oil, antifreeze, acids, bases, cylinders, ballasts, driveway sealer, and mercury.

2.3.2 Satellite Collection Facilities

Materials collected at the satellite collection facilities are tracked by weight. In 2022, the materials collected primarily consisted of recyclables at 66 percent, followed by scrap metal at 22 percent, and used oil, oil filters, and antifreeze at 12 percent. Figure 2-9 illustrates the total materials disposed of by type in 2022 at the satellite collection facilities.

Figure 2-10: Material Types Disposed of by Weight at the Satellite Collection Facilities in 2022



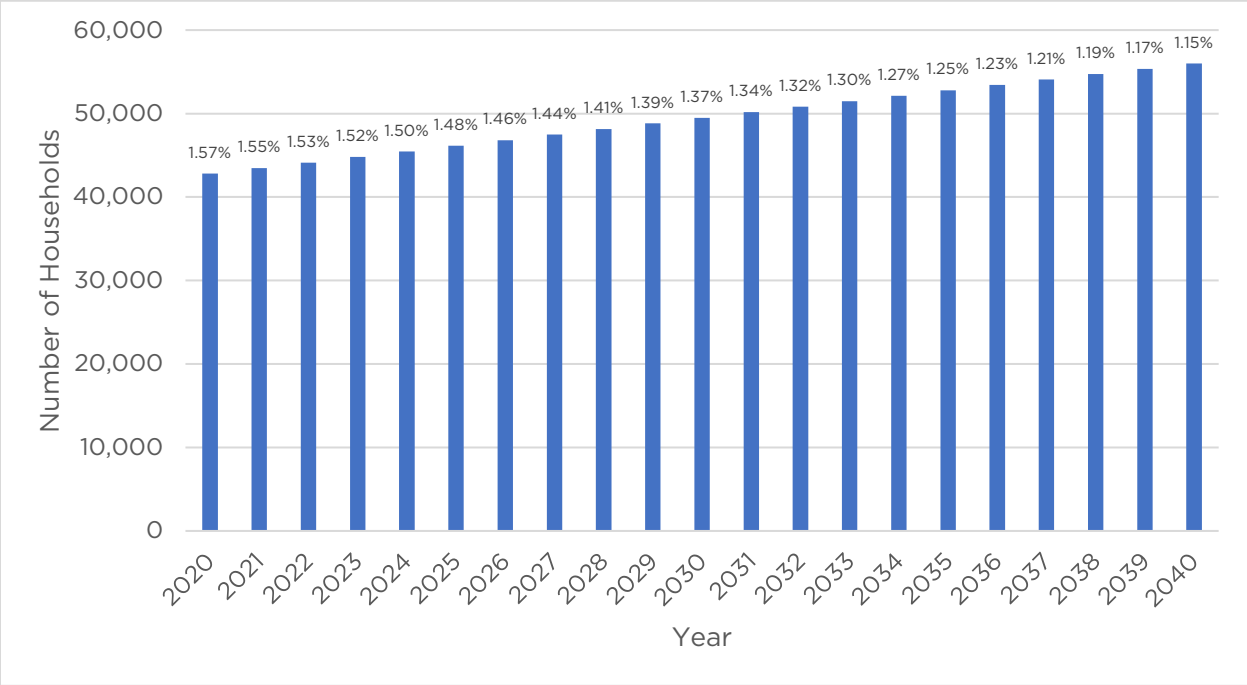
2.4 Participation Projections

The intent of this Plan is to develop a long-range forecast of participation and material management for the County HHW program. This section estimates the projected participation at the Environmental Center.

2.4.1 Population Projections by Household

The projected participation at the Environmental Center is based on household growth and historical participation trends. The County HHW program serves 10 townships and 11 cities in Carver County. Participation is tracked in vehicle counts which are assumed to translate to a single household, therefore future program participation is projected based on household data. Data from the State of Minnesota Demographics Center was used to identify the number of households in the County and determine the average annual household growth across a 20-year period. Figure 2-11 illustrates the annual forecasted growth in the County from 2020 to 2040, including the annual percent change for each year. The household count is anticipated to increase from around 45,000 to nearly 56,000 by 2040, and the population is anticipated to increase from 112,000 to nearly 140,000 by 2040.

Figure 2-11: Carver County Annual Forecasted Household Growth (Minnesota State Demographic Center)



2.4.2 Household Growth by City/Township

Additionally, the Twin Cities Metropolitan Council data was used to identify the number of households in each township and city within the County. Projections from the Metropolitan Council 2040 Forecast were used to determine the average annual household growth by township or city over the ten-year periods from 2020-2030 and 2030-2040. The Metropolitan Council anticipates a steeper household growth rate in the first decade and a slower growth in the second decade. Table 2-2 displays the household data per township or city from the Metropolitan Council 2040 Forecast. Most of the growth projected between 2020 and 2040 appears to be in the cities of Carver, Chanhassen, Chaska, Norwood Young America, Victoria, and Waconia. No growth is expected in the townships of Dalgren, Laketown, Benton, and Camden. The identification of these significant areas of growth will be important to the facility location analysis which is discussed further in Section 3.0.

Table 2-2: Metropolitan Council 2040 Forecast - Household Change

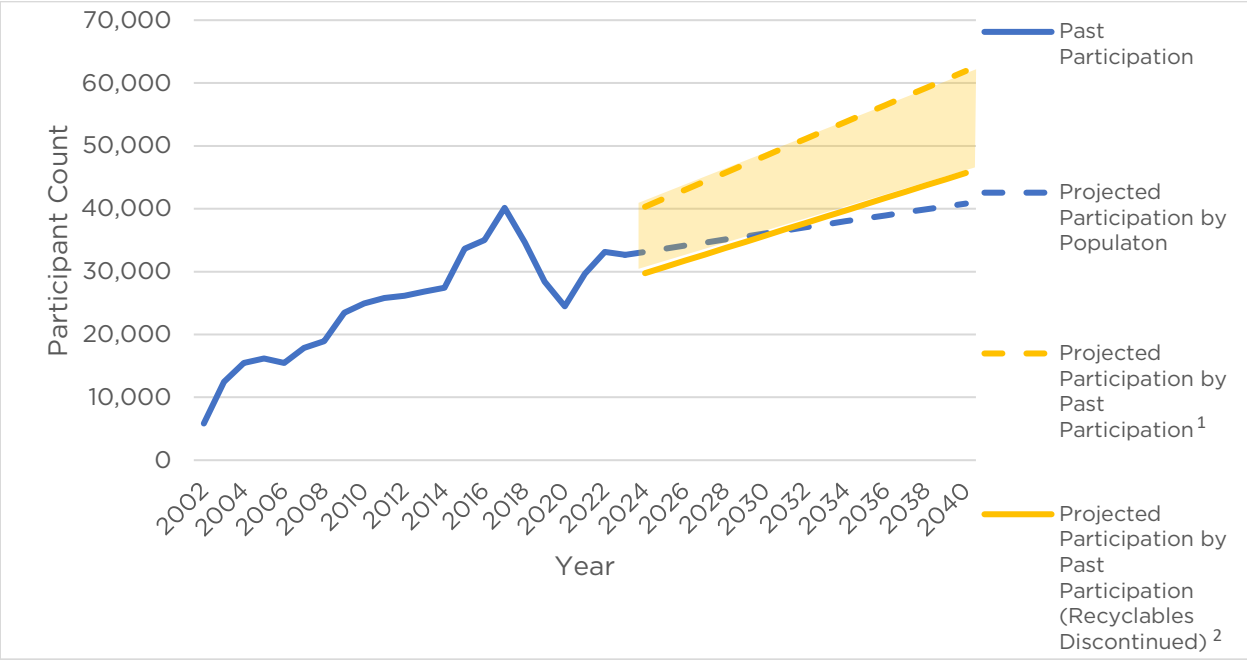
CARVER COUNTY	2020 Total Households	2040 Total Households	2020-2040 Percent of Total Growth	2020-2040 Count Change
Benton Township	300	300	0%	0
Camden Township	340	340	0%	0
Carver	2,120	5,600	16%	3,480
Chanhassen	10,000	14,000	18%	4,000
Chaska	10,400	14,200	18%	3,800
Cologne	800	1,600	4%	800
Dahlgren Township	460	300	-1%	-160
Hamburg	210	250	0%	40
Hancock Township	140	170	0%	30
Hollywood Township	410	500	0%	90
Laketown Township	530	60	-2%	-470
Mayer	750	1,200	2%	450
New Germany	190	330	1%	140
Norwood Young America	1,900	3,900	9%	2,000
San Francisco Township	340	400	0%	60
Victoria	3,500	5,700	10%	2,200
Waconia	5,400	9,500	19%	4,100
Waconia Township	490	600	1%	110
Watertown	1,900	2,900	5%	1,000
Watertown Township	490	500	0%	10
Young America Township	270	300	0%	30
Carver County Total	40,940	62,650	100%	21,710

2.4.3 Projected Participation

To project future HHW program needs, it was assumed that the number of participants at the Environmental Center would increase at rates equal to the annual household growth rates provided in Figure 2-11. Based on this methodology, the County HHW program is projected to grow to over 40,000 annual participants by 2040. Figure 2-12 shows the projected participant count at the Environmental Center from 2002 until present year (blue solid line) and present year until 2040 (blue dashed line). The potential projected number of participants was also calculated using past participation growth rates rather than population, as popularity of the program has increased more steeply than population (yellow dashed line). Additionally, should the County discontinue the collection of commingled recyclables, the potential reduction in participation was calculated (yellow solid line). The range of projected growth is depicted in yellow in the table below. While discontinuing the collection

of recyclables would decrease participation in the short-term, the overall program participation would continue to increase beyond current counts by as soon as 2028.

Figure 2-12: Projected Participant Count at the Environmental Center



1. Years 2019 through 2021 removed from projection calculation due to the discontinuation of yard waste collection beginning in 2019 and potential impacts of the coronavirus pandemic.
2. Assumes a 26.2% reduction in participation (equivalent to the percent makeup of recyclables in 2022 transactions)

2.5 Key Findings

The Environmental Center participation continues to increase annually at a rate that exceeds population growth. The County can anticipate this trend to continue and experience participation increases as much as double from the baseline 2022 amounts by 2040 per Figure 2.12 (yellow dashed line). Participation at Mobile Events has remained relatively consistent from 2021 to 2023 at each location based on the available data. The Satellite Collection Facilities accept a limited diversity of materials. The material quantities collected at the Satellite Collection Facilities over the past three years has remained relatively consistent, indicating that there is not a growing demand for service in those areas. Additionally, 85 percent of the growth projected between 2020 and 2040 is in the central and eastern portion of the County.

3.0 Facility Location Analysis

The location of the Environmental Center, satellite collection facilities, and mobile collection events were analyzed on the effectiveness and ability to serve the County as a whole. Effectiveness is considered in terms of annual participation rate, facility proximity to population densities, and population distance from facilities. Three neighboring County's HHW programs were also evaluated for comparison purposes. The aspects were assessed with the development of heat maps as well as current and projected population densities.

3.1 Methodology

This analysis was conducted using Geographic Information System (GIS) tools and U.S. Census population data. Population density is presented by block group data. The population was calculated within 1-mile, 5-mile, and 10-mile buffer rings of the permanent collection facility. An analysis was then performed relating to each facility's proficiency at serving its given population.

3.2 Carver County Service Locations

The County Environmental Center is in the eastern portion of the County which is densely populated. The satellite collection facilities and mobile events are located in the western portion of the County where the population is less densely populated. These satellite facilities and mobile events provide service availability to those that may not be directly served within a 10-mile radius of the Environmental Center. A map of the County's service locations and population density is presented in Figure 3-1.

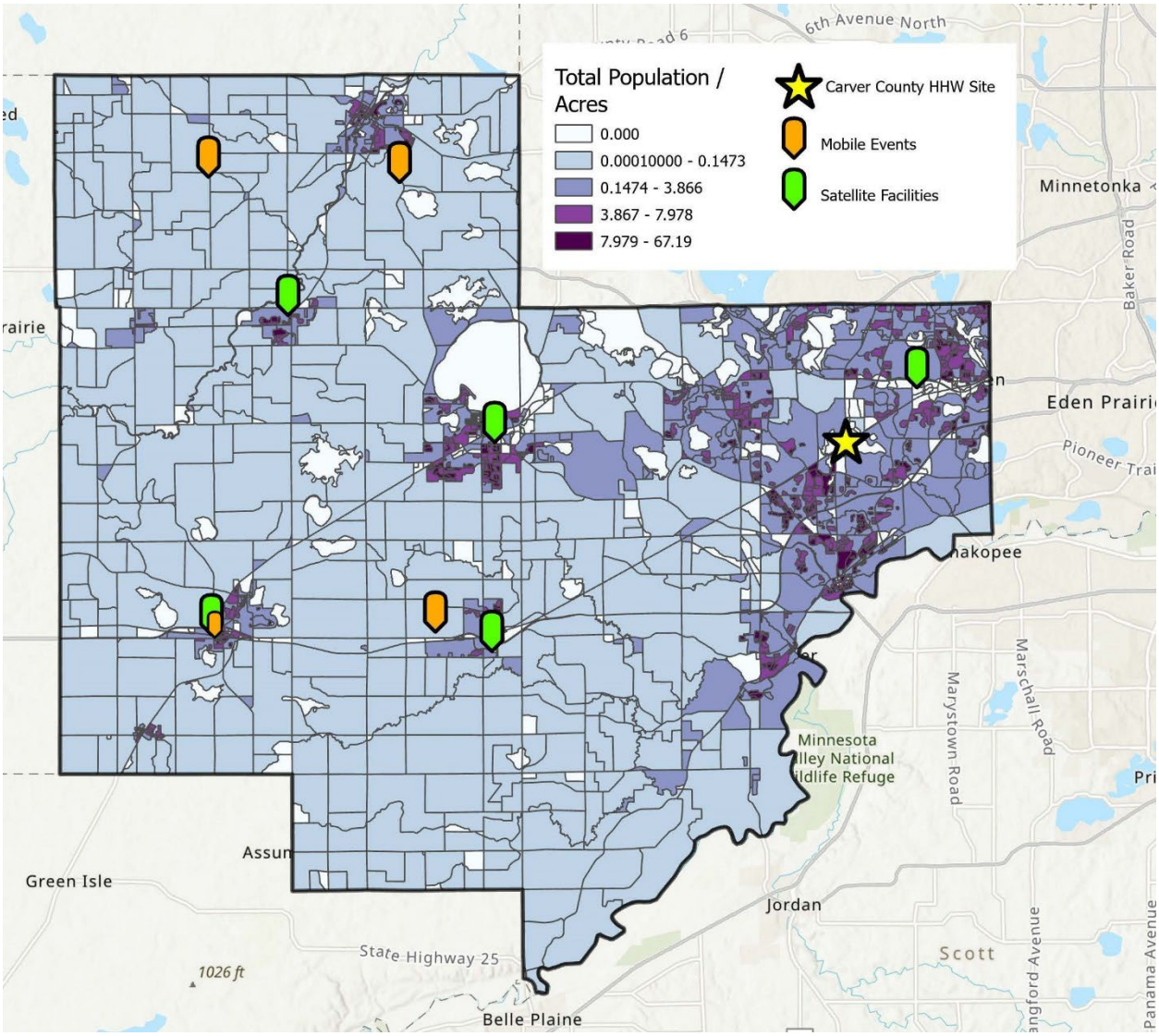


Figure 3-1: Carver County Service Locations Map

3.3 Environmental Center Proximity to Population

The population of County residents living within a 5-mile radius of the Environmental Center is 63 percent and increases to 77 percent within a 10-mile radius. The Environmental Center is serving a high portion of the population within 5- and 10-miles in the current location, as it is in a densely populated area. The population center of the County is located to the west of the Environmental Center by about four miles and the geographical center is located even further west, just south of Waconia. A map of the Environmental Center location, population center and geographical center population is presented in Figure 3-2 with buffer rings of 1-, 5-, and 10-miles around the Environmental Center.

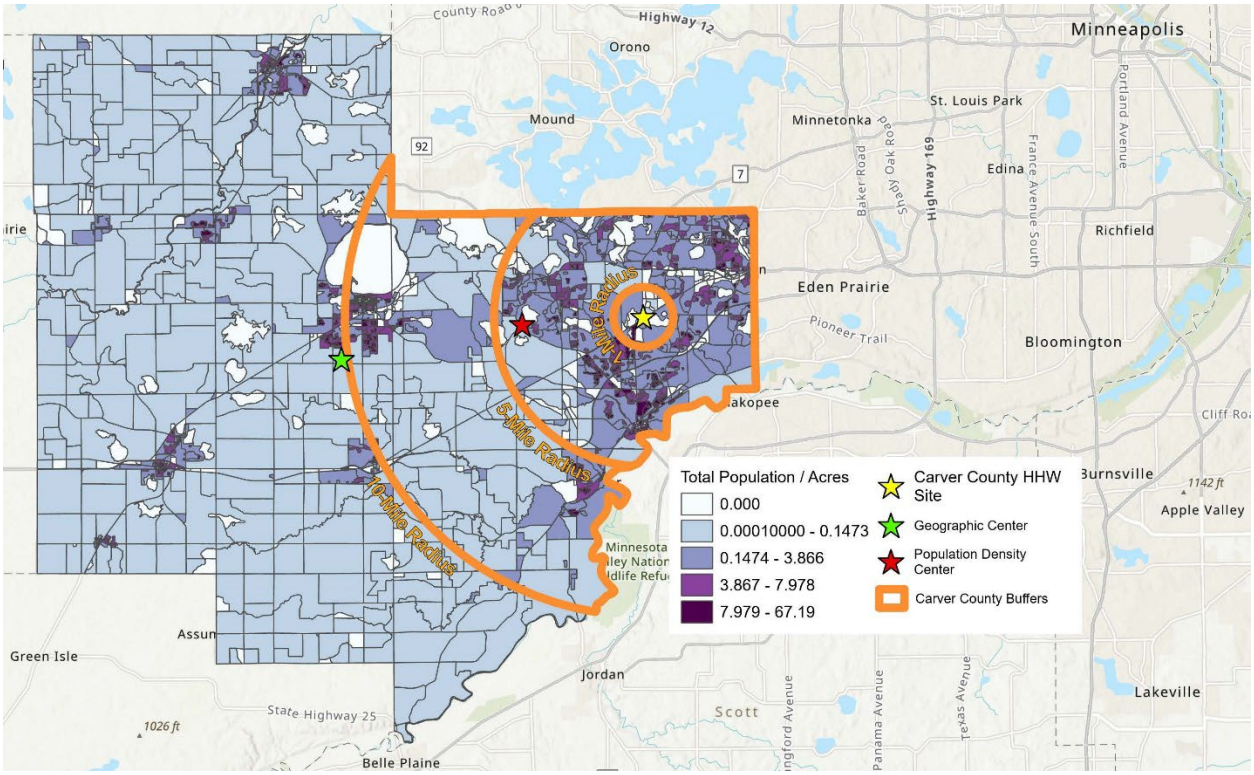


Figure 3-2: Carver County Population Map and Environmental Center, Geographic Center, and Population Center

3.4 Population and Geographical Center Comparison

The population center of the County has 38 percent of the population within a 5-mile radius and 85 percent within a 10-mile radius. While the population center would serve more of the population within a 10-mile radius, it is comparable to the current Environmental Center location. The geographic center was also calculated and only encompasses 17 percent of the population within a 5-mile radius and 63 percent of the population within a 10-mile radius. The Environmental Center location is in an area to serve an effective percentage of the area's population for now and into the future. The population projections presented in Table 2-2 indicate that the population growth will continue to occur in the eastern portion of the County, maintaining a similar density distribution. A comparison of the population densities for the Environmental Center, population density center, and geographic center is presented in Table 3-1.

Table 3-1: Carver County Population Densities by Location

Location Point	Population Within One Mile (%)	Population Within Five Miles (%)	Population Within Ten Miles (%)
Environmental Center	1.2%	61%	77%
Population Center	2.4%	38%	85%
Geographic Center	2.8%	17%	63%

3.5 Key Findings

The Environmental Center serves a high portion of the population within 5- and 10-miles in the current location, as it is in a densely populated area. Relocating the Environmental Center to the west toward the population center does not greatly increase accessibility for most of the population, especially within 5-miles. Based on the population growth projected for each City/Township in the County, the growth is projected in the eastern portion where the Environmental Center is already located (Carver, Chanhassen, Chaska, Norwood Young America, Victoria, and Waconia). The Satellite Collection Facilities as well as the Mobile Events are located close to outer-ring communities and serve those populations. While the proximity for those communities is closer to the Satellite Collection Facilities than the Environmental Center, there is a limited diversity of materials accepted and the Mobile Events are limited to three events throughout the year.

4.0 Benchmark Communities

The County identified three benchmark communities including Anoka County, Scott County, and Washington County, each with a single environmental center facility serving their respective county. Note that Washington County is currently building a second environmental center, but this location was not taken into consideration for this Plan. Each of these benchmark community programs were evaluated for comparison of location effectiveness, accepted materials, and hours of operation. Members of the project team also toured Dakota and Washington County facilities to view alternative facility designs, site layouts, material management practices, and operational methods.

4.1 Location Effectiveness

The population potentially served surrounding each benchmark community was calculated with a 5-, and 10-mile radius, just as was performed for the County Environmental Center. Benchmark communities presented similar findings in terms of serving their populations. For each benchmark community, approximately 65 to 85 percent of the population is served within a 10-mile radius. However, each benchmark community only served between 18 to 36 percent of its population within a 5-mile radius compared to Carver County serving over 60 percent of its population within its own 5-mile radius. Table 2-3 provides these results in greater detail. Maps depicting the location of each community's facility, and population percentage within each radius is included in Appendix A.

Table 4-1: Benchmark Communities Facility Location Analysis

Facility Name	Number of Facilities	2021 Population Size[1]	Population Within Five Miles of Facility (%)	Population Within Ten Miles of Facility (%)
Carver County, Minnesota	1	106,922	61%	77%
Scott County, Minnesota	1	150,928	19%	85%
Washington County, Minnesota	1[2]	267,568	36%	66%
Anoka County, Minnesota	1	363,887	35%	76%

1 - Based on 2021 U.S. Census Data
2 - Second location construction underway

4.2 Accepted Materials

Research of benchmark communities was conducted, in part, to understand the types of materials accepted by each community facility. Carver County collects the widest variety of materials including HHW, commingled recyclables, E-waste, appliances, scrap metal, mattresses, food waste, tires and additional materials. Scott and Washington County both

accept similar items to Carver County, but each have fewer material categories. Anoka County only accepts HHW. Results of this analysis are shown in Table 4-1.

Table 4-2: Facility Acceptance by County

Facility Acceptance by County[1]				
Material	Carver	Anoka	Scott	Washington
Recyclables	X		X	X
HHW	X	X	X	X
E-waste	X		X	X
Appliances	X		X	
Scrap Metal	X		X	X
Mattresses	X			
Food waste	X			X
Tires	X		X	
Other	X[2]			

Notes:
1 – Data obtained from County websites and confirmed during site tours
2 – Additional items such as plastic films and car seats

4.3 Hours of Operation

Each facility offers a variety of hours throughout the week in which they are open for public drop off. All facilities offer hours on Saturdays. The total number of hours open to the public ranges from 14 to 31 hours with the County offering 23 hours. Table 4-2 provides an overview of each program's hours and the days in which they are serving the public.

Table 4-3: Facility Hours of Operation

County	Daily Hours of Operation[1]							Total Hours
	M	Tu	W	Th	F	S	S	
Carver			12 - 7 PM	12 - 6 PM	10 - 4 PM	8 - 12 PM		23
Scott			12 - 6 PM	12 - 4 PM		8 - 12 PM		14
Washington		11 - 7 PM		8 - 4:30 PM	8 - 4:30 PM	8 - 2 PM		31
Anoka[2]			1 - 7 PM	9 - 3 PM	9 - 3 PM	9 - 3 PM		24

Notes:
1 - Data obtained from County websites
2 - Hours of Operation change with Season (Nov - Mar)

4.4 Facility Tours

Members of the project team toured Dakota and Washington County's facilities on August 3, 2023. The tours were informative and provided the project team with ideas of alternative facility designs, site layouts, material management practices, and operational methods. Key takeaways from the facility tours included the following:

- Washington County's self-serve drop off design for co-mingled recycling and scrap metal was a sawtooth configuration where customers deposit material into a roll off box below grade, reducing the overhead lifting and separation of customer and truck traffic.
- Washington County's material processing and storage facility was spacious and included six loading docks with staged trailers to store material. This limited materials from being handled multiple times.
- Dakota County Service kiosk provides a single point of entry and financial transactions for customers. Customers then are directed to proceed to three lanes based on their materials for drop off. The kiosk allowed for efficiency of staff unloading and processing materials and the multiple lanes expedited self-service customers through the facility.

4.5 Key Findings

The County Environmental Center is meeting or exceeding the benchmark communities in service accessibility based on proximity to population, diversity of material types accepted, and service hours offerings. Key findings from the tours have been considered for the future facility options analysis in Section 6.0.

5.0 Recycling Program Evaluation

The Environmental Center currently accepts commingled recyclables (no direct fees charged to customers) as a service offering, which comprises a substantial amount of material, staff time, storage space, and management. Commingled recyclables such as plastic containers, aluminum and steel cans, cardboard, and other paper products are not hazardous nor problem materials by definition and the community has various other outlets for management of these materials. Alternative recycling opportunities are available to the community and include access to curbside recycling and numerous drop off locations throughout the County. An evaluation of alternative options was conducted to determine whether the County should continue to provide the collection service of these materials at their Environmental Center.

5.1 County Recycling Drop-Off Sites

The County currently partners with cities to operate satellite collection facilities which include the collection of commingled recyclables. Partner cities include Cologne, Mayer, Norwood Young America, and Chanhassen (cardboard only). The partner cities provide the location and staffing resources, and the County provides a stipend for staffing and pays for the disposal costs. Table 5-1 lists these drop-off facilities, population in community where located, and what materials are accepted by each.

Table 5-1: City Recycling Facilities Accepted Materials

City	2021 Population[2]	Accepted items[1]
Cologne	2,161	commingled recycling, used oil and oil filters, scrap metal
Mayer	2,405	commingled recycling, used oil and oil filters, scrap metal
Norwood Young America	3,838	commingled recycling, used oil and oil filters, scrap metal
Chanhassen	25,646	cardboard only

Notes:
1 – Based on County websites
2 – Based on 2021 U.S. Census Data

5.2 County Curbside Recycling

Curbside recycling service is required to be offered by the haulers within the incorporated cities of the County via the Carver County Code of Ordinances, Title V, Chapter 50, §50.021 and §50.022. These ordinances require haulers to provide the option for customers to subscribe to recycling service. Haulers must offer the collection of recyclables from each customer at least twice per month and must submit an annual report identifying the weight in tons of all recyclables and all other disposable solid wastes collected from County customers. Haulers that service townships and the unincorporated are not required to offer recycling services, although some haulers may still offer this service.

Curbside services are either provided through a city organized collection contract, or on the open market, where individual residents can contract for service with an individual hauler. A review of eleven cities and townships in the County was conducted to evaluate community access to curbside recycling services. The cities of Hamburg, Mayer, New Germany, and Watertown have organized collection contract which includes recycling collection weekly or every other week. The City of Chanhassen require licensed haulers to provide recyclable materials collection as a base service. All other cities allow for the provision of recycling to be up to each of the individual residential households to subscribe for service. Table 5-2 provides an overview of recycling services by cities within the County.

Table 5-2: Curbside Recycling Options by City

City	2020 Households[1]	Recycling Provided[2]
New Germany	190	Organized Collecton (every other week)
Hamburg	210	Organized Collection
Cologne	800	Open - Subscription
Mayer	750	Organized Collection (every other week)
Norwood Young America	1,900	Open - Subscription
Watertown	1,900	Organized Collection (weekly)
Carver	2,120	Open -Subscription
Victoria	3,500	Open - Subscription
Waconia	5,400	Open - Subscription
Chanhassen[3]	10,000	License Requirement - (every other week)
Chaska	10,400	Open - Subscription
Townships	3,770	Unknown, no ordinance requirements

Notes:
1 – Based on 2020 Metropolitan Council Data
2 – Data obtained from County websites and County Solid Waste Management Plan
3 - Hauler's license required, recycling must be provided weekly or biweekly

The County conducted a Residential Recycling Measurement Study in October 2016 to evaluate the participation in recycling programs.[4] The Study found that participation in County's residential recycling program was very strong with a set-out rate of 80 percent by household at that time. The County should consider updating this measurement study in the near future.

5.3 County Multifamily Recycling

The state of Minnesota passed a multifamily recycling ordinance that requires multifamily properties to provide access to recycling for residents.[5] There is a 95 percent compliance with the ordinance per the Carver County Solid Waste Management Plan 2018 - 2038. This indicates that a significant percentage of multifamily dwellers have access to recycling.

[4] Carver County Solid Waste Management Plan 2018 - 2038.
[5] https://www.revisor.mn.gov/statutes/cite/115A.151

5.4 Analysis

The standard purpose of an HHW collection program is to provide residents with access to safe and proper disposal options for household materials that are not suitable for disposal in a landfill or for collection with other curbside residential programs. The County has ensured access to collection of commingled recyclable materials in addition to HHW and problem materials. There are alternative options available to residents for commingled recyclables, including curbside services and other drop off locations.

The current Environmental Center provides a popular recycling program which offers advantages such as diversion of materials from the landfill, providing a resource to residents without access to recycling, and incentivizing users to bring other hazardous waste in tandem with commingled recyclables. However, the current recycling program also comes with disadvantages such as traffic congestion and spatial constraints. If the Environmental Center were to discontinue their acceptance of recycling this could potentially relieve some immediate spatial constraints and traffic congestion at the facility. Discontinuing recycling could also provide staff with additional time to dedicate to more hazardous or problem materials management. Disadvantages to discontinuing the recycling program could include a decrease in customer satisfaction as well as limiting the availability of access to recycling. A summary s of the advantages and disadvantages of the current recycling program is shown in Table 5-3 below.

Table 5-3: Environmental Center Recycling Collection Analysis

Options	Advantages	Disadvantages
Continue to Accept Recycling	• Popular program with the community • Diversion of materials from the landfill • Customers to bring other more hazardous materials along with their commingled recycling • Resource for those without subscriptions to curbside recycling	• Traffic congestion associated with service • Spatial constraints at the facility • Staff time spent on management of recycling that could be spent on other more hazardous/problem materials • Costs for recycling processing
Discontinue Accepting Recycling	• Relieve some immediate spatial constraints at the facility • Free up staff time to spend on more hazardous/problem materials • Traffic congestion relief	• Customer satisfaction may go down • Limit availability of free access to recycling

5.5 Key Findings

Based on our understanding of the County's programs, most of the single family and multifamily residents in the County have convenient access to recycling through curbside or onsite collection. Per available data, participation in these programs appears to be high. There

are also drop-off options for recyclables throughout the County. While the County's service offering of recyclables collection at the Environmental Center is popular, it presents challenges such as traffic congestion, safety, and staff resources. Discontinuing the collection of recyclables at the Environmental Center would relieve some immediate spatial constraints, traffic congestion, and provide staff with additional time to dedicate to more hazardous or problem materials management. The County should consider additional options to those already available such as additional community drop off locations or increased access to curbside services via ordinance if it moves forward with the option to discontinue recyclables at the Environmental Center.

6.0 Facility Operations Analysis

This facilities operations analysis provides an independent evaluation of the current Environmental Center operating practices. The following section provides analysis of current conditions and practices, as well as an evaluation of the operations and facility layout. The Burns McDonnell project team performed a site visit on August 2, 2023, at the County Environmental Center to observe typical operations, examine the facility, and interview staff. The weather was clear and warm.

6.1 Operations Background

The Environmental Center is open to the public four days per week. Environmental Center staff work outside of these operating hours to prepare and ship materials, train, and perform other tasks and duties. The Environmental Center accepts and manages a wide range of materials from residents as described below:

- HHW: materials with hazardous or toxic properties, such as latex paint, oil-based paint, paint remover, stripper, thinner, stain, varnish, aerosol cans, mercury thermometers & thermostats, household cleaners, bug killer, fertilizer, pesticides, weed killer, propane tanks, gasoline, batteries, fluorescent lights, and sharps.
- Problem materials: materials difficult to manage, such as scrap metal, mattresses, appliances, tires, E-waste, food waste, plastic bags, and films.
- Recyclable materials: materials that may be offered for recycling, such as plastic containers, cans, paper, and cardboard.

The Environmental Center operates a Very Small Quantity Generator (VSQG) collection program that allows qualifying businesses to use the services available to residents to manage a variety of materials generated by the business. Environmental Center staff provides technical assistance to the businesses to ensure disposal and transport requirements are met for generated materials. During operating hours, the Environmental Center provides a Product Reuse Room to give back to residents, at no cost, usable materials such as paint, oil, automotive products, household repair, and cleaners.

6.2 Building and Site Infrastructure

The County provided a survey and site map of the Environmental Center. The building is a 1996 concrete block construction with a total building footprint of 10,095 square feet with an office area of 3,237 square feet and an operations area of 6,858 square feet. The customer receiving area is covered with a steel canopy and faces roughly south with customer recycling areas along the east side of the building. Before being purchased by the County the building was reportedly used by a heating ventilation and air conditioning company.

The Environmental Center site encompasses 5.11 acres. The site is bound to the southeast by a railroad, to the northwest by Peavey Road, to the west by Peavey Circle and an adjacent lot and the northeast boundary are adjacent lots. The building and paved surfaces include most of the usable lot area. However, there are areas on the property where the building and/or paved surfaces could be expanded. Consideration for set-back distances and environmental considerations would need to be evaluated to determine the viability of any expansion.

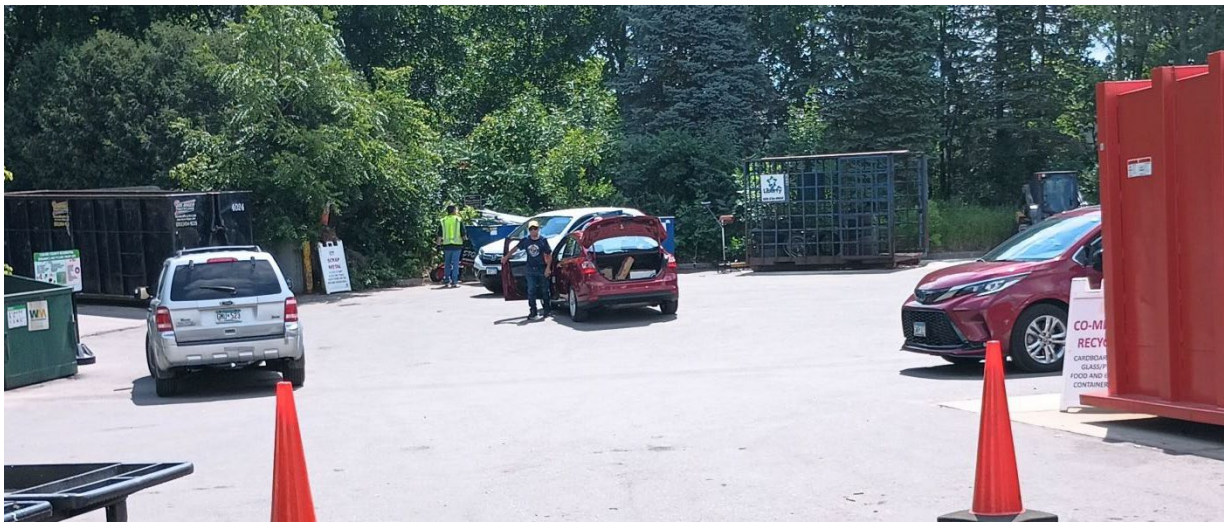
The interior operations area is largely an open area except for a long bulking room approximately 11 feet by 50 feet where used oil, antifreeze, and flammable liquids are bulked into containers and other items, such as small camp stove propane cylinders and fire extinguishers, are packed directly into shipping drums. Existing ventilation and climate control is limited.

6.3 Traffic Flow

Facility staff indicated that the level of customer demand during the site visit was less than expected for a typical Wednesday, which is normally the busiest day of the week. However, customers waiting for service still backed up beyond the facility driveway onto the public road. Interviews with customers prior to being served, counts of cars in line, service times at the receiving area, and overall time on site were recorded.

All customers are directed to pass under the canopy and check in with staff in the receiving area. Customers are then directed to various areas of the facility to unload their materials. HHW is unloaded by staff under the canopy. Customers with problem materials and recyclables are directed from the customer receiving area to the recycling area toward the back of the facility. The recycling area space can become congested and does not have any clear marked vehicle direction pavement markings. Customers maneuver in all different directions and often reverse their vehicles creating an unsafe environment for both vehicles and pedestrians. Vehicle turning space is limited and can present potential conflict paths while accessing the various drop off materials and in turning around to exit the property. Figure 6-1 shows the congested drop off area and the mix of pedestrian and vehicle access in the recycling area.

Figure 6-1: Recycling Drop-off Area Traffic Congestion



On Saturday mornings, staff indicated that traffic queuing backs up to Peavey Road so the full length of Peavey Circle is used in both directions to queue customers as shown on Figure 6-2. During weekdays, this method causes traffic difficulties for customers trying to access the businesses on Peavey Circle.

Customers are directed to use the left lane of the driveway to access the receiving area, crossing typical traffic flow. Driving on the left side of the road can cause confusion and potential collisions at the driveway entrance and exit. However, this allows a smoother clockwise circulation of traffic on site. Limited parking for staff and Product Reuse Room visitors is often blocked by the queue.

Figure 6-2: Consumer Queuing onto Peavey Circle

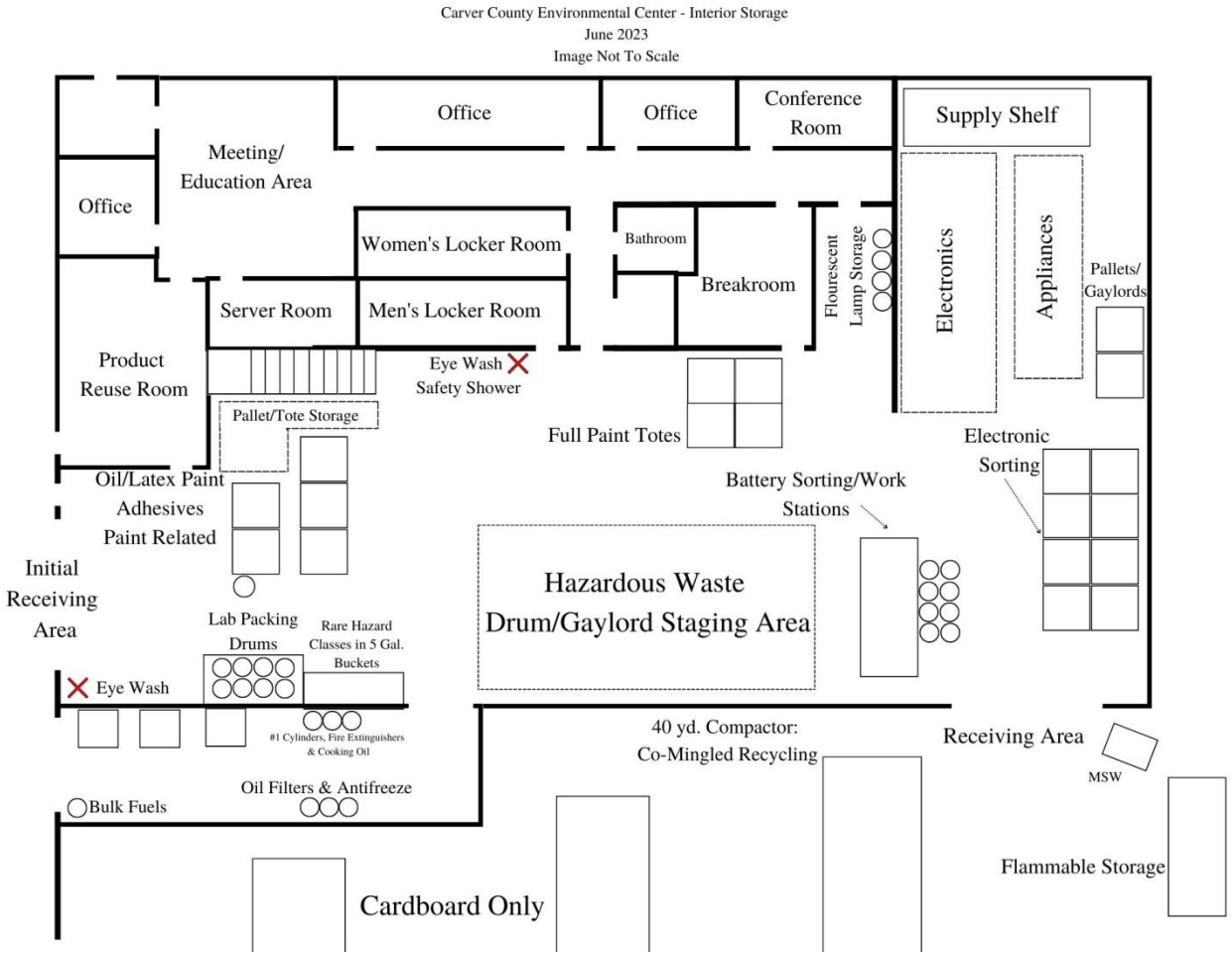
6.4 HHW Receiving

All customers pass through the receiving area where HHW is unloaded even if the customer does not have HHW and is only bringing in problem materials or recyclables. This operating practice provides a control point for all customers and capturing of participant data and collecting payment, however it can be a choke point during high volume timeframes because all customers must pass through this control point, even those with recyclables or items that do not require payment.

6.5 Interior Materials Flow

As shown on the Interior Storage Layout diagram, Figure 6-3, within the building the flow of materials is dedicated to HHW from the initial receiving area through the battery sorting/workstations area. The back of the building, north end, is dedicated to E-waste sorting into cubic yard boxes and the storage of E-waste, appliances, and supplies.

Figure 6-3: Interior Storage Layout



Overall, the movement of HHW, E-waste and appliances is methodical and efficient. Higher volume HHW materials are staged close to the receiving area, vertical storage is used to good advantage, and the use of stackable containers optimize many areas inside the building. Staff uniformly indicate they have excellent communication and autonomy to work as a team to arrange the layout or may recommendations to best suit the operational needs and improve safety or efficiency.

The facility throughput is maximized to accommodate the variety and quantity of waste accepted. Complex coordination of shipments and storage space is required for the facility operations to remain functional, safe, and efficient. The paint totes are located just inside the initial receiving area for quick access and effort to pre-sort carts as customers unload expedites the process and minimizes excessive handling. This location is also proximate to the Product Reuse Room where some of the materials are offered for reuse.

In the lab pack area, commonly used containers have good access, and a ventilation hood is available nearby. The flammable, toxic category is maximized to manage pesticides and lawn and garden materials quickly and safely, as shown in Figure 6-4.

Figure 6-4: Packaging Area for Flammable, Toxic Materials

Figure 6-5 shows shelving is used to manage smaller containers used less frequently.

Figure 6-5: Less Common Materials Stored in Shippable Buckets

As shown in Figure 6-6, reuse, cleaners, aerosols are aggregated on carts and moved through the facility to be placed in packaging as time allows.

Figure 6-6: Similar Materials Aggregated on Carts for Final Packaging

6.6 HHW Management Practices

Generally, the observed HHW management practices appear to be safe and efficient. The facility has been upgraded to include an overhead ventilation hood in the lab packing drums area and an exit door retrofitted into the east wall of the bulking room. Safety features include automatic fire sprinklers throughout the operating areas as well as explosion proof electrical wiring and fixtures in the bulking room.

6.7 Bulking Room

Gasoline, fuels, solvents, and other highly flammable and volatile materials are bulked into a 55-gallon drum in the bulking room. As shown in Figure 6-7, uncontaminated used oil and antifreeze are also bulked into intermediate bulk containers (IBCs) in this long narrow room but are much less volatile. In addition, small camp stove propane cylinders and fire extinguishers are packed directly into shipping drums. In interviewing the operating staff, they mentioned that regulatory inspectors have not required any changes to any of the HHW handling or processing areas to date.

Figure 6-7: Used Oil Pour-off is a Popular Service

During an Environmental Center site visit in 2006 by David Nightingale, the bulking room had signage that included a flammable liquid storage limit of 180 gallons, see Figure 6-8. Other areas of the facility in 2006 had similar flammable storage limits, 180 gallons each. During the site visit on August 2, 2023, the bulking room contained multiple 55-gallon drums more than 180 gallons and the original signage was no-longer present. Staff confirmed that the room was not intended to be designated as a flammable materials storage room and the Fire Marshal directed the sign removed. Staff clarified that all full containers are stored in a designated area outdoors at the end of each working day. Best management practices indicate that full drums should be moved outdoors throughout the day as they are filled.

Figure 6-8: 2006 Bulking Room Flammable Liquids Storage Signage

6.8 Lithium Battery Sorting and Storage

The battery storage workstations at the Environmental Center is where various batteries and battery containing devices are sorted and packaged for shipment for recycling and disposal. Of special concern is the management of lithium metal and lithium-ion batteries due to their recent proliferation in the waste stream and history of battery-initiated fires in collection vehicles and at solid waste facilities.

In May this year, a lithium-ion battery caused a fire in a solid waste collection vehicle near Pine City MN[6]. The driver dumped the load on White Oak Road, just north of Pine City, MN where the fire department put out the fire. In January 2023 a similar incident with a battery fire in a garbage truck occurred in Duluth and the West Lake Superior Sanitary District reported that they have had two lithium battery fires at their transfer station in 2022.[7] Hubbard County Solid Waste Department reported three battery fires at its south transfer station in 2023 as of April.[8] This recent history of accidental fires caused by lithium batteries is reflected across the US.[9]

The Environmental Center facility, like most HHW collection programs, collects, and properly processes lithium batteries for safe shipment offsite. However, there are more robust standards which are likely to be imposed in the foreseeable future in the fire code regarding storage of lithium batteries.

6.9 Operations Evaluation and Recommendations

This analysis considered a high-level feasibility evaluation of options for the County to continue to occupy and operate out of the current Environmental Center. The analysis considered options for a possible building expansion, improvement options for traffic, and operational changes that may impact efficiency and safety. This evaluation did not include an evaluation of the remaining expected life of any structural, mechanical, or other specific building system. The County should consider performing a facilities condition assessment in accordance with the County's standard facility evaluation process to determine the longevity of the facility from a structural, mechanical, or other maintenance-related building system.

6.9.1 Building and Site Infrastructure

The industry recommended planning level sizes for HHW buildings is based on the population in a service area. For service area populations of 100,000 and larger it is recommended that an HHW facility be planned for between 10,500 and 14,000 square feet.[10] This range of planning level building sizes accommodates acceptance, management, and storage of the traditional types of household chemicals as well as modest sized office, supplies storage,

[6] https://www.isanti-chisagocountystar.com/news/lithium-ion-battery-disposal-causes-fire-in-garbage-truck/article_cad39744-f5b4-11ed-95ab-6ba4bf381918.html
[7] https://www.fox21online.com/2023/01/27/incorrect-disposal-of-rechargeable-batteries-leads-to-garbage-truck-fire/
[8] https://www.parkrapidsenterprise.com/news/local/to-prevent-fires-batteries-have-new-rules-at-hubbard-county-dump
[9] https://wasteadvantagemag.com/managing-small-consumer-batteries-part-1/
[10] https://wasteadvantagemag.com/six-of-the-most-forgotten-features-at-hhw-collection-facilities-part-1/

breakroom, restrooms, mechanical room, and a reuse area. The planning level building size does not include space for E-waste, white goods, scrap metal, tires, cardboard, food waste, or other large volume waste types. Additional space is needed to accommodate these additional waste streams.

The current facility has a 10,095 square feet footprint and is just below the recommended range for managing the traditional HHW waste stream. Additionally, the facility manages E-waste inside the building that results in significant storage space for E-waste material. While there are some possible expansion areas within the site for a larger building and additional traffic lanes, these opportunities are limited in scope. Nonetheless, even these limited opportunities for expansion may provide significant improvements to the overall facility operating efficiency, safety, or both. These opportunities are specific to certain operating choices and may be combined or implemented individually. The details of various options regarding the current or potential future facilities are discussed in Section 8.0.

As stated in a previous Section, the Metro Council estimates that the population of the County will grow to over 161,000 people by 2040. As the service area's population increases well beyond 100,000, a larger facility needs to be considered.

6.9.2 Traffic Flow

It would be helpful to reduce the level of queuing by allowing cars to access the commodity recycling areas without going through the same line where cars with HHW are being unloaded, however, these customers would then not be tracked. This might be accomplished by modifying the current traffic flow within the current paved footprint. Limiting the number of recyclables accepted may also be a viable future option to consider. Because the customer lines are largest in the first few hours of operation, this suggests that spreading out the customer arrival time using an appointment system might be one option to reduce large early-hours queuing.

Truck traffic and loading is challenging due to tight turning radii and a lack of loading docks. Loading docks provide direct forklift access to load or unload a truck and significantly reduce loading and unloading time for every shipment. It may be possible to improve truck access and loading efficiency within the site boundaries. Exploring a new paved loop around the building and adding loading docks parallel to the north side of the building may be a viable option to improve truck access and improve the time-efficiency and safety of loading and unloading trucks.

6.9.3 HHW Receiving Area

Staff indicated that operational procedures in the receiving area were amended during the pandemic to improve social distancing for staff and facility users. Customers unloading their own materials onto carts under the direction of staff has proven to be safe and efficient. This allows staff to scan materials for additional hazards and containment issues during the unloading process, as shown in Figure 6-9.

Figure 6-9: Participants Unload HHW in Receiving Area

6.9.4 Lab Pack Area

There is a ventilation hood in the lab pack area along the wall. When possible, storing containers that are actively being packed closer to the ventilation hood would improve vapor and dust controls. Using shippable buckets and shelving is an effective method to store materials as they fill. It is recommended that this area be expanded and improved to allow for single, unstacked bucket storage with labels out and segregation for incompatible materials.

6.9.5 Interior Materials Flow

As mentioned, the overall materials flow and management of wastes inside the building is generally space efficient and well used. Stacking of waste latex paint, E-waste and other materials helps to optimize the use of the limited interior operating space. See Figure 6-10.

Figure 6-10: Vertical Stacking of Latex Paints

The facility throughput is stretched to accommodate the amount and types of waste accepted. If there were space to place empty semi-trailers on site or at a set of new loading docks, appliances and electronic wastes may be stored in the semi-trailers instead of inside the building. This would free up a large part of the back storage area of the building for other more difficult to manage wastes and materials as well as space for additional supply storage.

6.9.6 Bulking Room

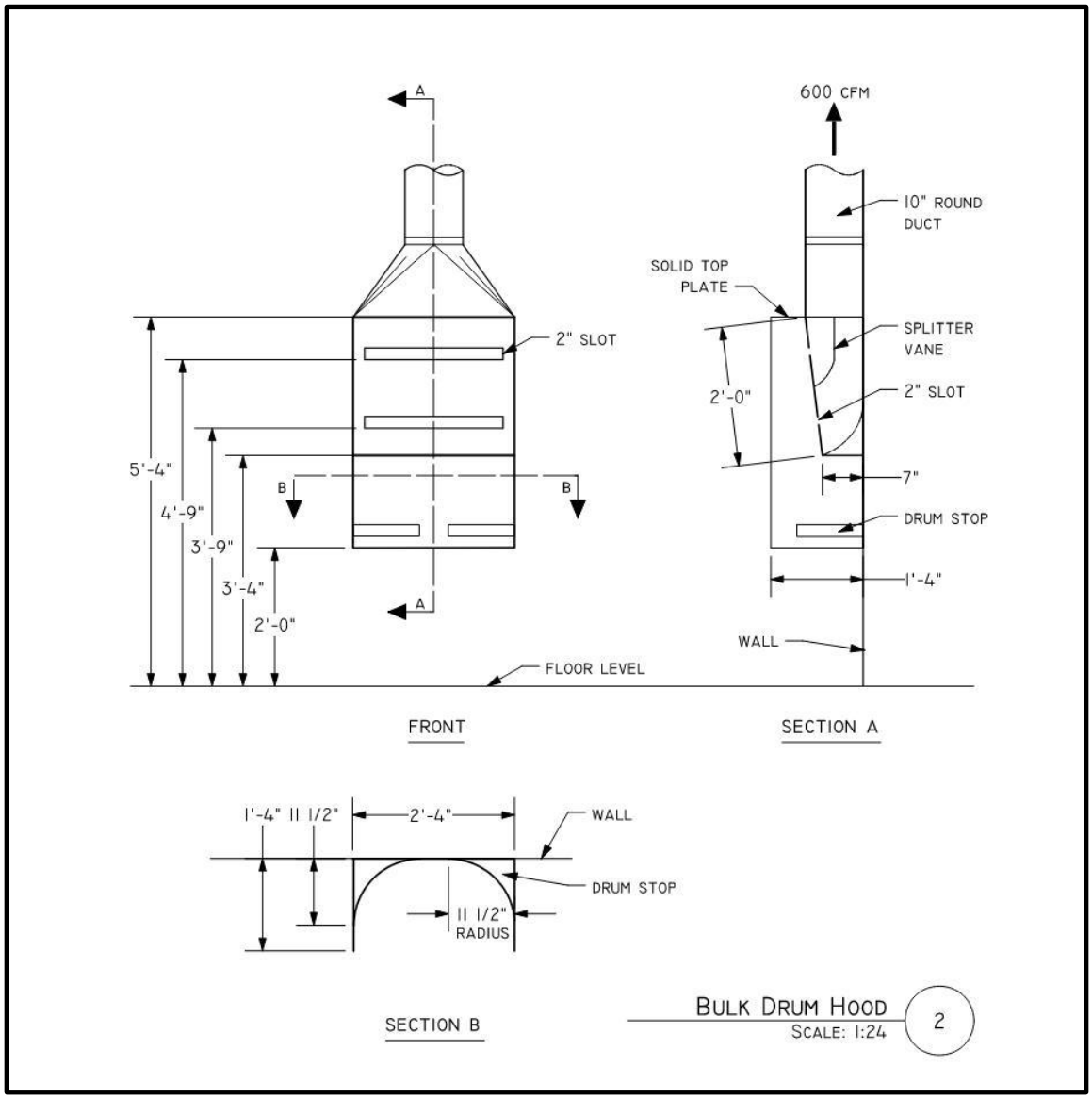
The current practice for small open containers in the Environmental Center bulking room is to bulk these class IB and IC flammable liquids into one 55-gallon drum, which is below H occupancy threshold of 60 gallons for open flammable liquids. In addition, current practice is to store up to four full drums of flammable liquids before moving a 4-drum pallet full to the outdoor metal dedicated flammable liquids cabinet. Four 55-gallon drums in storage would be no more than 220 gallons, again just under the 240-gallon threshold limit which would otherwise lead to an H occupancy designation in the bulking room. Consequently, current practice indicates that the bulking room would not be classified as an H occupancy.[11]

[11] Table 307.1(1) in the 2020 MN Building Code.

There are requirements in the 2020 Minnesota Building Code where hazardous materials are managed in occupancies other than those designated as H. These general requirements include those from Section 414, Hazardous Materials, where those materials are processed and stored. Regarding the bulking room, subsection 414.3 of the Minnesota Building Code requires that, “Rooms, areas or spaces in which explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are or have the potential to be emitted due to the processing, use, handling or storage of materials shall be mechanically ventilated.” Currently there is no mechanical ventilation in the bulking room where there are certainly flammable vapors or fumes emitted when gasoline and similar liquids are being bulked. This current 2020 Minnesota Building Code requirement may not have been in place when the Environmental Center was permitted. Most provisions of codes are not applied retroactively. However, the current code could be considered best practice and therefore used as a standard to upgrade the current bulking room with effective mechanical ventilation.

Effective ventilation hoods at flammable liquids bulking stations are becoming standard practice at new HHW facilities and retrofitting at existing facilities where flammable liquids are bulked. A sketch of a widely adopted HHW ventilation hood for this purpose is shown in Figure 6-11. It is recommended that the Environmental Center bulking room install a ventilation hood at the flammable liquid bulking workstation to remove vapors from the breathing zone of the workers and prevent accumulation of high concentrations of flammable vapors in the bulking room. Further analysis of the existing ventilation system and electrical load is necessary to develop a cost estimate for procurement and installation of a fume hood.

Figure 6-11: Flammable Liquids Bulking Ventilation Hood Diagram



Many residents bring used oil, often in a reusable container or pan, to the Environmental Center and will wait a short time to take the container back with them. To improve access and containment, it is recommended to implement a double-walled collection tank manufactured for this purpose to collect used oil. Recommended tank specifications would include double-wall construction for secondary containment, venting, volume gauge, and work area height that is more ergonomic for most users. This would replace the current totes located on secondary containment pallets. The estimated cost of a 500-gallon double walled tank is less than $10,000.

6.9.7 Lithium Battery Sorting and Storage

Due to the dramatic increase in lithium battery fires, a new section of the fire code was proposed for the national 2021 edition. Although that proposed new section was not adopted

nationally, nor in Minnesota, two states, California and Washington have adopted the new section regarding the safe storage of lithium metal and lithium ion (Li) batteries. This proposed part of the fire code is a new Section 322. This section may be seen as a current best practice for Li battery storage at HHW collection facilities.

It is likely that the new section 322 or a similar requirement will be adopted nationally and in Minnesota in the foreseeable future. Consequently, a brief review of this prospective code may provide concepts and methods that may be prudent to implement ahead of its adoption. Section 322 of the Washington state amendments to the 2021 International Fire Code is provided in Appendix B.

The proposed section 322 of the fire code focuses on the safe storage inside and outside of buildings for Li batteries.

There are essentially three options for storage of Li batteries under subsection 322.4. Any combination of the following storage options is acceptable.

- 322.4.1 - Limited Indoor Storage in containers
- 322.4.2 - Indoor Storage Areas
- 322.4.3 - Outdoor Storage

Under 322.4.1, Limited Indoor Storage in containers, no more than 15 cubic feet, equivalent to two 55-gal drums of Li batteries may be stored inside. In addition, there is a requirement that the container be open-top and constructed of noncombustible materials or shall be approved for battery collection. Li batteries in plastic and cardboard containers, which would not meet this proposed requirement.

At the Environmental Center there were containers for damaged, defective, and recalled (DDR) Li batteries, non-DDR Li batteries, as well as containers for devices with embedded batteries, many likely include Li batteries. The cumulative amount of Li batteries in storage at the Environmental Center may be approaching or exceeding the 15 cubic feet threshold identified in section 322 for Limited Indoor Storage in containers.

There is an ever-increasing use of Li-Ion batteries in consumer products. This will only increase the need for Li battery collection and storage in the foreseeable future. Consequently, going forward it may not be easy for the County to manage the expected volume of Li batteries solely using Limited Indoor Storage in containers requirements.

For Indoor Storage Areas, a paraphrase of subsection 322.4.2 includes:

1. The fire official may require the development of a technical opinion and report. Not sure who would do this or how long it may take.
2. Construction would require another room with 2-hr fire ratings or the use of a prefabricated building inside the existing building.
3. The indoor storage area would need to have smoke or radiant energy fire detection and alarm system, these are commercially available, off-the-shelf components.
4. If the technical opinion and report were required (1), explosion control might be required. If there is no technical report, the local fire dept. might require this anyway.
5. The indoor storage area would require an automatic fire sprinkler system, this is already a requirement throughout the building.

6. If each battery was tested for a reduced state of charge, <30%, the technical report (1), 2-hour fire barrier (2) and explosion control (4) requirements are removed. It is technically challenging to accurately measure the state of charge of Li batteries. Additionally, determining the state of charge of each battery would be unduly time consuming and likely a major added operating expense.

For Outdoor Storage, as paraphrase of subsection 322.4.3 includes the following:

1. The size of the storage must be less than 900 square feet.
2. In unrated fire barrier construction, the storage would have to be at least 20 feet from buildings, public streets, property lines, alleys, or means of egress. This would put the storage area inconveniently far from the main operating area.
3. In a 2-hour fire rated prefabricated structure the setbacks would be reduced to not less than 3 feet. This would be preferable from an operating efficiency standpoint.
4. The storage area would need to have smoke or radiant energy fire detection and alarm system, again, these are commercially available, off-the-shelf components.
5. The storage area would require an automatic fire sprinkler system, as the rest of the building is already.

It is recommended the County take advantage of the Limited Indoor Storage in containers allowances under subsection 322.4.1 and move full containers into an Outdoor Storage in a prefabricated 2-hr fire rated structure to stay below 15 cubic feet of Li storage in the main HHW processing area. This will allow the dedicated outdoor storage prefab building to be operationally close to the main HHW processing area.

6.10 Key Findings

The County Environmental Center has a well-operated overall safe, efficient, and effective service to its customers. The following areas are highlighted for consideration.

- There are challenges with spatial constraints both outside with traffic and inside with material storage. Improvements to the facility are presented in Section 8.0. Alternative traffic flow and customer receiving locations based on whether customers are bringing in HHW could reduce some of the customer lines and time on site.
- The ventilation hood in the sorting area is being under-utilized and prioritizing storage of containers actively being packed under the ventilation hood will improve safety for employees.
- Standardize the practice of moving full flammable liquid drums to the outdoor storage area and not store in the flammable bulking room in excess of 240 gallons (4 55-gallon drums) per the building codes and fire department requirements.
- The storage limits should be investigated to ensure operations are compliant with current permitted building or fire permits.
- Installation of a ventilation hood at the flammable liquid bulking workstation is recommended to remove vapors from the breathing zone of the workers and prevent accumulation of high concentrations of flammable vapors in the bulking room.
- There is an ever-increasing use of Li-Ion batteries in consumer products as well as a dramatic increase in lithium battery fires. Best management practices for the storage of Li batteries are presented in Section 322 of the California and Washington adopted

fire codes. This Section recommends limited indoor storage of Li batteries and moving full containers into an outdoor storage in a prefabricated 2-hr fire rated structure.

7.0 Future Options Analysis

The County is at a crossroads with an aging facility that is operating at its maximum capacity resulting in the need to consider options for the future of the Program. There are several potential program issues for consideration including utilizing the current facility or developing a new facility, alternative locations for a new facility, level of service offered in the less populated areas, and evaluating whether to continue to accept commingled recyclables as part of the program. Several option combinations were considered in the development of this Plan and discussed with County staff. The following six options were identified for further consideration.

1. Stay in current facility and maintain current service offerings.
2. Prioritize hazardous materials collection and make operational and site improvements.
3. Develop a new facility to replace the existing facility.
4. Stay in the current facility, implement Option 2, and add a second facility.
5. Stay in the current facility, implement Option 2, and host additional events.
6. Stay in the current facility, implement Option 2, and expand service offerings at satellite locations.

Considering these six options, five rely on the continued use of the current facility and only one involves abandoning the current site. Additionally, implementing different options involve the potential to change the types of materials accepted, specifically, discontinuing the collection of commingled recyclables. Each of these options was evaluated at a high level to determine the feasibility and appropriateness for implementation. The evaluation criteria includes a planning level description of the following (as applicable):

- Location
- Capacity
- Service (collection of commingled recyclables)
- Traffic and Safety
- Efficiency
- Cost

A snapshot of the evaluation criteria for each option is provided in Table 8-1. Whether the County maintains the current Environmental Center location or relocates to a new facility further west, the location will effectively serve the community as described in Section 3.0, Location Analysis.

The current Environmental Center is at or exceeding capacity. In order to remain in the facility for the next decade or longer, it will require implementing improvements which are described in Option 2, as well as applied to Options 4 through 6.

Only Option 1 and Option 3 include the continuation of the collection of commingled recyclables, as these materials demand significant amounts of storage space and staff resources. Maintaining collection of recyclables at the current Environmental Center will challenge the County's ability to meet capacity demands, solve the traffic issues, or gain

operational efficiency. All of the options include recommendations to improve safety through operational improvements.

Table 7-1: Evaluation of Options by Criteria

Option	Location Effectiveness	Meets Capacity Demands	Collection of Recyclables	Improves Traffic	Improves Safety	Improves Operational Efficiency	Cost (High, Med, Low)
1	•		•		•		Med
2	•	•		•	•	•	Med
3	•	•	•	•	•	•	High
4	•	•		•	•	•	High
5	•	•		•	•	•	Med
6	•	•		•	•	•	Med

7.1 Option 1 - Current Facility and Maintain Current Service Offerings

Option 1 includes the County continuing operations at the current facility and maintaining all current service offerings. This option meets the evaluation criteria as follows:

- **Location.** Location is sufficient as 77% of the population is within a 10- mile radius.
- **Service availability**. Maintains current service options, specifically, the collection of commingled recyclables.
- **Capacity.** The current facility is at or exceeds capacity and would still be insufficient even if modifications were implemented.
- **Traffic and Safety**. There are several options to improve traffic and safety but would still present challenges especially as demand increases.
- **Efficiency**. Efficiencies could be improved at the current facility as discussed in Section 7.3.
- Capital costs will be moderate.

Because Option 1 includes the continued collection of recyclables it will be very challenging to meet capacity, traffic, safety, and efficiency needs and therefore, it is not recommended that the County move forward with this option.

7.2 Option 2 - Stay in Current Facility, Prioritize Hazardous Material Collection Services, and Make Site Improvements

Option 2 includes the County continuing operations at the current facility, but prioritizing service offerings to include only materials that meet the definition of hazardous and problem materials that have limited collection options elsewhere in the community. Several site improvements are recommended as part of this option to allow the County to continue to serve the community with this facility. Three variations on the recommended site improvements are depicted in figures provided in Appendix C. This option meets the evaluation criteria as follows:

- **Location.** Location is sufficient as 77% of the population is within a 10- mile radius.

- **Service availability**. Would require discontinuation of commingled recyclables.
- **Capacity**. Capacity could be sufficient if modifications are realized.
- **Traffic and Safety**. Traffic and safety would be improved but still presents challenges, especially as demand increases.
- **Efficiency**. Efficiencies could be improved at the current facility as discussed in the following sections.
- **Cost**. Capital costs will be moderate.

The following sections discuss recommendations for facility and operational modifications and site improvements.

7.2.1 Discontinue Acceptance of Recycling

It is recommended that the Environmental Center discontinue collection of recyclable materials which do not meet the definition of hazardous materials. Eliminating recyclable collection at the facility would reduce the total daily participants significantly and ease current traffic challenges. It would also free-up space through the removal of three compactors/roll-offs in the rear storage area of the building. The reclaimed space could be utilized for placement of a semi-trailer for the storage of E-waste. The County would also experience cost savings associated with processing costs for that material stream.

Notable disadvantages include decreased customer satisfaction and reduced access to recycling in the area. To address this concern, the County should explore partnerships with municipalities and townships, as well as the private sector, to host additional cardboard collection drop sites. At minimum, provide additional cardboard drop off locations in the eastern portion of the County through host arrangements (e.g., Chanhassen). The County may also evaluate amending the County Code of Ordinances, Title V, Chapter 50, to require haulers to offer curbside recycling throughout the entire County (not exclusive to municipalities).

7.2.2 Point of Service Kiosk

A point of service kiosk with a traffic arm to control throughput is recommended to be located near the facility canopy, as shown in Appendix C. A kiosk would help streamline customer interaction while also allowing for capture of tracking participants and material types. The location of the kiosk near the canopy will allow for staff to multitask between servicing customers from the kiosk and with operational tasks during low traffic times. This location will also allow for similar queuing capacity to the current length.

7.2.3 Dedicated Lanes for Material Types

In addition to a service kiosk, it is recommended that there be dedicated lanes to direct customers for specific material types. This would allow customers to move through the queue more quickly. A disadvantage to dedicated lanes would be that customers with multiple material types would still need to be accommodated.

7.2.4 Widen Entrance Road and Keep Traffic on the "Correct" Side of the Road

It is recommended that the entrance road be widened to allow vehicles to enter on the right side of the road and avoid blocking the parking spaces during longer queue lengths. This will

improve safety by having traffic follow typical traffic patterns and allow more space for vehicles backing out of parking spaces.

7.2.5 Additional Transfer Trailers for E-waste Storage

It is recommended that one or two transfer trailers be utilized for the storage of E-waste to free up interior storage capacity, as shown in Appendix C. This option could be accomplished with or without a ramp or loading dock. Advantages of this option are the additional storage space it provides for as well as increased efficiency loading materials. The disadvantages are that the transfer trailers would require a significant amount of space and may require the elimination of other material collection.

7.2.6 Add a Road Around the Building

It is recommended that the County consider building a road to loop around the building and direct traffic in a circular pattern. This will greatly improve the traffic flow and safety of the participants. Traffic would move in a streamlined, one-way direction, reducing confusion, congestion, and the need for reversing vehicles as they move through the facility.

A high-level assessment considered the spatial requirements, setback standards, and environmental conditions (wetlands/floodplain), and determined there is adequate space on the property for the improvement. A desktop review of hydrologic conditions indicate that there are no wetlands or designated floodplain in the recommended location of the road. A portion of the onsite bioswales which is part of the facilities stormwater management system would be eliminated. Additional stormwater management improvements may need to be included due to the removal of part of the bioswale and the additional pavement (if impermeable).

7.2.7 Appointment System

It is recommended that the County consider implementing an appointment system at the Environmental Center to stagger participation throughout the day and limit high-volume occurrences. This system would only be necessary for certain material types such as HHW, E-waste, and problem materials. This would be a significant change from the current system and adequate education and outreach as well as a grace period would be required.

7.2.8 Cost Estimation for Option 2A

This Option was selected by the County staff to be further evaluated. Three concept design options were presented to the County and are presented in Appendix C. Option 2A was selected by the County staff. This option was selected by the County due to the exclusion of the recommendation to extend the road around the building as described in Section 7.2.6. The County expressed concerns about impacts to stormwater management from additional impervious pavement on the site and permitting challenges. Table 7-2 summarizes the estimated costs for implementation of Option 2Awith a rough order of magnitude cost estimation (+/-50%).

Table 7-2: Rough Order of Magnitude Cost Estimate for Option 2A

Item	Unit	Unit Cost	Quantity	Total Cost
New asphalt pavement	Square Yards	$150	240	$36,000
Curbing	Linear Feet	$50	150	$8,000
Pre-manufactured kiosk with service window, one desk	Square Feet	$400	144	$58,000
Electricity to kiosk via overhead connection from existing building	Lump Sum	$25,000	1	$25,000
Traffic crossing arm	Lump Sum	$15,000	1	$15,000
Road striping	Linear Feet	$2	1,000	$2,000
Traffic signage & Barriers	Lump Sum	$5,000	1	$5,000
Misc Site Demo/Repairs	Lump Sum	$10,000	1	$10,000
Grading/Earthwork for Pavement Extension	Cubic Yards	$80	160	$13,000
Total Direct Cost				**$180,000**
Construction Management & Indirect Costs				$65,000
Engineering				$50,000
Escalation (Not included, 2023 dollars)				$ -
Contingency		30%		$89,000
Contractor Fee		10%		$39,000
Option 1 Total Rough Order of Magnitude Cost				**$423,000**

7.3 Option 3 – New Facility

Option 3 includes the County developing a new facility to replace the existing facility. The location for this facility would need to shift to the west by about four miles to service the greatest population within a five-mile radius of the projected County population. This option meets the evaluation criteria as follows:

- **Location.** Location is recommended to shift to the west, as discussed in Section 3.0, Location Analysis.
- **Service availability**. Ability to maintain service offerings at a larger facility and continue to serve the growing population.
- **Capacity.** Capacity would be addressed through design to meet the projected service needs for the next 25 years and beyond.
- **Traffic and Safety.** Improved traffic flow and safety would be addressed through design.

- **Cost.** Capital costs would be significant.

7.3.1 Cost Estimation for Option 3

This option was selected by the County staff. It was assumed that the facility would be developed on an approximately 5-acre greenfield site to accommodate both customer and vendor traffic separately, and that the structure would be a pre-engineered metal building to include staff office space, restrooms, breakroom, meeting room, public swap shop, industrial space for material receiving, processing and storage, and a minimum of three loading docks. No costs for the acquisition of land is included in the cost estimate. Table 7-3 summarizes the estimated costs for Option 3 with a rough order of magnitude cost estimation (+/-50%). A greenfield site option was selected for developing the cost estimate due the variability of unknowns associated with a site with existing infrastructure. A minimum of 5 acres and a 14,000 square foot facility is recommended for a site with existing infrastructure.

Table 7-3: Rough Order of Magnitude Cost Estimate for Option 3

Item	Unit	Unit Cost	Quantity	Total Cost
Greenfield site	Acre		5	Not Included
Pre-Engineered Metal Building	Square Foot	$300	14,000	$4,200,000
Site Development	Square Foot	$100	14,000	$1,400,000
Total Direct Cost				**$5,600,000**
Construction Management & Indirect Costs		15%		$840,000
Engineering		10%		$560,000
Escalation (Not included, 2023 dollars)				$ -
Contingency		30%		$2,100,000
Contractor Fee		10%		$910,000
Total Option 1 Cost				**$10,010,000**

7.4 Option 4 – Add a Second Facility

Option 4 includes the addition of a second facility, similar or smaller in scale to the current Environmental Center such as a satellite facility to provide service to residents located further west. As discussed in Section 6.9.1, a single facility is sufficient for every 100,000 to 200,000 residents of urban and suburban areas. Since the population of the County is estimated to be around 161,000 residents by 2040, a second facility is not necessary for the current planning horizon for this Plan. Additionally, as described in Section 2.0, the County is not experiencing increased participation at mobile collection events or satellite facilities, which is typically a strong indicator of the need for a second facility. It is not recommended that the County move forward with this option at this time.

7.5 Option 5 – Current Facility Improvements and Host Additional Events

Option 5 includes remaining at the current facility, implementing the facility improvements, and hosting additional mobile collection events. By offering additional mobile collection events, the County will increase service offerings in the western portion of the County and can gauge demand for service based on participation over time. Currently, the primary demand in the County stems from increased participation at the Environmental Center, as opposed to at mobile collection events. Because of this, adding more mobile collection events may not be the preferred solution, however, offering an additional mobile collection event will allow the County to monitor the impact on participation and material quantities to determine future program needs in the western part of the County.

7.5.1 Cost Estimation for Option 5

This option was selected by the County staff for rough order of magnitude cost estimation. The average cost of a mobile collection event is approximately $15,000 per event per historical financial records provided.

7.6 Option 6 – Current Facility Improvements and Expand Service Offerings at Satellite Facilities

The satellite facilities currently accept a limited diversity of materials including used oil, oil filters, antifreeze, scrap metal, and comingled recyclables. Thus, the County could explore options to expand service offerings at these locations. The satellite facilities are owned and operated by the partnering host City/Townships and staff have limited training to handle HHW materials. Space is limited and would require site modifications to each satellite facility to accommodate for the collection, storage, and processing of HHW material. Additionally, permits may be required based on the change in materials handled if HHW was collected at those facilities. Due to the County's limited operational oversight of the satellite facilities and logistical challenges, this option is not being considered further.

8.0 Partnership Opportunities and Engagement

The Twin Cities Metropolitan Area (TCMA) provides a robust set of HHW collection programs. Each of the seven counties composing the Twin City Metropolitan Area have permanent household hazardous waste collection drop-off facilities with frequent collaboration to serve residents and small businesses within the region.

Both Hennepin and Scott Counties, which are adjacent to Carver County, have drop-off facilities for HHW, various problem materials, and select recyclable materials. Both of these counties accept materials from Carver County residents. Therefore, if a Carver County resident resides in closer proximity to a Hennepin or Scott County drop-off facility, the resident can drop-off materials at these facilities. This collaboration provides flexibility for residents and expanded service area coverage. During our site visit for the study, we confirmed that the Carver County HHW program will accept materials on a reciprocal basis from residents of these counties. The respective programs identify the specific county of origin for each customer and then invoices the respective county for the applicable costs. This type of collaboration appears to be routine within the TCMA.

The Minnesota Pollution Control Agency (MPCA) facilitates environmentally prudent management of HHW by encouraging local units of government to use the state of Minnesota's hazardous waste disposal contract through a cooperative purchasing approach. This statewide collaboration offers consistency in service and competitive pricing. Carver County participates in this program opportunity. In addition, the state of Minnesota does require specific training for HHW staff through the MPCA. Regional collaboration among the TCMA counties and their respective programs to ensure that training addresses management challenges would be beneficial. The Solid Waste Association Minnesota Chapter (SWANA) and the Minnesota Solid Waste Administrators Association (SWAA) also periodically offer conferences and webinars to discuss various HHW program technical issues and best practices from County staff throughout the state.

On a more informal basis, County staff share strategies and approaches to customer service and program management with other TCMA county staff. Formalizing this communication may offer benefits to addressing various issues such as state fire code changes, benchmarking program costs, and managing unique materials such as lithium batteries.

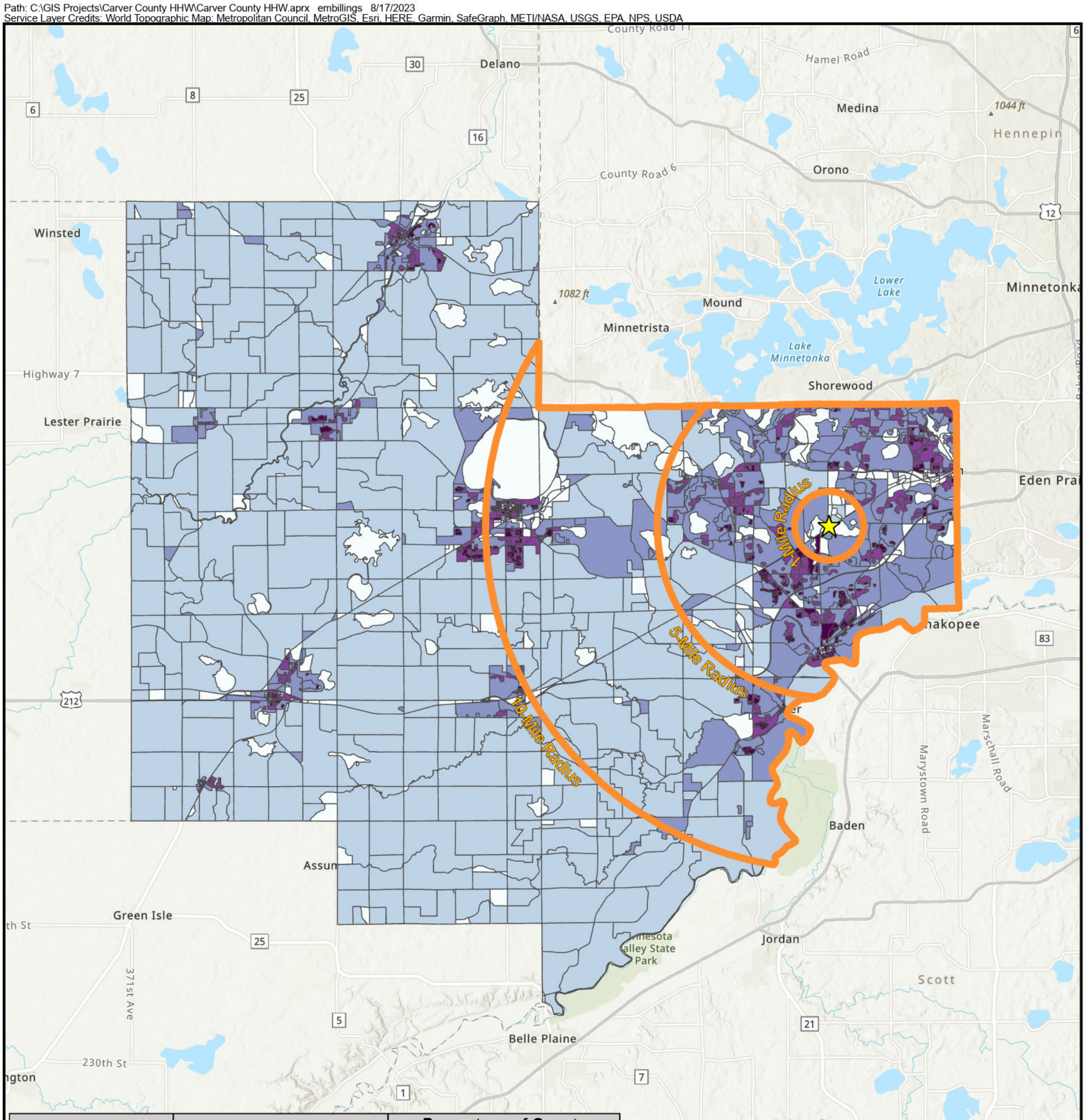
9.0 Future Services and Facility Plan

The current service offerings include the Environmental Center, Satellite Collection Facilities, and mobile events. Based on the above analysis, Burns & McDonnell recommends the following actions be considered for the future services and facility plan.

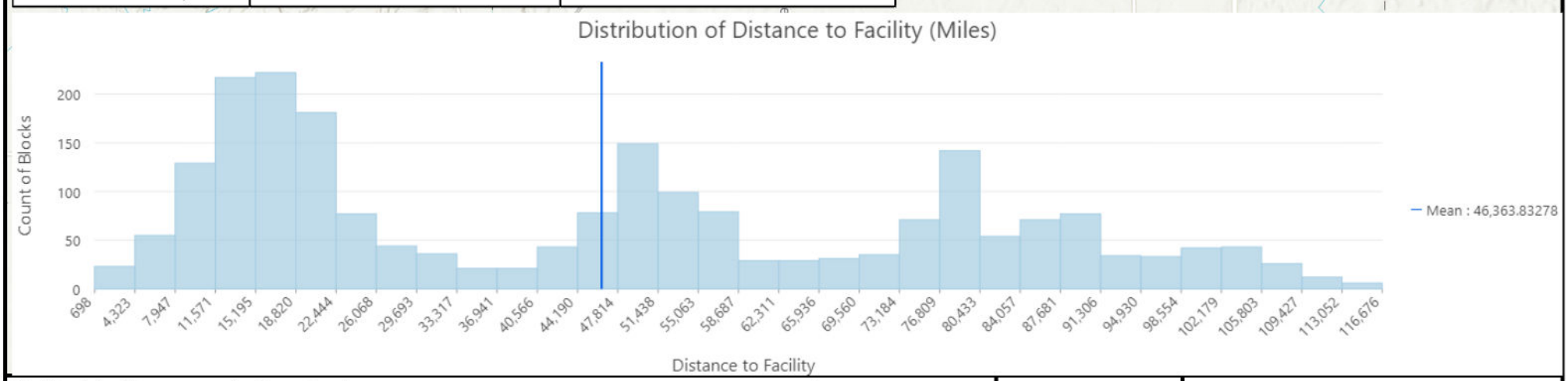
Item	Recommendation	Action Items
1	Implement operational improvements for safe handling and storage of lab pack items, bulking room, and Li batteries.	Standardize the practice of packing lab pack items under the ventilation hood.
		Install a ventilation hood at the flammable liquid bulking workstation.
		Update standard operating practices and eliminate the indoor storage of Li batteries overnight. Store Li batteries in a prefabricated 2-hr fire rated structure outdoors.
2	Develop a plan to discontinue the acceptance of commingled recyclable materials and source-separated cardboard at the Environmental Center.	Engage stakeholders through the update of the Solid Waste Management Plan.
		Explore partnerships with municipalities and townships, as well as the private sector, to host additional cardboard collection drop sites. At minimum, provide additional cardboard drop off locations in the eastern portion of the County through host arrangements (e.g., Chanhassen).
		Evaluate amending County Code of Ordinances, Title V, Chapter 50, to require haulers to offer curbside recycling throughout the entire County (not exclusive to municipalities). Provide notice to licensed solid waste haulers prior to the effective date.
		Develop and deploy a public education/ communications plan prior to implementation of new programs.
3	Consider recommended Environmental Center facility improvements.	Design and construct facility improvements including the traffic improvements (widen road at entrance, keep traffic on the correct side, road striping and signage, dedicated lanes for material types), point of service kiosk, and transfer trailer for storage of E-waste.
		Implement an appointment system through working with County IT department to build platform internally, or with an outside consultant. Develop and deploy a customer communications/education plan addressing program changes.
4	Host one additional special waste collection event in a western community to continue to evaluate demand.	Host one additional collection event and monitor the impact on participation and material quantities to determine future program needs in western part of County.
5	Re-evaluate the need for a new facility. Upon implementing the recommendations, the Environmental Center will likely meet the County's needs for the next 3-5 years.	Assess the physical condition of the facility and assets.
		Review population growth and program participation at the Environmental Center, satellite facilities, and mobile events and revisit the need for a new facility.

APPENDIX A – MAPS

Path: C:\GIS Projects\Carver County HHW\Carver County HHW.aprx embillings 8/17/2023
Service Layer Credits: World Topographic Map: Metropolitan Council, MetroGIS, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA



Geography	Sum of Block Population	Percentage of County Population
Carver County	106,922	100%
1-Mile Radius from HHW Facility	1,271	1.19%
5-Mile Radius from HHW Facility	65,132	60.92%
10-Mile Radius from HHW Facility	81,931	76.63%



Total Population / Acres
- 0.000
- 0.00010000 - 0.1473
- 0.1474 - 3.866
- 3.867 - 7.978
- 7.979 - 67.19

Carver County HHW Site
Carver County Buffers

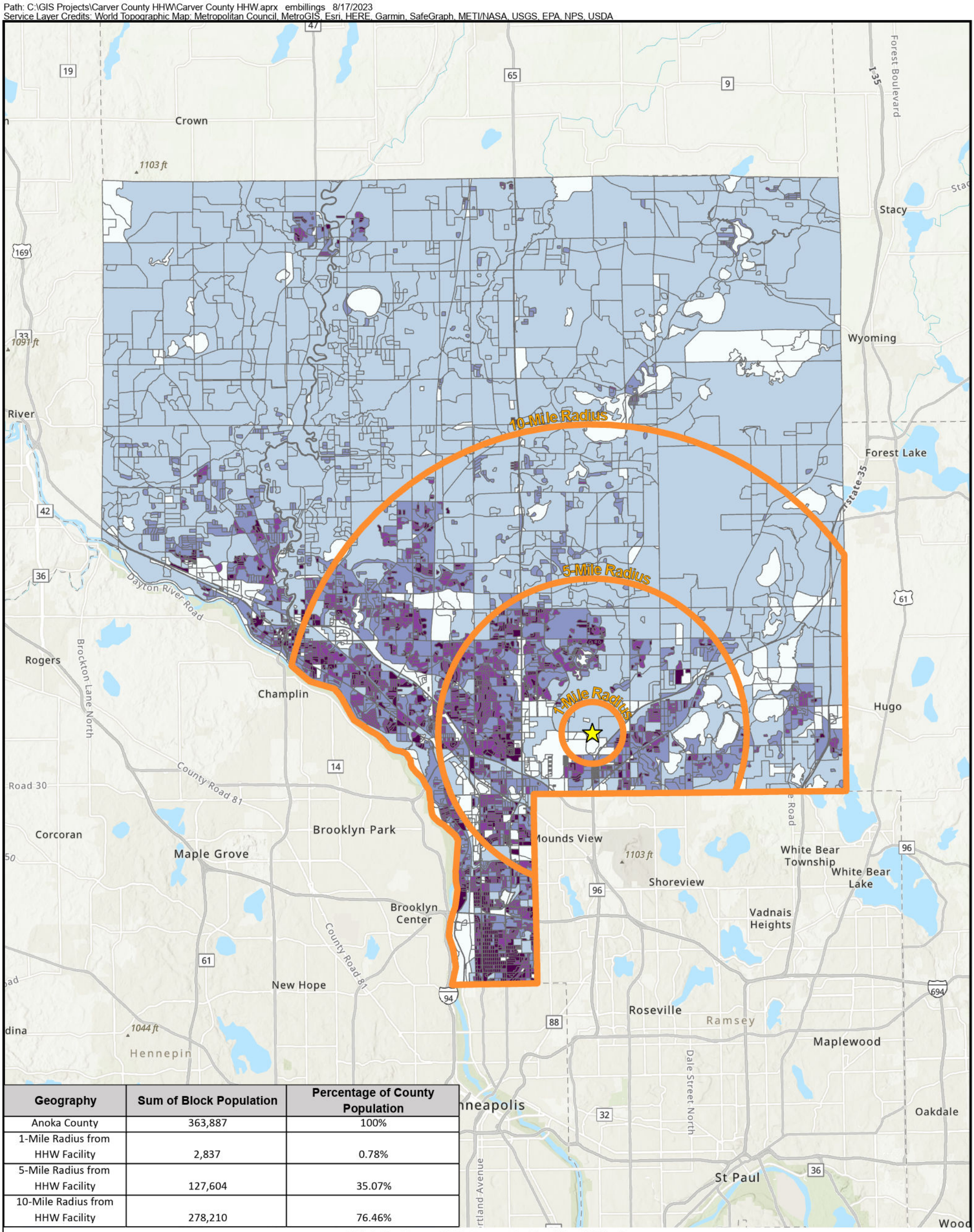
NORTH
3 1.5 0 3
Miles

BURNS McDONNELL

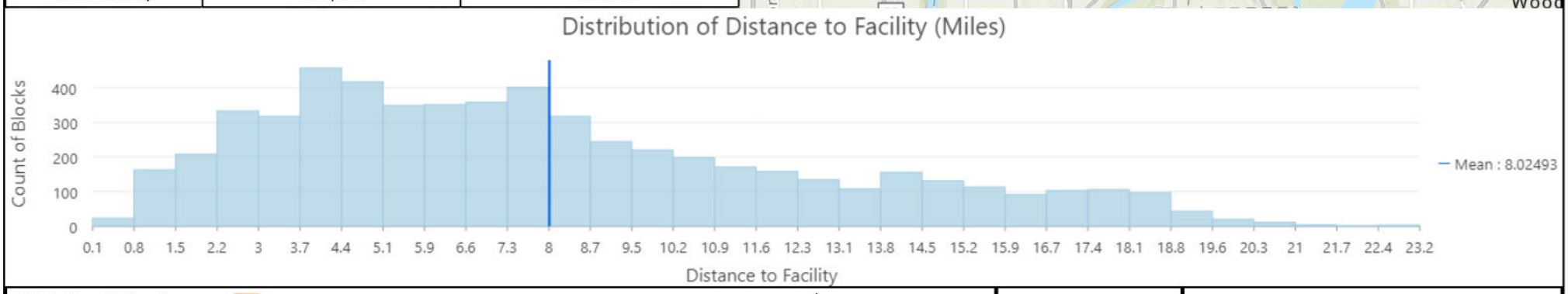
Carver County HHW Study
Percentage of Population From Carver County Environmental Center Facility

Source:
Issued: 8/17/2023

Path: C:\GIS Projects\Carver County HHW\Carver County HHW.aprx embillings 8/17/2023
Service Layer Credits: World Topographic Map: Metropolitan Council, MetroGIS, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA



Geography	Sum of Block Population	Percentage of County Population
Anoka County	363,887	100%
1-Mile Radius from HHW Facility	2,837	0.78%
5-Mile Radius from HHW Facility	127,604	35.07%
10-Mile Radius from HHW Facility	278,210	76.46%



Total Population / Acres
- 0.000
- 0.00010000 - 1.649
- 1.650 - 5.914
- 5.915 - 9.210
- 9.211 - 106.1

- Anoka County Buffers
- Anoka County HHW Site

NORTH
3 1.5 0 3
Miles

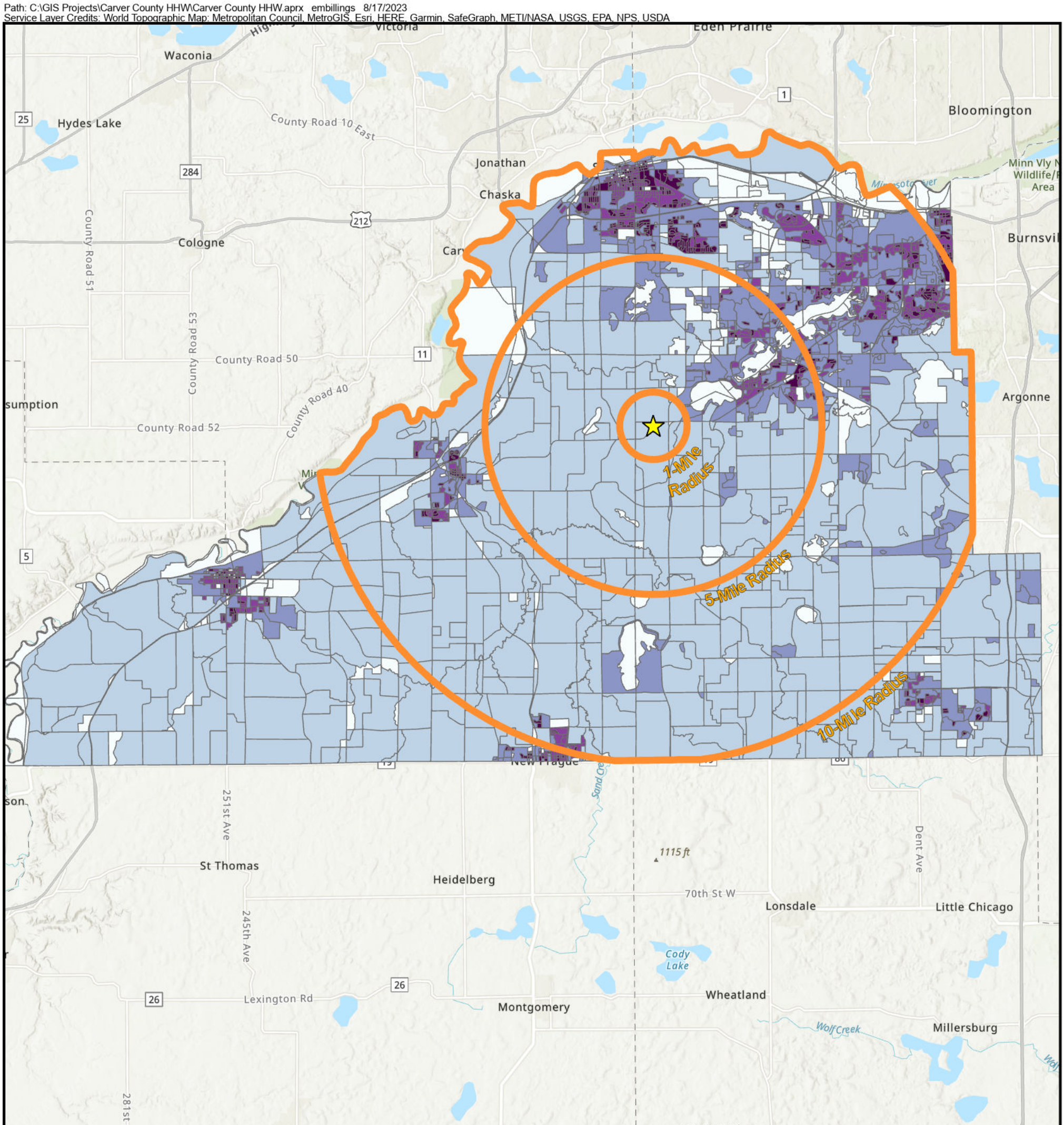
BURNS McDONNELL

Carver County HHW Study
Percentage of Population From Anoka County HHW Facility

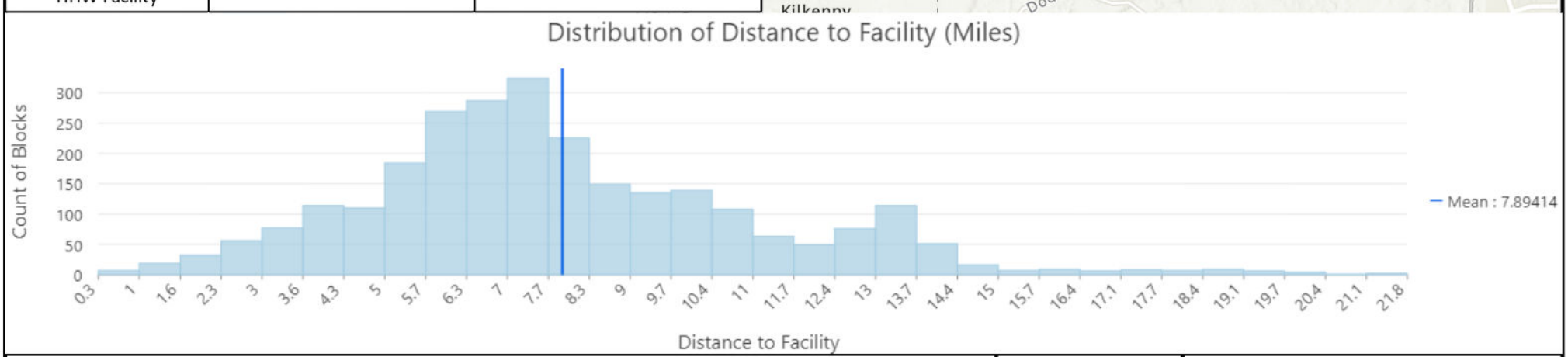
Source:

Issued: 8/17/2023

Path: C:\GIS Projects\Carver County HHW\Carver County HHW.aprx embillings 8/17/2023
Service Layer Credits: World Topographic Map: Metropolitan Council, MetroGIS, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA



Geography	Sum of Block Population	Percentage of County Population
Scott County	150,928	100%
1-Mile Radius from HHW Facility	121	0.08%
5-Mile Radius from HHW Facility	28,085	18.61%
10-Mile Radius from HHW Facility	128,139	84.90%



Total Population / Acres
- 0.000
- 0.00010000 - 0.5167
- 0.5168 - 4.663
- 4.664 - 8.357
- 8.358 - 57.17

Scott County HHW Site
Scott County Buffers

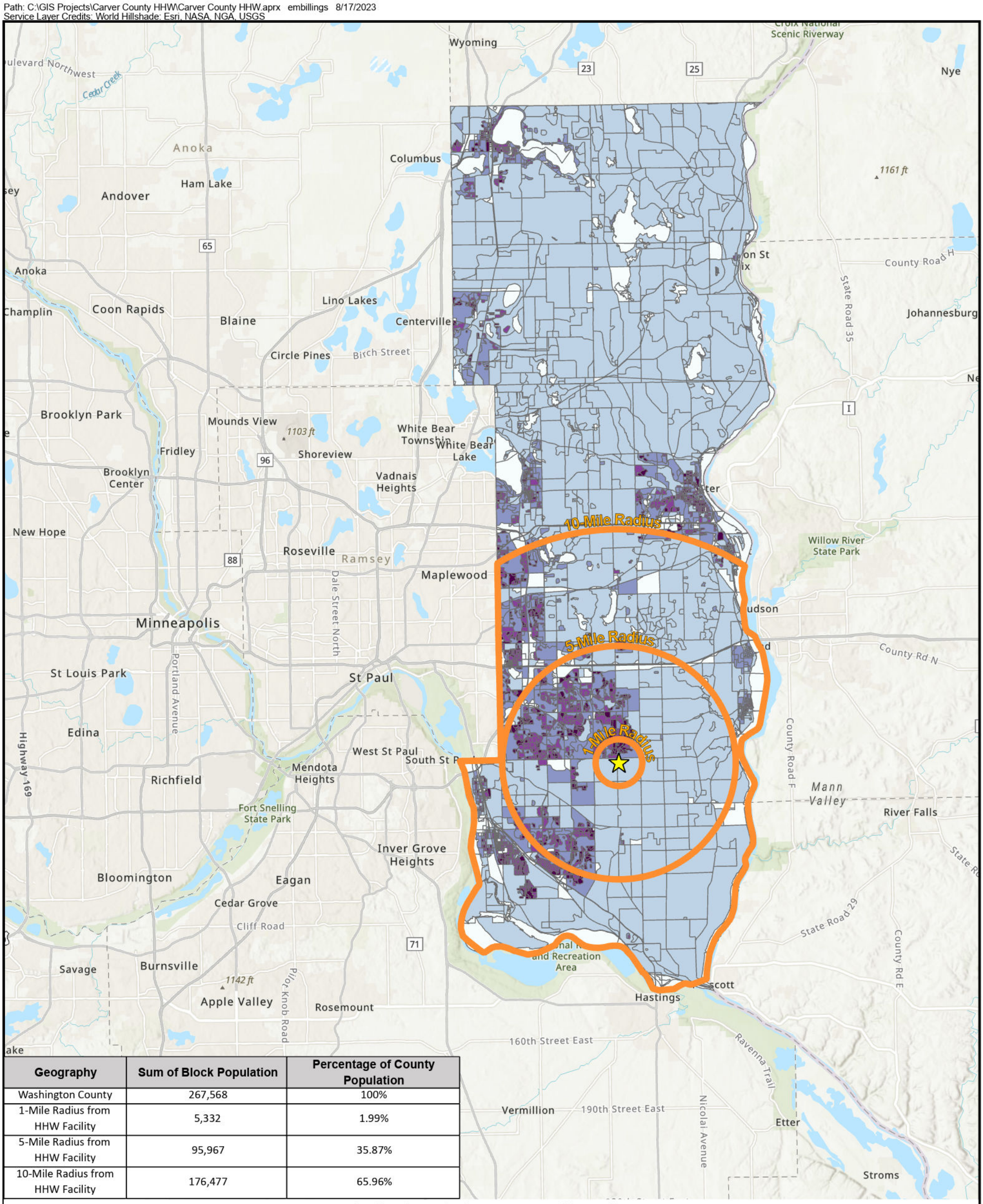
NORTH
3 1.5 0 3
Miles

BURNS McDONNELL

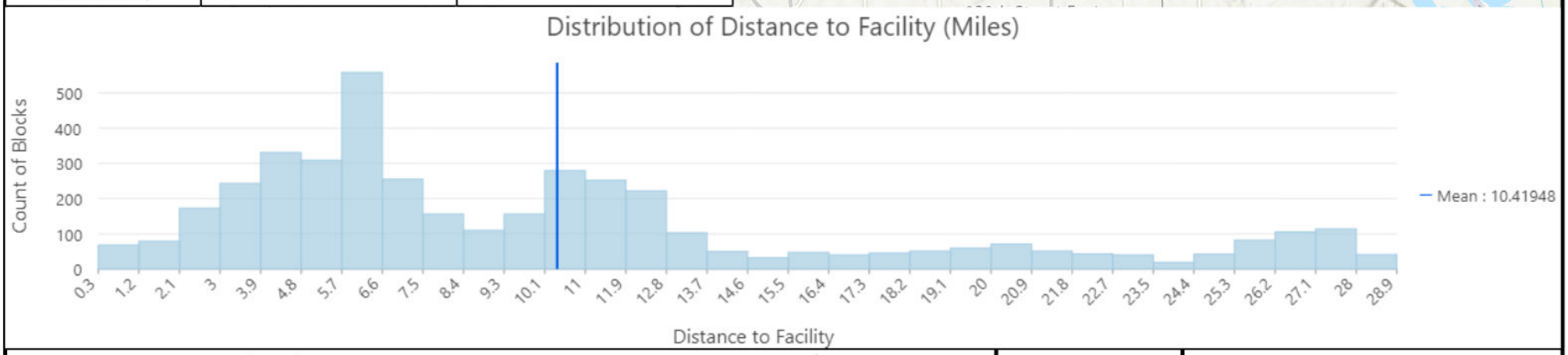
Carver County HHW Study
Percentage of Population From Scott County HHW Facility

Source:
Issued: 8/17/2023

Path: C:\GIS Projects\Carver County HHW\Carver County HHW.aprx embillings 8/17/2023
Service Layer Credits: World Hillshade: Esri, NASA, NGA, USGS



Geography	Sum of Block Population	Percentage of County Population
Washington County	267,568	100%
1-Mile Radius from HHW Facility	5,332	1.99%
5-Mile Radius from HHW Facility	95,967	35.87%
10-Mile Radius from HHW Facility	176,477	65.96%



Total Population / Acres
- 0.000
- 0.00010000 - 1.661
- 1.662 - 5.567
- 5.568 - 8.716
- 8.717 - 121.1

- Washington County HHW Site
- Washington County Buffers

NORTH
4 2 0 4
Miles

BURNS McDONNELL

Carver County HHW Study
Percentage of Population From Washington County HHW Facility

Source:

Issued: 8/17/2023

APPENDIX B – WASHINGTON STATE FIRE CODE SECTION 322 – LITHIUM ION BATTERIES

WASHINGTON STATE BUILDING CODE

CHAPTER 51-54A

2021 Edition

Washington State Amendments to the

2021 INTERNATIONAL FIRE CODE

Washington State Building Code Council

322.1 General. The storage of lithium-ion and lithium metal batteries shall comply with Section 322.

EXCEPTIONS: 1. New or refurbished batteries installed in the equipment, devices, or vehicles they are designed to power.

2. New or refurbished batteries packed for use with the equipment, devices, or vehicles they are designed to power.

3. Batteries in original retail packaging that are rated at 300 watt-hours or less for lithium-ion batteries or contain 25 grams or less of lithium metal for lithium metal batteries.

4. Temporary storage of batteries or battery components during the battery manufacturing process prior to completion of final quality control checks.

5. Temporary storage of batteries during the vehicle manufacturing or repair process.

322.2 Permits. Permits shall be required for an accumulation of more than 15 cubic feet (0.42 m) of lithium-ion and lithium metal batteries, other than batteries listed in the exceptions to Section 322.1, as set forth in Section 105.5.14.1.

322.3 Fire safety plan. A fire safety plan shall be provided in accordance with Section 403.10.6. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

322.4 Storage requirements. Lithium-ion and lithium metal batteries shall be stored in accordance with Section 322.4.1, 322.4.2, or 322.4.3, as applicable.

322.4.1 **Limited indoor storage in containers.** Not more than 15 cubic feet (0.42 m) of lithium-ion or lithium metal batteries shall be permitted to be stored in containers in accordance with the following:

1. Containers shall be open-top and constructed of noncombustible materials or shall be approved for battery collection.
2. Individual containers and groups of containers shall not exceed a capacity of 7.5 cubic feet (0.21 m).
3. A second container or group of containers shall be separated by not less than 3 feet (914 mm) of open space, or 10 feet (3048 mm) of space that contains combustible materials.
4. Containers shall be located not less than 5 feet (1524 mm) from exits or exit access doors.

322.4.2 **Indoor storage areas.** Indoor storage areas for lithium-ion and lithium metal batteries, other than those complying with Section 322.4.1, shall comply with Sections 322.4.2.1 through 322.4.2.6.

322.4.2.1 Technical opinion and report. Where required by the fire code official a technical opinion and report complying with Section 104.8.2 shall be prepared to evaluate the fire and explosion risks associated with the indoor storage area and to make recommendations for fire and explosion protection. The report shall be submitted to the fire code official and shall require the fire code official's approval prior to issuance of a permit. In addition to the requirements of Section 104.8.2, the technical opinion and report shall specifically evaluate the following:

1. The potential for deflagration of flammable gases released during a thermal runaway event.
2. The basis of design for an automatic sprinkler system or other approved fire suppression system. Such design basis shall reference relevant full-scale fire testing or another approved method of demonstrating sufficiency of the recommended design.

Insert Page 3-14

322.4.2.2 Construction requirements. Where indoor storage areas for lithium-ion and lithium metal batteries are located in a building with other uses, battery storage areas shall be separated from the remainder of the building by 2-hour rated fire barriers or horizontal assemblies. Fire barriers shall be constructed in accordance with Section 707 of the International Building Code, and horizontal assemblies shall be constructed in accordance with Section 711 of the International Building Code.

EXCEPTIONS: 1. Where battery storage is contained in one or more approved prefabricated portable structures providing a complete two-hour fire resistance rated enclosure, fire barriers and horizontal assemblies are not required.

2. Where battery storage is limited to new batteries in packaging that has been demonstrated to and approved by the fire code official as sufficient to isolate a fire in packaging to the package interior, fire barriers and horizontal assemblies are not required.

322.4.2.3 Fire protection systems. Indoor storage areas for lithium-ion and lithium metal batteries shall be protected by an automatic sprinkler system complying with Section 903.3.1.1 or an approved alternative fire suppression system. The system design shall be based on recommendations in the approved technical opinion and report required by Section 322.4.2.1.

322.4.2.4 Fire alarm systems. Indoor storage areas for lithium-ion and lithium metal batteries shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use air-aspirating smoke detection, radiant energy-sensing fire detection, or both.

322.4.2.5 Explosion control. Where the approved technical opinion and report required by Section 322.4.2.1 recommends explosion control, explosion control complying with Section 911 shall be provided.

322.4.2.6 Reduced requirements for storage of partially charged batteries. Indoor storage areas for lithium-ion and lithium metal batteries with a demonstrated state of charge not exceeding 30 percent shall not be required to comply with Section 322.4.2.1, 322.4.2.2, or 322.4.2.5, provided that procedures for limiting and verifying that the state of charge will not exceed 30 percent have been approved.

322.4.3 **Outdoor storage.** Outdoor storage of lithium-ion or lithium metal batteries shall comply with Sections 322.4.3.1 through 322.4.3.3.

322.4.3.1 Distance from storage to exposures. Outdoor storage of lithium-ion or lithium metal batteries, including storage beneath weather protection in accordance with Section 414.6.1 of the International Building Code, shall comply with one of the following:

1. Battery storage shall be located not less than 20 feet (6096 mm) from any building, lot line, public street, public alley, public way, or means of egress.
2. Battery storage shall be located not less than 3 feet (914 mm) from any building, lot line, public street, public alley, public way, or means of egress, where the battery storage is separated by a 2-hour fire- resistance rated assembly without openings or penetrations and extending 5 feet (1524 mm) above and to the sides of the battery storage area.
3. Battery storage shall be located not less than 3 feet (914 mm) from any building, lot line, public street, public alley, public way, or means of egress, where batteries are contained in approved prefabricated portable structures providing a complete 2-hour fire-resistance rated enclosure.

322.4.3.2 Storage area size limits and separation. Outdoor storage areas for lithium-ion or lithium metal batteries, including storage beneath weather-protection in accordance with Section 414.6.1 of the International Building Code, shall not exceed 900 sq. ft (83.6 m). The height of battery storage in such areas shall not exceed 10 feet (3048 mm). Multiple battery storage areas shall be separated from each other by not less than 10 feet (3048 mm) of open space.

322.4.3.3 Fire detection. Outdoor storage areas for lithium-ion or lithium metal batteries, regardless of whether such areas are open, under weather protection or in a prefabricated portable structure, shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use radiant energy-sensing fire detection.

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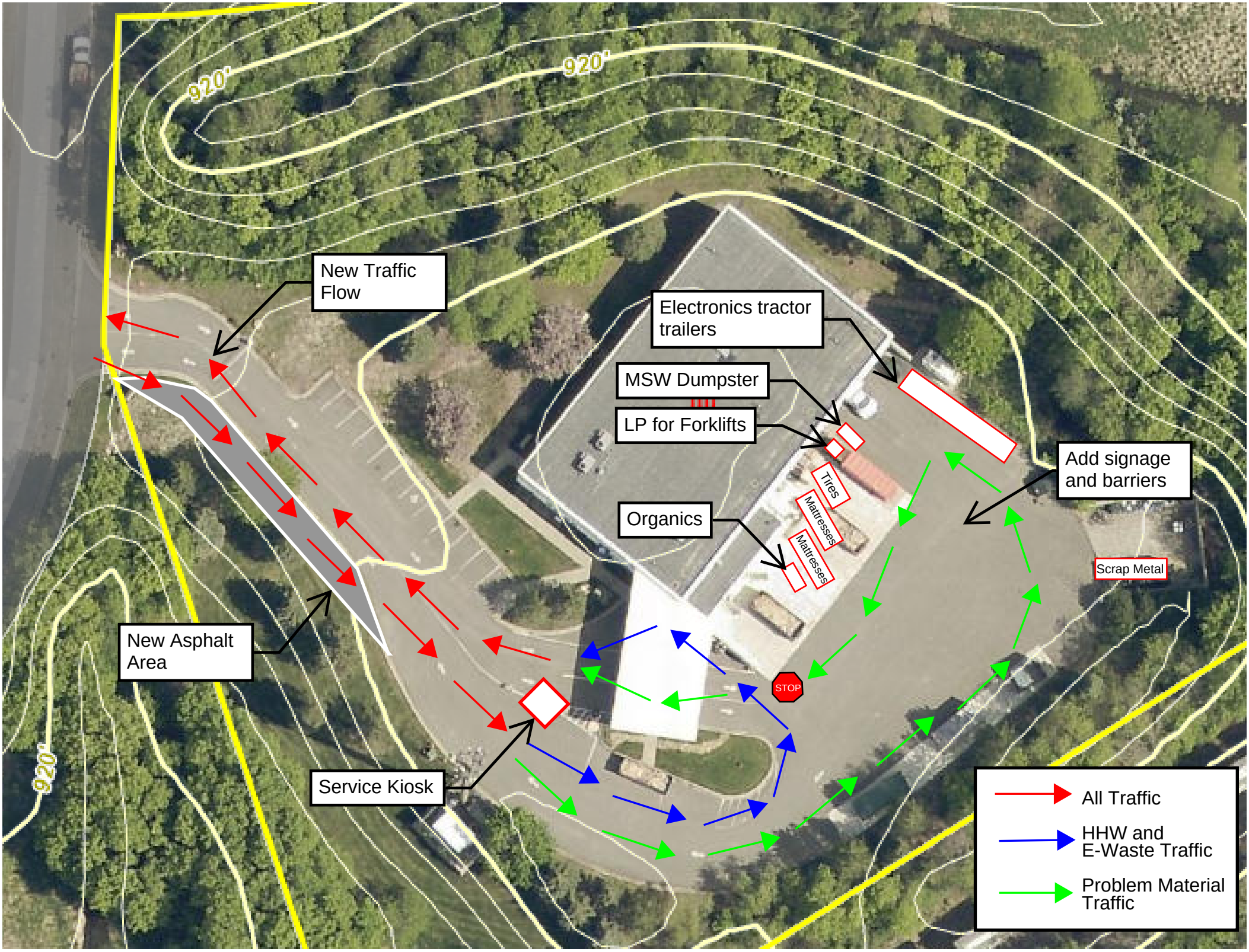
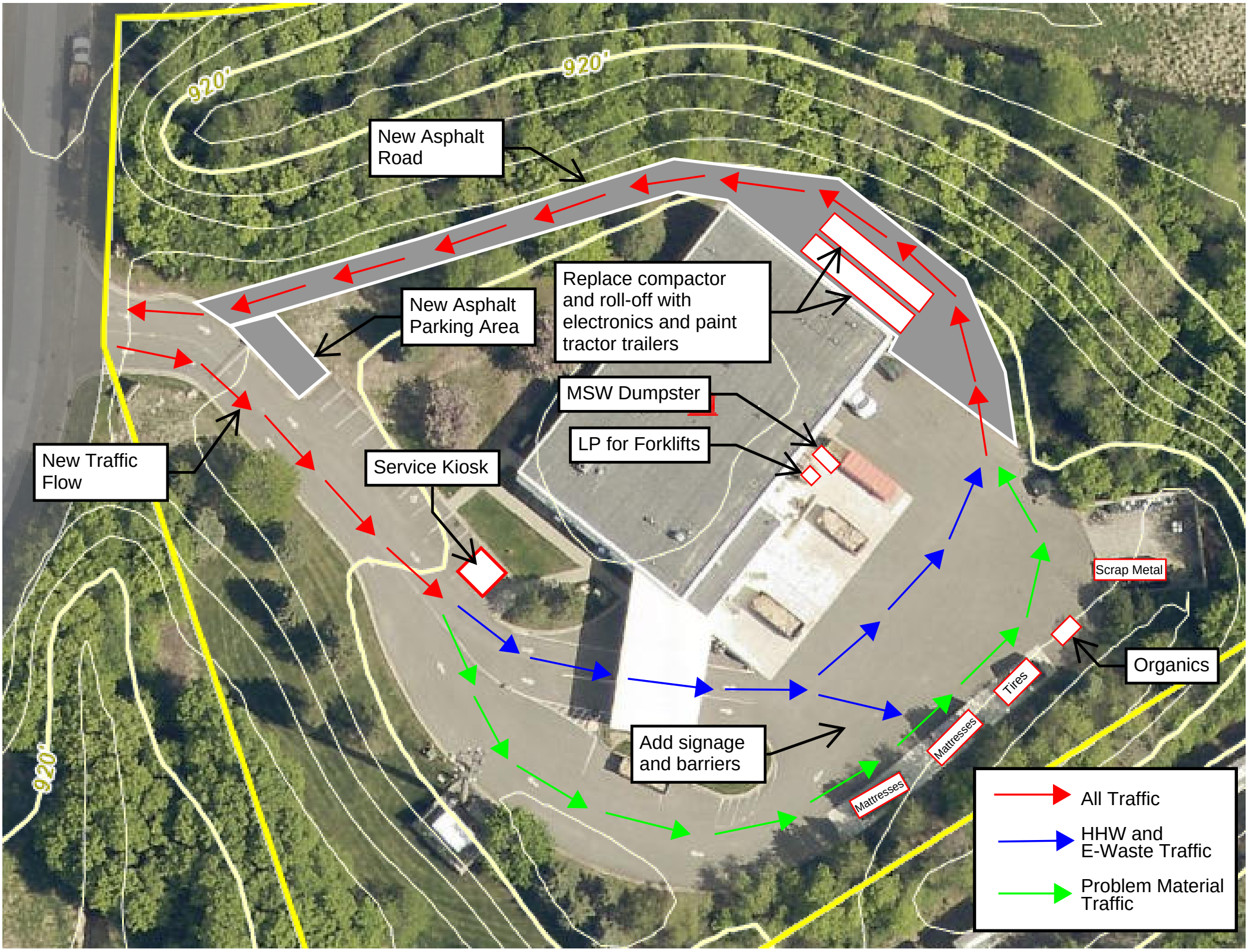
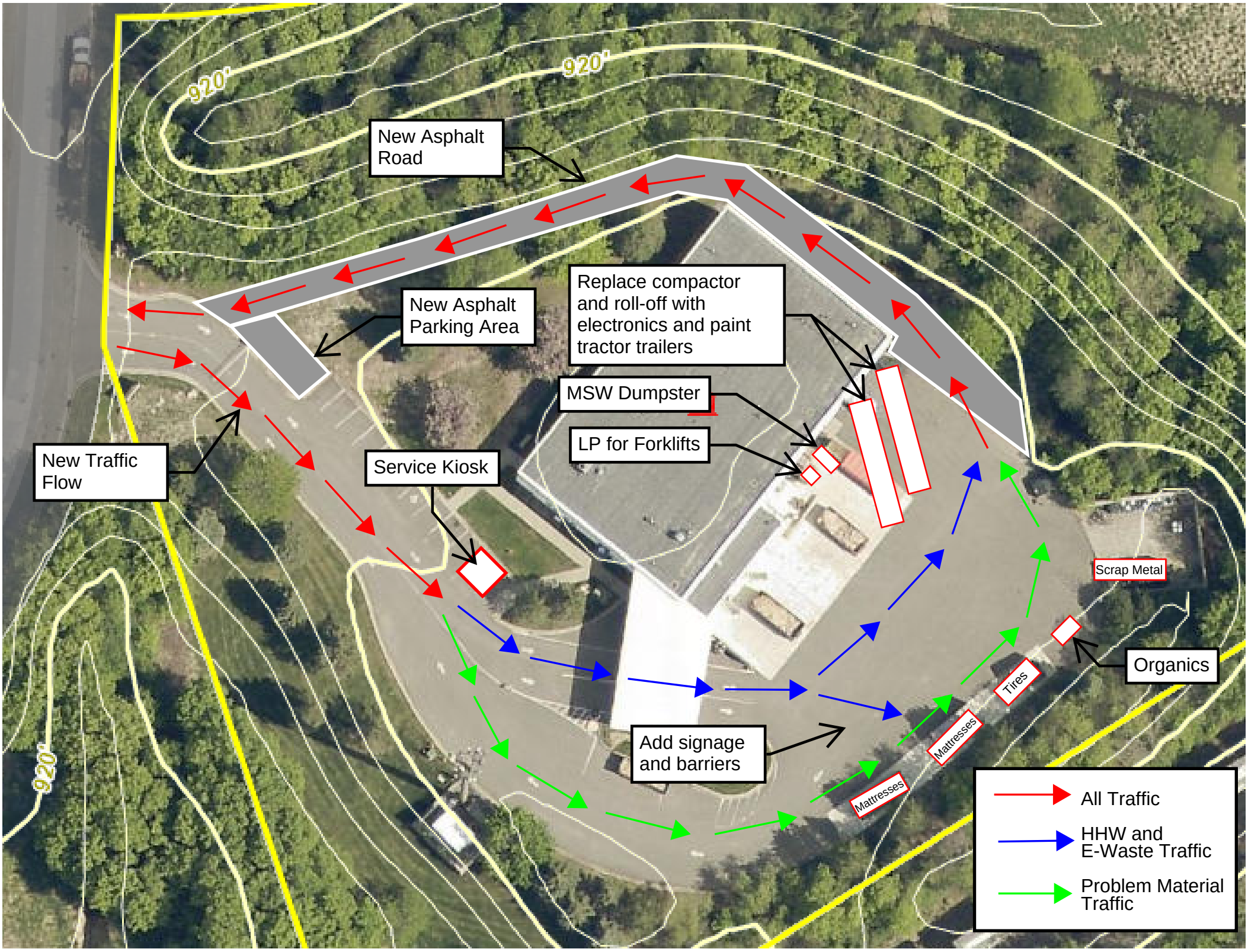
APPENDIX C – ENVIRONMENTAL CENTER SITE IMPROVEMENT CONCEPT DESIGN OPTIONS


920'
920'
920'
New Traffic Flow
Electronics tractor trailers
MSW Dumpster
LP for Forklifts
Add signage and barriers
Tires
Mattresses
Mattresses
Organics
Scrap Metal
New Asphalt Area
STOP
Service Kiosk
All Traffic
HHW and E-Waste Traffic
Problem Material Traffic


920'
920'
920'
New Asphalt Road
New Asphalt Parking Area
Replace compactor and roll-off with electronics and paint tractor trailers
MSW Dumpster
LP for Forklifts
New Traffic Flow
Service Kiosk
Add signage and barriers
Scrap Metal
Organics
Tires
Mattresses
Mattresses
All Traffic
HHW and E-Waste Traffic
Problem Material Traffic


920'
920'
920'
New Asphalt Road
New Asphalt Parking Area
Replace compactor and roll-off with electronics and paint tractor trailers
MSW Dumpster
LP for Forklifts
New Traffic Flow
Service Kiosk
Add signage and barriers
Scrap Metal
Organics
Tires
Mattresses
Mattresses
All Traffic
HHW and E-Waste Traffic
Problem Material Traffic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