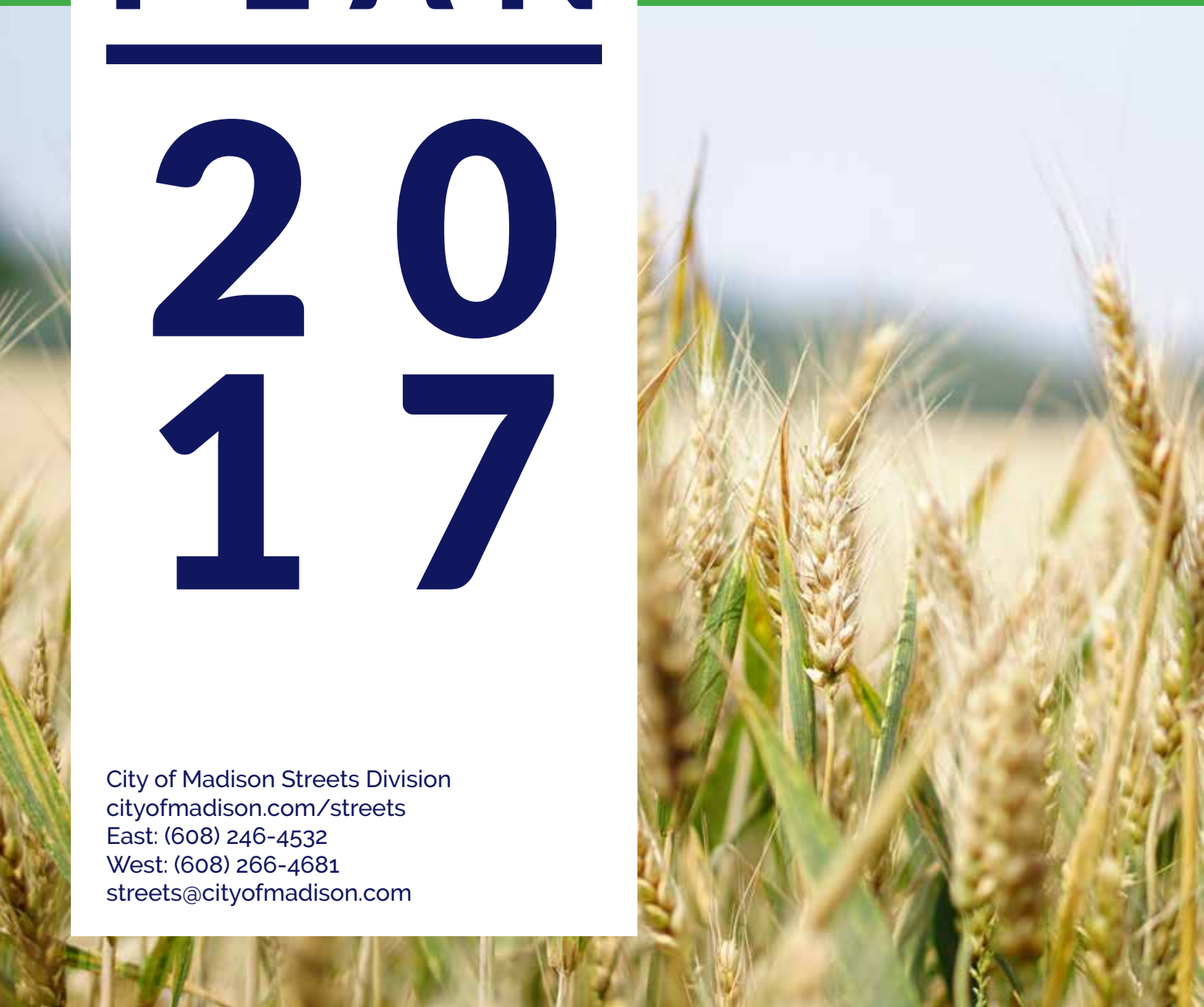
SOLID WASTE PLAN

2017



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Section 1 – Why Maximize Recycling?

The City of Madison started diverting recyclables from the landfill long before the Recycling Act of 1991. The City's recycling program began with recycling bundled newspaper back in 1968. Over time, the City's recycling efforts expanded greatly, offering opportunities to recycle plastic, metal, glass, and mixed paper in home collection carts and additional items at the drop-off sites, like electronics, household batteries, and Styrofoam. In 2016, City efforts have led the recycling and diverting of over 110,000 tons of material from the landfill.

Our success does not mean the work is done. In 2016, over 185,000 tons of waste material was generated from the City of Madison – meaning at least 75,000 tons of stuff from City of Madison residents was sent to the landfill. We can do better.

Landfills, including the Dane County Landfill, which is the one Madison currently uses for our unwanted junk, have a finite amount of space. More landfill space will only be achieved by transforming some of the best farmland in the world into a place to bury unwanted items. Developing a new landfill is also a lengthy, very expensive and politically sensitive process. Plus, any future site is also likely to be located farther away from Madison, which increases all the costs associated with hauling, dumping, and transporting material—and this does not include the environmental impact such a development would undoubtedly have. Therefore, the need to delay or forestall the development of new landfill space is clear.

These truths regarding landfills and Madison's long commitment to recycling led Madison's Sustainability Plan and the Madison Results initiative to set down a lofty challenge for the City: zero waste by 2050.

The term "zero waste" has many potential definitions. Madison's definition of zero waste will be to send zero recyclable waste to the landfill. This means the City will commit to taking advantage of each practical opportunity that is available to stop material from being sent to the landfill.

The Solid Waste Plan recognizes that some waste materials, such as disposable diapers and pet waste, are currently not recyclable or preventable at the municipal level. The plan also acknowledges that the term recyclable will be ever-shifting, as recycling technology changes along with changes to the waste stream and to the products we consume.

We must also recognize that recyclable materials are a global commodity. For something to be recycled, there must be marketplace that will accept and process it. Since recycling is dependent upon the whims of the marketplace, there will be times when political actors or sea changes in consumer behavior will undermine previously established recyclable items. For example, in 2017 the rigid plastic recycling program at Madison's drop-off sites was suspended in response to an import ban instituted by China on plastic scrap. China was the end-market for the mixed plastic bales produced by the rigid plastic recycling program. With this end market no longer available, the program had to be suspended until another market could be located. While market forces can lead to negative changes such as the discontinuation of the rigid plastic recycling program, they can also lead to positive changes. For example, container manufacturers lead the charge to be sure gable-top cartons that hold broth and other liquid food products can be captured at recovery facilities and recycled. Therefore, this plan also recognizes that there are global forces beyond municipal control that can steer the recyclability of items.

We also must recognize that technological advancements will undoubtedly cause significant changes to the services provided by the Streets Division. For example, autonomous cars will likely change how drop-off services can be delivered, and they have the potential to impact how curbside collection services are provided. We must also consider that more and more battery-powered items will be entering the marketplace, so ensuring access to battery recycling options will grow more important with each passing year—assuming, of course, market forces do not shift consumer demand elsewhere.

This plan cannot account for every potential change or pivot within the worldwide recycling market, but it can, and does, reiterate a commitment to responding to the challenge of a shifting world. There may be a time when presently non-recyclable items, like a disposable diaper, can be diverted from the landfill, so as a city we must maintain our flexibility to seize such opportunities and maintain our aspirations for all waste material being recyclable or preventable.

Overall, our recycling system must be resilient, responsive, and resolute in order to adapt to the changes to the waste stream caused by technology, the global market, and consumers.

Finally, this plan is meant to offer near-term steps that honor the City's commitment to achieving our definition of zero waste by maximizing recycling at any given moment, and honoring the values residents place on a solid waste collection system, and more generally the values and history the city as a whole must strive to represent.

Section 2 – Values

The Solid Waste Advisory Committee developed a list of values that reflect what residents and visitors of the City of Madison expect from a high quality solid waste service.

These seven values are defined below and this plan seeks to reflect these values.

1

Safety

Solid waste services must be performed in a safe manner for both workers and residents.

2

Environment

Solid waste service providers, namely the Streets Division, are expected to be responsible stewards of the environment, and must strive to minimize the impact waste has upon it by promoting recycling and waste diversion, while also ensuring the operations of the solid waste services are minimally impactful on the environment.

3

Convenience

In order for solid waste services to be effective for the public, they must be easy to understand and easy to access.

4

Aesthetics

In addition to the important role solid waste services play in the health of a community, how these services impact and maintain the look of neighborhoods cannot be ignored or under-emphasized, since it is these impressions that shape opinions of neighborhoods and delivered services.

5

Public Health

Reliable, effective, and safe solid waste collection and disposal is a cornerstone of civilization, and any change to how solid waste is collected must first be evaluated in terms of how it could impact public health.

6

Practicality

Solid waste services function best when the services and opportunities are reasonable to perform, cost effective to enact, and have low barriers to achieving full compliance.

7

Community Values

Solid waste services must reflect what residents want from said services by providing opportunities for community engagement around them in order to foster a deeper relationship with and understanding of these services.

Section 3 – Lenses

As part of the City's Comprehensive Plan initiative—also called Imagine Madison—four lenses were identified as areas that City efforts can work to improve for Madison residents.

The Solid Waste Plan will address these lenses as outlined below.

Equity

The Streets Division is committed to providing equitable opportunities for solid waste services to ensure neighborhoods receive the services they need to meet their solid waste requirements.

Health

The Streets Division's solid waste services play an integral role in maintaining the well-being of Madison's residents, neighborhoods, and lakes. This plan recognizes the Streets Division's role in maintaining and improving them.

Sustainability

The Streets Division is the leading agency for Madison's goal of being more environmentally responsible, and this plan will reveal ways the Streets Division can continue to provide leadership and direction for the city.

Adaptability

Madison's changing boundaries and demographics will stress the ability of the Streets Division to provide equitable services. Changing markets forces will adjust the recyclability of items. And the changing climate will impact solid waste services provided by the Streets Division, particularly yard waste and brush collection since those services are weather dependent. This plan will show how the Streets Division will remain flexible and able to respond to an ever-shifting future.

Imagine Madison

Section 4 – Diversion Goals

This plan aims to produce the following diversion goals:

YEAR	WASTE DIVERTED FROM LANDFILL
2016	58%
2020	65%
2025	70%
2030	75%
2035	80%
2040	85%
2045	90%
2050	100%

By the year 2050, 100% diversion will result in Zero Recyclable Waste.

This table breaks down the Streets Division's collection and recycling/composting tonnage for the year 2016 for different categories of material.

MATERIAL	TONS COLLECTED	TONS RECYCLED/ COMPOSTED	% DIVERTED
Refuse	44,866.15	0.00	0.00%
Large Items	7,664.71	3,636.09	47.44%
Recyclables	20,518.88	19,378.99	94.44%
Leaf Collection	15,774.36	15,774.36	100.00%
Yard Waste Drop-Off	3,036.67	3,036.67	100.00%
Brush	17,208.49	17,208.49	100.00%
Home Composting	7,076.85	7,076.85	100.00%
In House Metal	108.31	108.31	100.00%
Waste Oil	72.31	72.31	100.00%
Oil Filters	3.22	3.22	100.00%
Rigid Plastic	132.70	132.70	100.00%
Tires	39.20	39.20	100.00%
Computers/Electronics	358.56	358.56	100.00%
Move-Out ReUse	65.90	65.90	100.00%
Madison Stuff Exchange	12.74	12.74	100.00%
Styrofoam	20.96	20.96	100.00%
Vehicle Batteries	26.06	26.06	100.00%
Household Batteries	7.21	7.21	100.00%
Shoes/Textiles	4.84	4.84	100.00%
Construction & Demolition	69,872.79	42,027.42	60.15%
Organics Program	334.32	334.32	100.00%
Monona Terrace Composting	22.40	22.40	100.00%
Parks/Mall Recycling	45.39	45.39	100.00%
Mattresses & Box Springs	207.28	207.28	100.00%
Total	**187,273.02**	**109,392.98**	**58.41%**

For additional context, the material categories listed in the chart are defined as follows:

Refuse

This includes material collected by the Streets Division from the tan refuse carts. Refuse tonnage also includes material collected by other agencies, such as the Parks Division and the Madison Metropolitan School District, and refuse collected at large city festivals, such as FreakFest, and the weekly Dane County Farmers' Market.

Large Items

This is material collected from the curb by the Streets Division's large item collection vehicles. Large items can be any item too large for the refuse collection cart. The reported tonnage also includes material collected at the drop-off sites in the wood containers and in the rear-loading truck used to collect a mixture of large items and refuse.

The recycled fraction listed in the chart stems from wood items, either collected at the curb or taken to our drop-off site. Discarded wood products are repurposed as road base at the landfill, which is considered recycling.

Recyclables

The reported tonnage is from the green recycling carts that are collected from the curb by the Street Division's trucks, and also material that is placed into a recycling collection vehicle at the drop-off facilities.

Leaf Collection

This is yard waste material collected primarily by Streets Division crews at the curb. Other agencies, such as the Community Development Authority, contribute a comparatively insignificant tonnage of material.

Yard waste material is not typically weighed by Streets Division crews as there is no scale available at the composter that receives the yard waste. Instead, an estimate is necessary to get this weight. One rear-loading vehicle can hold, on average, 8 tons of yard waste material and the number of loads delivered to the composter is tracked.

The weight reported reflects the estimate plus the actual weights from instances where yard waste was weighed at the Streets Division's transfer station.

Yard Waste Drop-Off

This is yard waste material delivered to a drop-off site by residents throughout the year. Again, a combination of estimates and actual weights was used to derive this number.

Brush

Brush is material trimmed from trees and bushes that have been collected curbside by Streets Division crews using tow-behind wood chippers and truck-mounted cranes. This number also includes brush delivered by homeowners to the drop-off sites, and by contractors to the brush processing center. The reported tonnage includes brush created by Forestry's operations. Brush is processed with an industrial wood chipper and resold or reused as mulch.

Home Composting

This is the estimated tonnage of material composted at home by residents of Madison based on the previous year and the number of homeowners who purchased a compost barrel from the annual compost bin sale at the Alliant Energy Center.

In House Metal

This is the reported tonnage of metal produced and recycled from City of Madison operations by various departments, such as the Water Utility and Engineering Division.

Waste Oil

This is the reported tonnage of used motor oil collected from the public drop-off points. The Engineering Division oversees these drop-off points, and the oil is recycled by a private contractor.

Oil Filters

This number reflects the tonnage of oil filters also collected at the waste oil drop-off points that are managed by the Engineering Division.

Rigid Plastic

This is the tonnage of mixed rigid plastic material comprised of a variety of different plastic chemistries that have been delivered by residents to one of the City of Madison drop-off sites. Rigid plastic items are typically children's toys and buckets. The rigid plastic was placed into a dumpster owned by Pellitteri Waste Systems, who would also haul the dumpster for dumping.

The rigid plastic program was suspended in 2017 due to an import ban by China on plastic scrap. The long-term future of this program is hazy because a new marketplace is needed for the rigid plastic material. If another outlet for this material is discovered—either foreign or domestic—the program will be re-started.

Tires

This is the tonnage of tires collected curbside or taken by residents to a Streets Division drop-off site. Tires are aggregated at the Streets Division's transfer station facility and then loaded onto a semi-trailer to be delivered by a Streets Division employee to a tire recycler.

Computers/Electronics

This is the tonnage of electronics, including televisions, computers, and other electronic items—like box fans, Christmas tree lights, stereo equipment, and so on—that have been delivered by residents to the drop-off site for recycling. The city's recycling vendor for electronics is Universal Recycling Technologies.

Move-Out ReUse

This is an estimated total based on a report from the UW-Madison staff at their Donate and Take collection site stationed on campus property during the student move process in early August each year.

The University elected not to host a Donate and Take site in 2017. What the University's plans are for a future Donate and Take site, or other diversion services spearheaded by the University for the student move process, is unclear as of this writing.

Styrofoam

This is the tonnage of Styrofoam residents of Madison delivered to the drop-off sites for recycling. The Styrofoam is aggregated in a semi-trailer at the transfer station location and hauled to Uniek in Waunakee, WI to be processed into picture frames.

Vehicle Batteries

This is the tonnage of vehicle batteries recycled by the City of Madison. This includes vehicle, and other lead acid batteries, delivered to the drop-off sites by residents. The tonnage also includes vehicle batteries recycled by Fleet Service and Metro Transit through their own vendors.

Household Batteries

This is the reported tonnage related to household batteries delivered by residents to the City of Madison drop-off sites for recycling. The batteries are collected from the drop-off site by Universal Recycling Technologies.

Shoes/Textiles

This is the weight of material placed into the clothing recycling bins at the City of Madison drop-off sites. The weights are reported by St. Vincent de Paul and Goodwill.

Construction & Demolition

This is the weight of material collected and recycled by area demolition recyclers.

Organics Program

This is the weight of material collected by the City of Madison's pilot food waste collection and diversion program.

Monona Terrace Composting

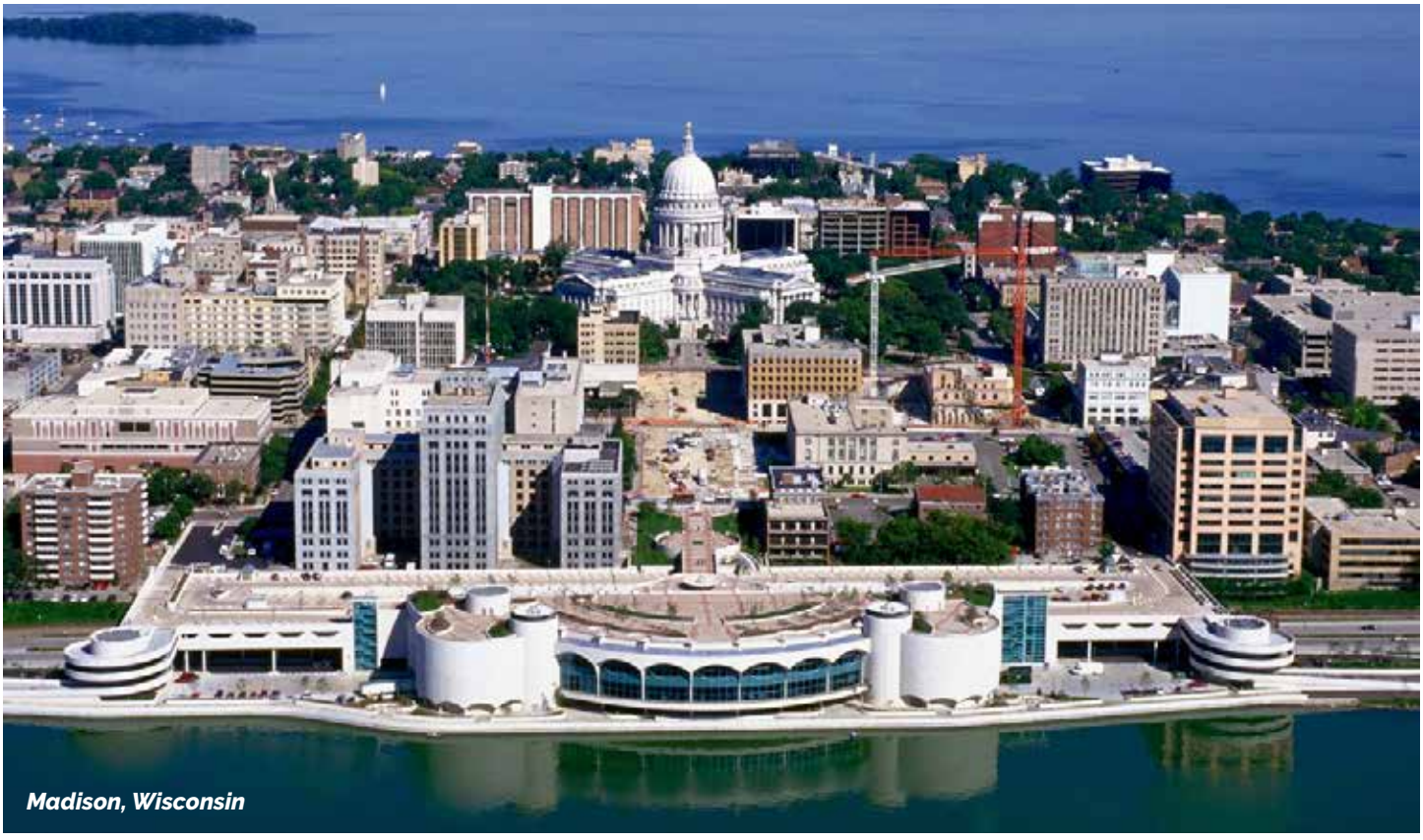
This is the weight of material reported by Monona Terrace regarding their composting efforts for food waste.

Parks/Mall Recycling

This is the weight of recycling collected by the Parks Division from the State Street mall area and from their collection bins located throughout city parks.

Mattresses & Box Springs

This is the weight of the mattresses and box springs collected and recycled by the Streets Division. Collection occurred either at the curb during the large item collection day of the assigned area or delivered by a resident to a drop-off site.



Madison, Wisconsin

Section 5 – Current Services

Please note that this section captures only the solid waste portion of the Streets Division duties. This does not cover snow plowing, street repair, graffiti removal, or other services provided by the agency.

Residential and Commercial Overview

The Streets Division provides automated curbside collection of refuse and recycling for single-family homes, multi-family buildings containing fewer than eight units, and some commercial entities. Refuse is collected weekly. Recycling is collected every-other-week. As of this writing, the Streets Division services approximately 77,000 homes and between 500 to 600 small businesses.

Some neighborhoods use carriage lanes that cannot support our collection vehicles, and those neighborhoods instead must employ a private contractor, which is generally obtained through homeowner associations. Apartment buildings larger than eight units also must rely on private service for their collection of refuse and recycling. Certain businesses, like fast food restaurants, and other multi-family buildings may need to use private services if the Streets Division's collection system does not meet their needs due to volume of material generated or available space. For example, a cluster of six-unit apartment buildings on a cul-de-sac may not be able to use City collections because there is not enough space along the curb for collection carts, and they must instead use a private dumpster service.

Collection Carts

Residents of Madison are guaranteed one tan refuse container and one green recycling container at no cost. Residents are automatically enrolled in the City program for refuse and recycling.

Containers provided by the Streets Division are available in 65-gallon or 95-gallon sizes. Residents can exchange their cart sizes for no fee.

Residents can also purchase additional carts if necessary. In 2017, the rates are $60 to purchase a 65-gallon cart, and $65 to purchase a 95-gallon cart.

If a resident, or business, requires more than four refuse collection carts, an additional fee is assessed to that home or business. In 2017, the fee is an annual $80 charge for every cart more than four. There is no cart limitation or excess fee for recycling.

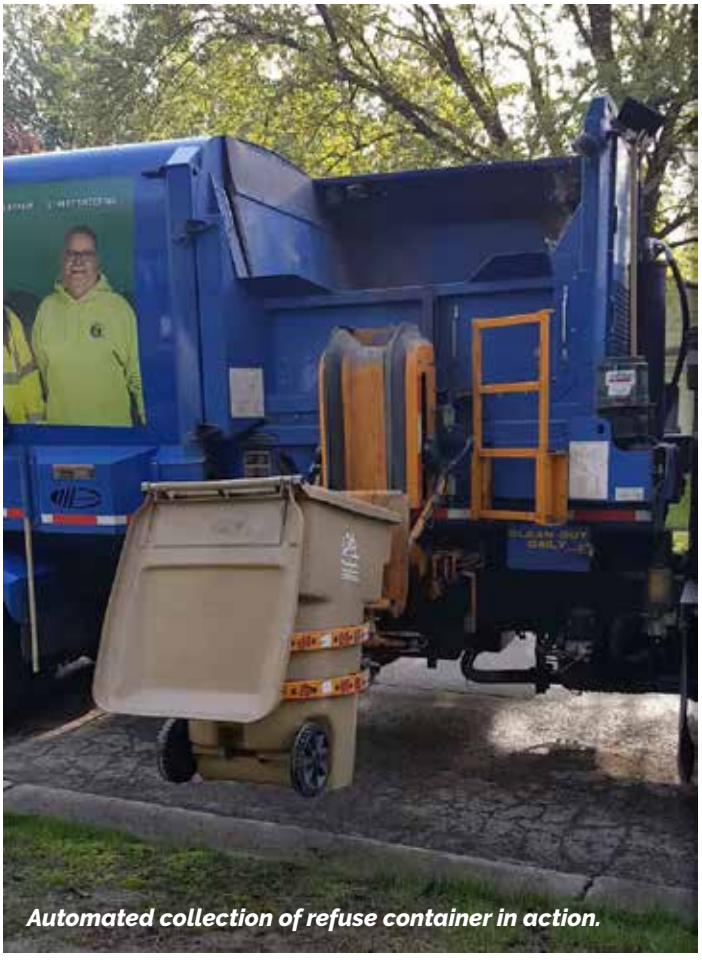
Example of 95-gallon recycling cart.

Curbside Refuse Collection

Refuse collection occurs weekly by a single-operator automated refuse collection truck. The City of Madison has been performing collection in this manner since 2007.

"Automated" collection does not mean "autonomous." A vehicle operator drives the collection truck on a pre-determined route designed by field supervisors. When at a refuse collection stop, the operator manipulates a joystick to position a mechanical arm to grab a collection cart from the curb and then triggers the arm to dump the contents of the cart into the vehicle.

This method of collection keeps the operator in the vehicle, and does not require the operator to lift, tip, or dump heavy collection carts. This has been a boon to productivity and injury prevention.



Automated collection of refuse container in action.

On occasion, an operator will need to exit the vehicle if there is refuse material bagged and placed outside of the collection truck. In order to minimize the amount of time outside of the collection trucks, and limiting operator exposure to potential injury, it is Streets Division policy to only collect bagged material outside of the cart if there are six or more bags present to help facilitate instances of high volume refuse generation, like a household cleanup or move out. If a residence is noted to have bags outside the cart for multiple collection weeks in row, the residents will be directed by field supervisors to obtain additional carts to meet their refuse collection needs.

The same style of collection truck is deployed for curbside recycling services as well.

Curbside Recycling Collection

Recycling collection occurs every other week with a single-operator automated collection truck. The collection is "single stream" meaning the residents do not need to separate the recyclables into different containers, and instead can commingle all the material acceptable in the program into a single collection cart. The City of Madison has been performing collection in this manner since 2005.

Recycling began in Madison in 1968 by collecting bundled newspaper at the curb, making Madison one of the first communities to offer that service to residents. Newspaper recycling expanded citywide in 1970, and by 1986 became mandatory. In 1987, the City began a drop-off recycling program for households. Curbside collection of aluminum, corrugated cardboard, glass, steel cans, and #1 (PETE) and #2 (HDPE) plastics began later. By 1994, magazines and catalogs were added to the program, and around this time, residents were asked to bag all the containers intended for recycling and separately bind all the cardboard and paper products. This material was

then collected manually and placed into two separate compartments of the manual collection trucks.

The collection system remained unchanged until adoption of the single-stream automated collection in 2005. This allowed an expansion of recyclable material as well to include mixed paper, office paper, paper cartons, and plastic bottles of #3 through #7 plastic. In 2012, the program expanded yet again to include dairy tubs and other plastics number #1 through #7, empty paint cans, metal pots and pans, small metal appliances, miscellaneous scrap metal pieces and properly packaged shredded paper and plastic bags.

Today, the material accepted into the program is quite extensive. See the chart on the next page that shows all the paper, plastic, metal, and glass items presently acceptable in the cart.

Example of the circa 1994 collection style performed by Streets Division employee John Zumstein.

Clean Paper Products

What Can Be RECYCLED in the green cart?

- Cardboard cores from paper towels, bathroom tissue, etc.
- Cardboard-sided cans
- Cereal and cracker boxes
- Corrugated cardboard
- Envelopes
- Gift wrap (no tissue or foil paper)
- Greeting cards
- Juice boxes, TetraPaks, and other aseptic/gable top cartons
- Junk mail
- Magazines and catalogs
- Newspapers and all the inserts
- Office and computer paper
- Outer frozen food boxes
- Paper egg cartons
- Paper grocery bags
- Paper milk and juice cartons (even if they have a plastic spout)
- Paper/cardboard backing off retail packages
- Phone books
- Receipts and bills
- Soda cases etc.

- **Shredded paper** must be in a clear or white bag. Bag of **shredded paper** should be no larger than a basketball.

Clean Glass Products

What Can Be RECYCLED in the green cart?

- Bottles - remove the lids (metal bottlecaps should be recycled as noted below in Metal Products)
- Jars - remove the lids (metal lids can be recycled loose in cart if they are roughly the size of a dairy tub lid, same with most plastic lids)

Clean Plastic Products

What Can Be RECYCLED in the green cart?

- All plastic clamshell containers
- All plastic containers #1 thru #7
- Berry & deli containers
- Blister packs (the difficult to open packaging for electronics, toys, etc.)
- Bottles (soda, water, etc.) - leave on lids
- Condiment bottles/jars (catsup/ketchup, mustard, etc.) - leave on lids
- Cups if they are #1, #2, or #5
- Dairy tub lids
- Dairy tubs (cottage cheese, etc.) - lids do not need to be on
- Frozen juice containers
- Jugs (milk, juice, etc.) - leave on lids
- Laundry bottles - leave on lids

- Most **plastic bags** - must be bundled into another **plastic bag** and the resulting bag-of-bags should be approximately the size of a basketball before placing it into the cart.

Clean Metal Products

What Can Be RECYCLED in the green cart?

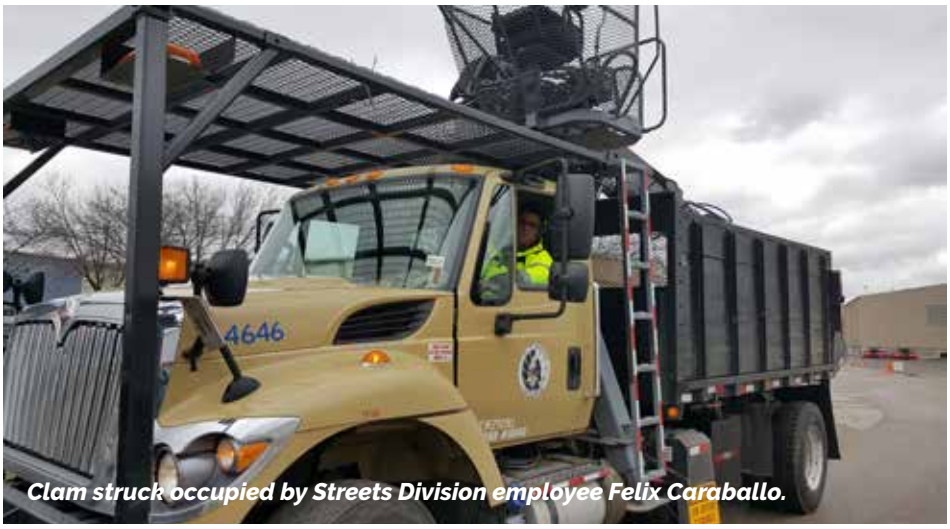
- Aluminum cans
- Empty aerosol cans
- Empty paint cans & lids
- Metal lids from glass jars & bottles
- Metal pipe 18" in length and less
- Metal plumbing fixtures
- Other metal items weighing less than 10 pounds
- Pots & pans
- Small metal appliances, such as toasters, mixers, etc. (remove glass)
- Small metal items like bottle caps, bolts, spare keys, etc. can be placed into an empty tin can and the top of it tightly pinched closed
- Steel/tin cans

Currently accepted recyclable items in recycling cart.

Large Item Collection

Large items are generically considered to be items too large for a collection cart, such as a mattress or piece of furniture. Curbside collection occurs every other week.

Large items are collected by a single-operator truck-mounted crane vehicle, colloquially referred to as a "clam truck" (see photo). The crane can load material into the truck bed part of the vehicle, or into an open-top five-ton truck. A separate five-ton truck is also used to collect metal items from the curb that the City takes to a contracted metal salvager for recycling.



Clam struck occupied by Streets Division employee Felix Caraballo.

The large metal items are presently processed by Kruser Recycling. Kruser safely handles the hazardous material that can exist within appliances collected at the curb, such as CFCs, PCBs, and mercury switches.

Due to these hazards, and associated disposal costs, some large items require an appliance fee sticker be purchased and affixed to the item prior to collection, or delivery to a drop-off location. The fee changes based on the item. Tires off the rim, for example, require a $5 sticker, while dishwashers require a $35 sticker. The amount of the sticker is determined by the cost to safely dispose of the item, or to account for the stress the item places on the collection system. For example, hot tubs require a $35 sticker not because they contain hazardous material, but because one hot tub will fill a collection vehicle and require an additional trip to the transfer station.

Clam truck collecting couch during 2017 student move.

Since 2005, the Streets Division has been grinding wood, primarily wood furniture and lumber, collected as large items. The shredded wood is then re-purposed at the Dane County Landfill campus as road base to allow vehicles to safely climb and dump on the actual landfill itself.

Drop-Off Sites

At present, the Streets Division operates two year-round drop-off locations and one seasonal yard waste only drop-off location. The year-round sites are located at 1501 W. Badger Rd., which is also the location of the west side Streets Division operations office and department-wide administrative offices, and 4602 Sycamore Ave., which also houses the east side Streets Division operations. The seasonal yard waste only site is located at 402 South Point Rd. and is open from the last weekend in March to the first weekend in December. The seasonal site is also the location of a warm storage building for Streets Division equipment.

Drop-off site hours fluctuate depending on the season. During the expanded "summer hours," which lasts from the last weekend in March to the first weekend in December, the drop-off sites are open 8:30am to 4:30pm on Mondays, Wednesdays, Fridays, Saturdays, and Sundays. On Tuesdays and Thursdays during expanded hours, the sites are open 8:30am until 8:00pm.

During the limited "winter hours," which lasts from the first Monday in December to the last Friday in March, only the Sycamore and Badger drop-off sites are available, and they are open from 7:30am until 3:00pm, Monday to Friday.

At the Badger and Sycamore drop-off sites, City of Madison residents can bring refuse, recycling, large items, brush, and yard waste for recycling or disposal.

The drop-off sites also offer recycling services for electronics, household batteries, cooking oil, and Styrofoam. These materials are only accepted for recycling at the drop-off site. The rigid plastic recycling program, when in effect, was also housed at the drop-off sites.

Only residents and taxpayers of the City of Madison can use the drop-off sites. Residents must also restrict the size of the load of material they bring in to what will fit into the back of a standard pick-up or small trailer. Non-residents, over-sized loads, and contractors are denied use of the drop-off sites.

The drop-off sites are a critical component of the Streets Division's solid waste services, and they are highly used City facilities. According to a 2017 traffic volume study performed during the expanded hours period, all three drop-off sites combined receive approximately 1,000 visits a day on average.

Badger Rd. drop-off site during winter hours of 2016.

Curbside Brush Collection

The Streets Division provides curbside brush collection on a rotating schedule. While there is no pre-determined date for brush collection to occur at a resident's home, like the prescribed dates for refuse and recycling collection, residents on average receive brush collection once every four to six weeks.

Brush is defined as woody material trimmed from trees and bushes measuring over 18 inches in length. Brush must be less than 8 feet long, and be less than 8 inches in diameter.

Brush is collected by crews operating a five-ton truck pulling a tow-behind wood chipper. Residents pile brush to the curb, and the two-man crew pushes the brush into a wood chipper. There is no set maximum on the amount of brush residents can set to the curb.

Piles that will take the two-man crew more than 10 to 15 minutes to collect are instead assigned to a clam truck. The clam truck is the same style of vehicle used to collect large items.

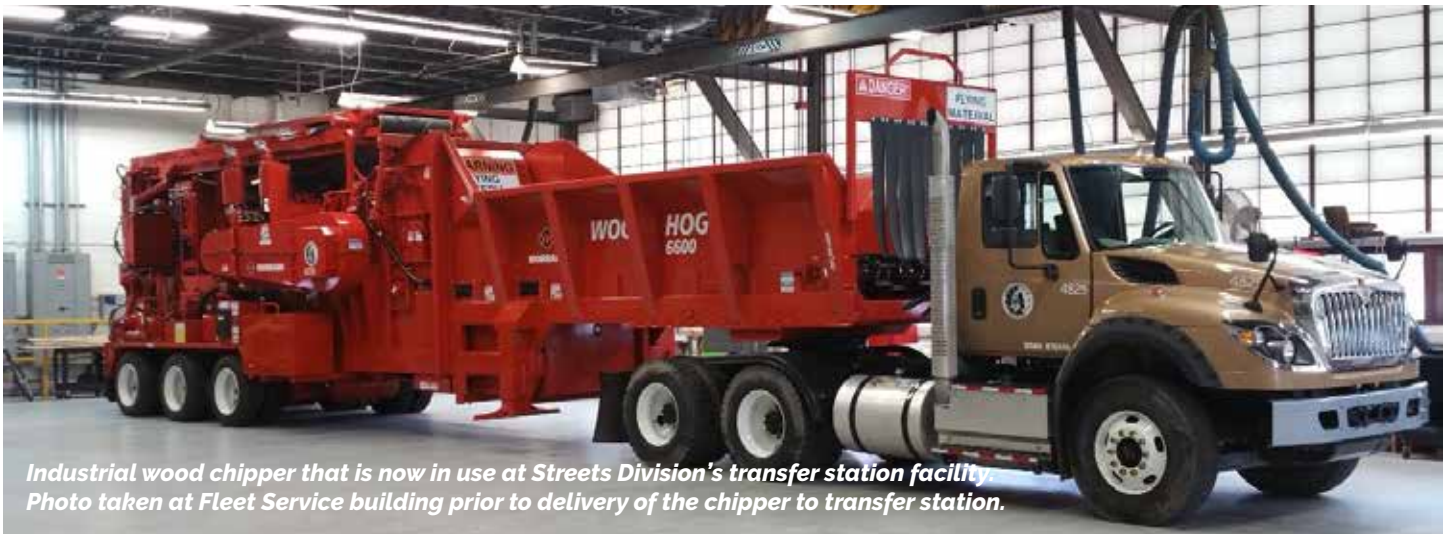
This service is only available to residents who have cut their own brush. Residents who employ private contractors must make arrangements with the contractor to haul the material off site for proper disposal.

The collection season begins in the spring after the winter thaw and continues throughout the year until stopping in the fall when additional personnel is needed for leaf collection. The season starts with crews collecting brush from areas of Madison with a Monday refuse collection day. Crews pick brush from each street within that district one time. Crews will continue working for as many days as necessary until all of the streets within the Monday collection district have received one collection. After each street has received the collection, crews rotate into the area of the city with a Tuesday collection day. After the Tuesday district has been completed, collection crews move into the Wednesday, then Thursday, and then Friday collection districts. Upon completion of the Friday district, crews begin another cycle through the city and start over in the Monday collection district. Crews complete as many cycles through the city as possible during the collection period.

After the brush is collected by either the wood chipper or clam crews, it is hauled to the City's transfer station facility at 121 E. Olin Ave. for further processing.

Curbside brush collection in progress.

The Streets Division takes the brush and wood chips and sends them through a large industrial wood shredder to create mulch. The shredding process creates pieces of wood too small for the emerald ash borer to survive, so there is no risk of spreading that invasive species.



Industrial wood chipper that is now in use at Streets Division's transfer station facility. Photo taken at Fleet Service building prior to delivery of the chipper to transfer station.

Wood chipper working.

The created mulch is available to the public for a small fee depending on the amount of material needed. Semi-truck loads of mulch are popular with area farmers and landscapers to use for their businesses, whether to be used as mulch, animal bedding, or compost.

Pile of wood chips at transfer station after processing through chipper.

Curbside Yard Waste Collection

The Streets Division performs curbside yard waste collection during two separate periods: first in the early spring after the winter thaw and again in the autumn when the leaves fall. There is no summer curbside collection of yard waste material. Two separate collection periods has been the Streets Division's practice since 1980.

Yard waste is considered plant material such as grass clippings, weeds, leaves, and other plant/ garden debris. Also, twigs that are too small to be considered brush are collected as yard waste.

Yard waste collection is a multi-vehicle, multi-person operation.

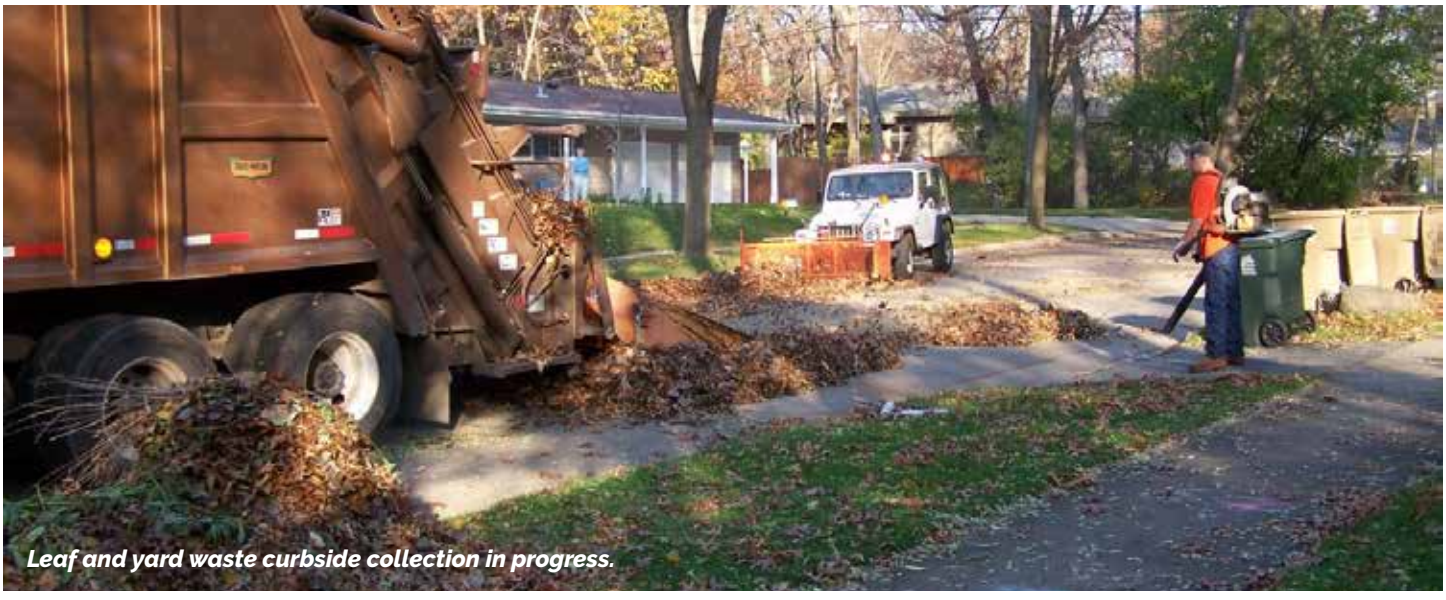
Collection involves one small truck, jeep, or tractor equipped with a custom built U-shaped push broom fashioned from used street sweeper brushes and mounted to the front of the tractor or truck. The vehicle drives onto the terrace and pushes or drags the leaves into the street. Along with the tractor is a rear-loading refuse truck that is equipped with a large metal pan on its rear side. The tractor pushes the yard waste from the terrace onto the pan, and then the pan is lifted and dumped into the back of the rear-loading vehicle.

Along with the rear-loader and tractor, there are one to two more employees that use commercial leaf blowers or rakes to help collect more leaves from the terrace and curb line.

After leaves have been collected from a street, a street sweeper will service the street within 72 hours after leaf collection in order to remove the leaf litter left behind in the street from the pushing operation.

This has been the method of leaf collection for several years, and it works well with the volume of yard waste material produced by Madison, which can range from 15,000 to 18,000 tons. The bulk of that tonnage comes in the six weeks between when the leaves begin to fall and the start of the winter snows.

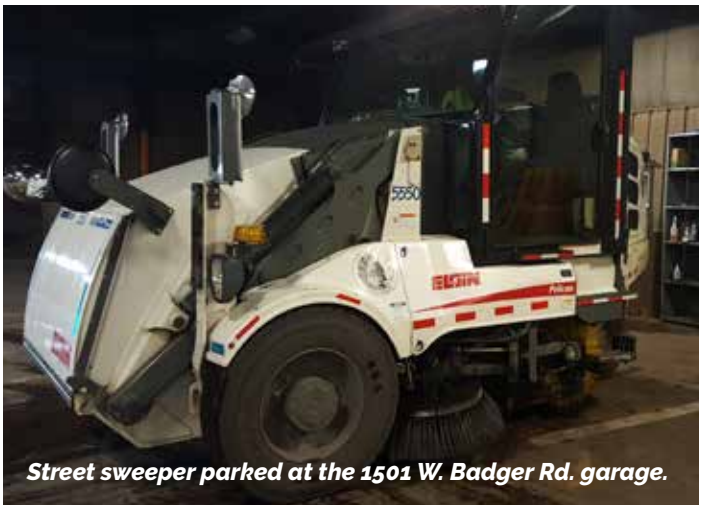
As of this writing, the leaves are hauled to Purple Cow Organics where they are processed into compost. Dane County halted their program to accept leaves and yard waste at their compost facilities in 2014, which resulted in the City contracting with a private composter. Purple Cow Organics has been the contractor for the City's leaves since 2017. Prior to Purple Cow Organics, the City used Circle B Inc. in DeForest, WI as the composter.



Leaf and yard waste curbside collection in progress.

Street Sweeping

The Streets Division operates nine sweeper vehicles to perform regular street sweeping operations in an effort to control roadside contaminants from entering the waterways. The Streets Division also has one small sweeper that can maintain the off-street shared-use paths that are predominantly used by area bicyclists. Funding for the sweeping program is provided by the Storm Water Utility managed by the Engineering Division.



Street sweeper parked at the 1501 W. Badger Rd. garage.

On average, most residential streets in Madison are swept on a monthly basis. Sweeper crews follow a similar rotation as the brush and yard waste collection crews.

Some areas of Madison are considered "special sweep" locations and require weekly street sweeping. These areas are in the downtown/ isthmus area of Madison and contain storm drains that empty directly into the lakes.

Waste Motor Oil Recycling

Madison started a motor oil recycling program in 1978 to help prevent individuals from dumping oil into storm drains that empty into area lakes and streams. At present, the program is managed by the Engineering Division, and there are four current drop-off sites that are maintained by the Engineering Division. A fifth site was closed permanently in 2015 when it became contaminated with PCBs when someone dumped that chemical into the collection container. As a result of the contamination, the sites are now tested weekly. Many private motor oil change facilities and garages also accept motor oil, many of which will charge a fee.

Related Dane County Programs

Besides operating the Dane County Landfill, the county is home to two key services available to City of Madison residents that are located on the landfill campus.

First is the operation of Dane County Clean Sweep. This facility accepts hazardous household material, such as paint, stains, insecticide, and other dangerous and ignitable chemicals. This service is available for all Dane County residents at a small per household fee.

Second is the construction and demolition recycling facility installed on the landfill campus in 2016. In cooperation with a private company, the landfill can now divert and recycle construction material that is dumped at this facility. While it is predominantly used by large contractors, it is also available for residents doing their own construction work.

Waste Prevention

Waste prevention is an important practice that is a more reliable method to achieve zero waste goals, especially since recycling is reliant upon a global marketplace to process the commodities. The Streets Division has tried previous waste prevention efforts, namely the EnAct program. While EnAct did not produce results, the Waste Watchers section of the Streets Division's website has helped educate the public on some simple waste prevention techniques.

Section 6 – The Goals

GOAL A

ESTABLISH SOUTH POINT AS A FULL-SERVICE DROP-OFF FACILITY AND STREETS DIVISION OPERATIONS SITE

Objectives	Timeline
» Design a full-service site that includes adequate equipment storage and well-considered drop-off services with easy customer access	2019
» Re-map services provided by the Streets Division so that services can be split among three locations, and update staffing plans accordingly	2019
» Build South Point facilities	2020, budget dependent
» Open fully staffed and operational South Point facility to the public	2021, budget dependent

Background and Additional Information

A full-service Streets Division facility at South Point Rd. has been an idea gestating for decades. As the City continues to sprawl westward, it's becoming increasingly clear that in order to ensure equitable access to services provided by the Streets Division the South Point Rd. facility is a necessity.

As of the writing of this plan, the entire west side of Madison is serviced by the Streets Division office located at 1501 W. Badger Rd. This facility also acts as the sole public drop-off site for the west side of Madison.

Streets Division drop-off sites provide access for residents to recycle items that cannot go into their recycling carts. As of this writing, these items include electronics, household batteries, Styrofoam, and cooking oil.

The drop-off sites present the most likely opportunity for recycling services expansion. For example, if carpet recycling were to be attempted, providing it as a drop-off service would likely help keep the carpets from getting wet, which would render them non-recyclable.

With only 1501 W. Badger Rd. as a west side location for Streets Division services, residents within the newer western developments are left with an approximately 20-mile roundtrip drive to recycle electronics, batteries, Styrofoam, cooking oil, and rigid plastics. This distance is considerable and is a disincentive for these residents to recycle these items, as well as a barrier to their participation in future expansions of recycling services stationed at the drop-off sites.

A conveniently located full service drop-off site would likely result in increased diversion of recyclable material that residents in this outlying region felt necessary to place into the refuse.

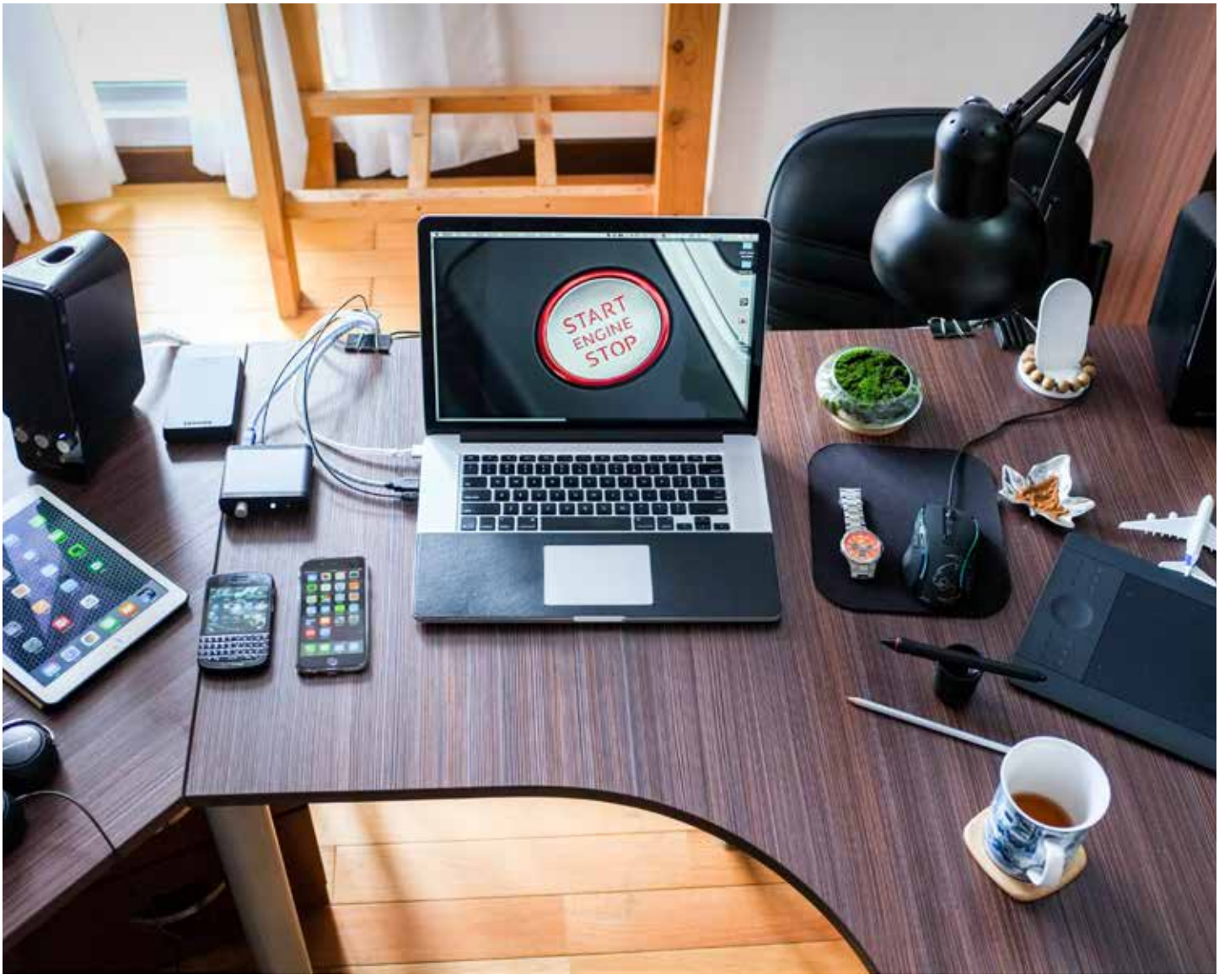
Access to a convenient place to recycle electronics is very important, especially considering the increase of electronic and battery-powered items in the home. Many common household electronics items, such as printers, VCRs, and cell phones are banned from the landfill, which means residents should not place them into the tan refuse cart. These items also

GOAL A *CONTINUED*

cannot be recycled in the green recycling cart. This leaves few, if any, convenient options for mandatory electronics recycling.

A third Streets Division location would also speed brush and leaf collection as crews would be able to focus on smaller sections of Madison, providing an increased level of service. This would be especially useful for leaf collection in the fall, as leaves in the streets are a major contributor to elevated phosphorus levels in our lakes. By providing more frequent collection and street sweeping during the fall and spring periods, leaves would not remain in the street for as long, which should reduce the phosphorus load created by that material.

The third location also provides an opportunity to reassess and strategically locate Streets Division assets to serve Madison in a faster and more efficient manner.



GOAL B

ESTABLISH CITYWIDE ORGANICS COLLECTION PROGRAM

Objectives	Timeline
» Establish organics/food scraps collection program citywide and operator organics/food scrap drop-off services	To be established prior to 2028 to align with Comprehensive Plan goals regarding organics

Background and Additional Information

Diverting food waste from the landfill will be a key component to increasing diversion from the landfill. According to a 2010 waste sort, nearly 40% of the Madison's refuse is organic material. Food waste by itself comprises 25% of the overall refuse delivered to the landfill according to the same study.

Using the recorded 2016 refuse weight tonnage collected by the City of Madison (44,866.15 tons), the City could prevent an estimated 17,946.46 tons of material from going into the landfill if all organics material, such as soiled paper products, diapers, and pet waste, were diverted. If only food waste is kept from the landfill, an estimated 11,216.54 tons would be diverted.

Also using the 2016 refuse weights, if City operations were able to divert solely the food waste, it would raise the overall diversion percentage from 58.4% to an estimated 64.3%. Being able to include the diapers and pet waste would raise the overall diversion percent to an estimated 67.9%.

Since pet waste and diapers present considerable logistic and regulatory hurdles at present, it would not be wise to assume this material could be diverted in the near future. However, soiled paper products, such as used paper towels and greasy pizza boxes, would be readily acceptable in food waste diversion systems, such as composting or an anaerobic digester. Therefore, the expected tonnage for a citywide program would be somewhere between the high and low estimated diversion percentages mentioned previously. For a more accurate estimate of the city's waste that would combine just used paper products appropriate for digestion and food scraps, a new waste sort would need to be performed.

The City of Madison collects food waste and soiled paper products from participating households and businesses that are within prescribed areas of Madison. The collections areas were selected by Streets Division operations staff to maximize the number of participants and ease of collection routes for our automated collection.

To expand collection beyond its current capacity, there will need to be two major developments.

First, there will need to be an increase in collection capacity through additional operators and collection vehicles. Second, there will need to be a reliable and cost effective location to perform composting and/or anaerobic digestion of the organics collected by the Streets Division while also providing adequate contamination control. Despite previous plans, it is unlikely that the City would be able to make the investment in the timeline noted above to own and operate an anaerobic digestion facility on its own.

GOAL B *CONTINUED*

The obstacles likely preventing the City from owning and operating its own digester may not cause any significant delay to the eventual expansion of this program. As of this writing, many entities, both private and public, have discussed the possibility of undertaking organics diversion—including potential anaerobic digestion facilities. An organics/food scrap recycling program may be established and meet the needs of Madison without the City alone investing in the processing facility—though the need for the City to invest in equipment and personnel would remain. But, considering the importance of this element of waste diversion to broader sustainability goals, the City should not completely discount the potential need to invest in either composting food waste or anaerobic digestion.

Part of this goal will be for the Streets Division to foster relationships with private food waste entities to ensure organics diversion continues and expands along the timeline stated above. Any agreement made with these entities must also meet the values of the Streets Division and the City of Madison, not come with any unacceptable environmental trade-offs, and prove to be a practical and convenient service for the residents of Madison.

It must also be acknowledged that any expansion of the organics program must come with the means to control for contamination problems. Non-compostable items finding their way into the food scraps stream has been a problem since organics diversion was first piloted in Madison. Non-compostable items, such as plastics, metals, and glass, hurt the likelihood that the food scraps can be turned into a usable compost, because if the scraps contain metal, glass, or plastic, the compost will be difficult for a processor to sell or otherwise use—meaning thousands of tons of material that were intended to be diverted from the landfill may wind up there anyway because there is nowhere else the material can go.

Other communities that have pursued food waste diversion have invested in depackaging or other sorting technologies to try to control for contamination. Expansion of this program, especially on the citywide scale, will need to have sufficient contamination controls to be successful.

GOAL C

IMPROVE COMMUNICATION FROM THE STREETS DIVISION REGARDING RECYCLING AND OTHER SERVICES PROVIDED

Objectives	Timeline
» Establish a social media presence for the Streets Division to take advantage of free media opportunities	2018
» Better utilize current web-based resources to better share recycling information and diversion opportunities	Continuous
» Create a formal strategic communications plan, or message calendar, and outreach targets for the Streets Division to be sure department objectives and services are understood and shared	2019 Implementation

Background and Additional Information

Clear, consistent, and engaging communication is an essential part of any successful program. The Streets Division would especially benefit from quality communication because our services are varied and impact every resident within the City of Madison.

Increasing diversion as noted above will require residents of Madison to change their behavior, which will be a great challenge. The media landscape is fractured, making it increasingly difficult to reach and persuade our residents to change their habits to reach sustainability goals. Creating messages and sharing information in a variety of ways that embrace both digital and traditional media is important to continue meeting Streets Division goals.

Since communications from the Streets Division is a key way for residents to gain knowledge of Streets Division and City of Madison goals, it is important to have a plan with clear objectives in place.

Any communication plan would also need to include outreach considerations for the growing diversity of the City of Madison, and be certain that communications reach and impacts those audiences.

The cost of a widespread communications program must also be considered. Advertising on traditional and digital media can prove to be expensive. The Streets Division must leverage all no-cost and low-cost resources, such as social media, and utilize the City's media team to help spread departmental and sustainability goals and programs.

GOAL

STRENGTHEN CONSTRUCTION AND DEMOLITION RECYCLING PRACTICES

Objectives	Timeline
» Improve data collection within the City of Madison regarding construction and demolition debris	2018
» Strengthen City ordinances regarding construction and demolition recycling reporting, if necessary	2019
» Strengthen City ordinances regarding remodeling recycling reporting for projects costing over $20,000, if necessary	2020

Background and Additional Information

Waste is measured by weight, and weight is what diversion statistics are based on. By far, the heaviest material entering Madison's waste stream relates to construction and demolition projects. Better management of these materials, and better tracking of these materials, would result in improved diversion statistics.

As of this writing, the recovered weight of this material is acquired from processors/recyclers of construction material in the area. While these weights accurately depict what they are processing, it does not necessarily accurately depict what projects within the City of Madison are doing since these processors also work with projects outside of Madison.

In Madison General Ordinance 10.185, there is a requirement that demolition and construction projects divert 70% of their waste from landfills, and remodeling projects that cost more than $20,000 are also required to recycle. The same ordinance also requires reporting the recycling total within 60 days of the completion of the project.

Since a gap exists between the ordinance and the data collection methods of this material, improvements should be made to be sure that projects within the city are meeting the values and expectations of Madison.

If efforts to improve data collection within current ordinances do not produce results in capturing this information, the next logical step would be to strengthen the ordinances surrounding construction and demolition recycling.

Any changes to the ordinance, however, must be carefully considered to be sure that they are both practical and not a hindrance to development within the City of Madison. Nor would any changes to the ordinance be done to be punitive, but rather solely to increase recycling practices and reporting of the construction sector of Madison.

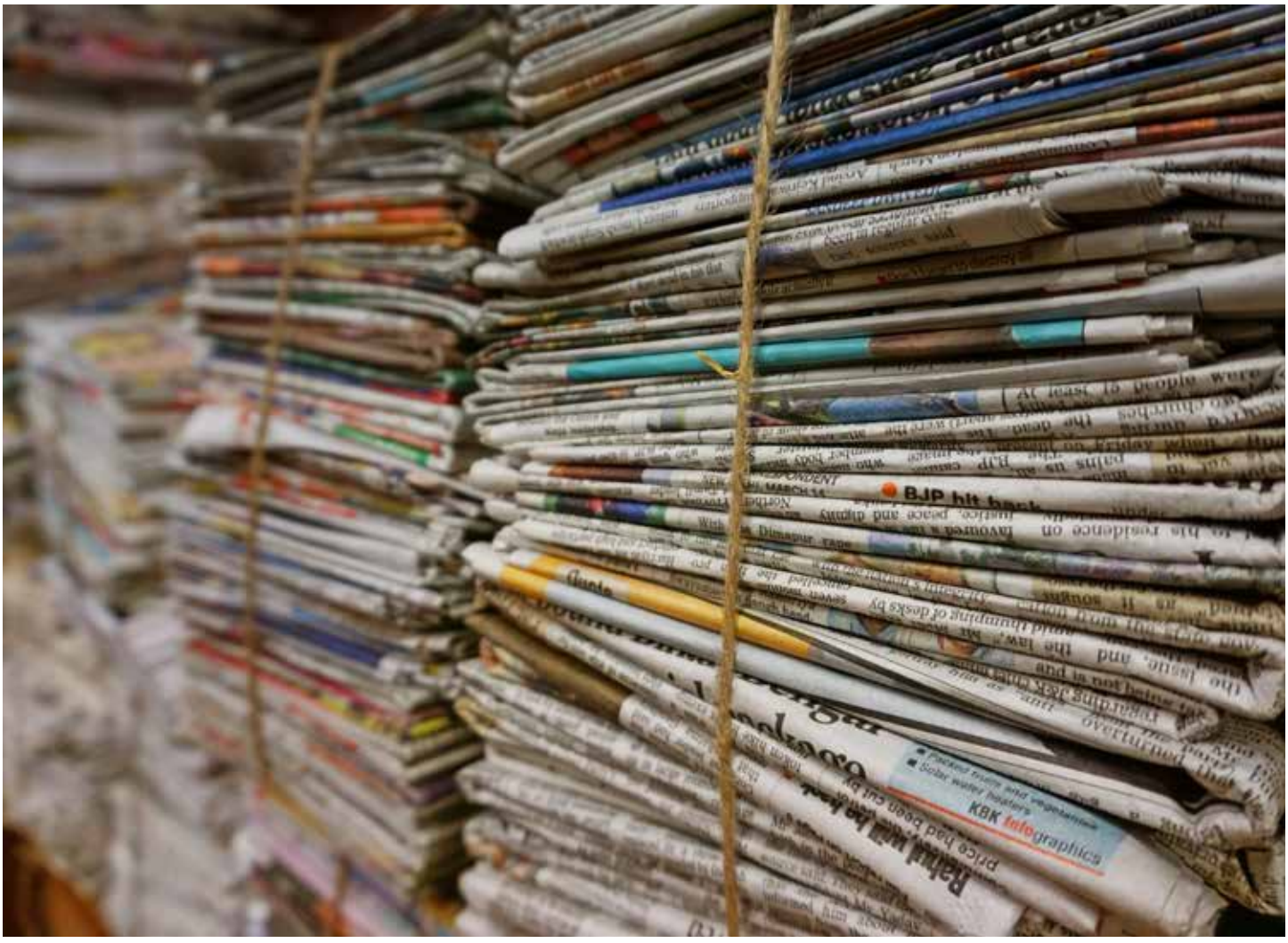
GOAL

CONTINUE SUPPORTING SUCCESSFUL PROGRAMS THAT INCREASE DIVERSION, EQUITY, AND RECYCLING

	Timeline
This includes programs such as the Neighborhood Resource Teams, sharps collection underwriting, the roll-out assist program, etc.	Continuous

Background and Additional Information

The Streets Division provides excellent service to all City of Madison residents. This goal is intended to underline the commitment to continue providing services to everyone, and finding ways to assist traditionally underserved and vulnerable communities in keeping their homes and communities safe and environmentally responsible.



GOAL F

CONTINUE TO SEARCH FOR OPPORTUNITIES FOR OTHER RECYCLING AND DIVERSION OPPORTUNITIES WHERE PRACTICAL AND AFFORDABLE

Timeline

Continuous

Background and Additional Information

Waste streams are always changing, especially as packaging material changes and global markets and consumer habits evolve. These natural fluctuations will create both challenges and opportunities for recycling, and it is important to be sure that the opportunities that are available can be leveraged and the challenges minimized or overcome.

Pursuing new opportunities for recycling material will be an important role for the recycling coordinator, especially as diversion expectations tick upward over time. And the pursuit will not end so long as waste is a result of our consumption-based economy.

The recycling coordinator and the Streets Division must stay committed and attuned to what advancements and opportunities exist, and how best to bring them to Madison in a manner that is cost effective and practical to end users.

This also serves as a catchall goal to improve diversion practices when new opportunities are revealed.

GOAL G

PURSUE INCREASED PUBLIC PLACE RECYCLING EFFORTS

Objectives	Timeline
» Pilot recycling litter containers in select areas, and monitor these cans for contamination	2018
» Expand recycling opportunities in parks and other community spaces	2019
» Pilot food waste diversion for neighborhood festivals and events	2020
» Pilot food waste collection points at neighborhood farmer's markets located within the City of Madison	2021
» Require that a food waste diversion and waste reduction plan be a part of any street use permit for events	2022

Background and Additional Information

Public place recycling is a significant challenge due to the likelihood of contamination. Yet it also is a public statement regarding a community's commitment to recycling. Therefore, it is worth the effort to make recycling visible while taking all appropriate measures to guard against contaminating otherwise valuable recyclables.

Currently, Madison's only recycling litter containers are located within the Business Improvement District (BID) along State Street. This particular area is unique in that it receives daily collection from the Parks Division as part of the maintenance of this highly utilized and visible corridor of Madison.

The daily collection and monitoring of the State Street recycling containers cannot be replicated at litter containers collected by the Streets Division. Streets Division's daily operations are not localized the same way as the daily operations of the Parks Division employees within the BID, and to service a group of cans daily would be very inefficient. Careful consideration of container placement will be necessary for early success. Carts would be placed in high foot traffic areas that are likely to also generate recyclable waste based on the businesses in the area, and the carts would need to have enough capacity to only require at most a weekly collection. Litter containers would also need to be located in a manner that fits the recycling system.

The carts would need to be carefully monitored and the waste diversion achieved by these recycling litter containers must also be considered before the program can be expanded. For example, if there is only minimal correct use of the recycling litter containers, then rather than investing funds into purchasing additional carts, perhaps those funds could be better spent elsewhere.

Other expansions of public place recycling services include recycling options within City parks and other public places. Recycling within parks is a service provided by the Parks Division, so any expansion of these services would need to be done in conjunction with that agency and also done with the same strategic, watchful rollout as other recycling litter containers.

Also, expanding recycling commitments to include food waste are incumbent upon the development of the infrastructure noted in Goal B.

GOAL

PERFORM REGULAR WASTE SORTS OF MATERIAL IN REFUSE AND RECYCLING CARTS

Objective	Timeline
» Set a regular interval to assess material contained within refuse and recycling	2019, repeating as necessary at regular intervals

Background and Additional Information

As of this writing, the last waste sort analysis performed by the City of Madison occurred in 2010. Information gleaned from that report revealed the need for food waste diversion practices and provides the basis for the continued pursuit of the food waste goal.

As the waste stream changes, and as the diversion expectations climb, it makes sense to regularly re-evaluate what materials residents are placing into their refuse and recycling carts.

Using the 2016 diversion numbers, and even assuming the implementation of a successful food scraps diversion program, about 26,000 to 33,000 tons worth of materials would still be destined for the landfill. The percentage of that material that can be recovered cannot be known without performing waste sorts.

Waste sorts can reveal areas for potential expansion of recycling services, and also potential items that residents need additional information on how to recycle. Expanding recycling options will be critical as the goals for waste diversion increase over time. Sorts can also reveal material that cannot be recycled, but could be avoided if proper education efforts are in place.

The waste sorts could also be used as a regular checkup on the recycling programs to be sure they are functioning as necessary.

The sorts should also consider large item material as a way to gauge the recyclable options or prevention strategies for that waste as well.

Waste sorts and their subsequent analysis are expensive, however, so budget constraints may preclude regular inspection of the waste. However, at minimum, setting a goal of a waste sort once every five years in line with the diversion percentage increases may be the most reasonable option.

GOAL II

CONTINUE COMMITMENT TO WORKER SAFETY, AND CONTINUE MANDATING RULES AND POLICIES THAT ENHANCE SAFETY IN THE WORKPLACE

Timeline

Continuous

Background and Additional Information

Streets Division employees are the lifeblood of the organization. Without their efforts, no sustainability goals are achievable in the City of Madison. Therefore, consideration of their well-being is essential.

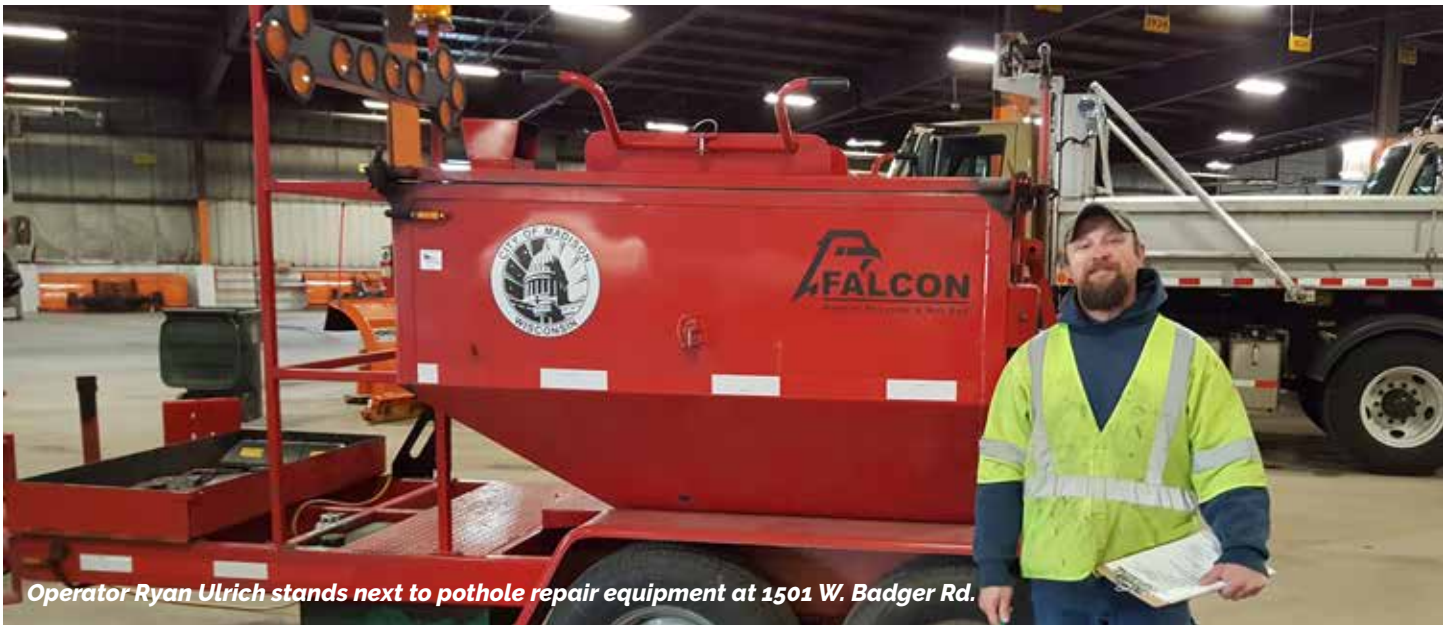
When the City of Madison transitioned to the automated collection system instead of hand-collecting waste at the curb, many workers were saved from injuries, and were saved from the harder to quantify, yet no less true, long-term impacts on a body of years of heavy manual labor.

This goal is intended to underline the Streets Division's commitment to worker safety that was illustrated by transitioning to automated collection.

The Streets Division will continue looking for ways to enhance worker safety while honoring the service commitment to Madison residents. Improvements may come in the form of equipment changes or modifications, procedure changes, or other changes as required.

The Streets Division also commits to continuing the use of the ad-hoc Safety Committee that gathers management and field personnel staff to discuss safety concerns noticed by field staff. Also, no new programs or procedures will be undertaken without carefully considering the impact on the safety and well-being of the workforce—both in the field and the administrative staff.

The Streets Division will also continue enforcing internal procedures to ensure workers remain safe on the job, such as requiring that safety vests be worn every time an employee is outside of a vehicle in the roadway.



Operator Ryan Ulrich stands next to pothole repair equipment at 1501 W. Badger Rd.