A MANUAL FOR IMPLEMENTING SCHOOL RECYCLING PROGRAMS

2006

*Adapted from the publication created by MassRecycle (The Massachusetts Recycling Coalition) in cooperation with the Massachusetts Executive Office of Environmental Affairs, Department of

Environmental Protection, 2002.

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INTRODUCTION

How This Manual Can Help You

The primary goal of this document is to outline the key elements in establishing waste diversion programs in schools since schools and their recycling programs come in all shapes and sizes. This manual will help you find the recycling system that is right for your school. Sections 2 and 3 will provide you with an overview of materials commonly recycled and the range of recycling possibilities available to schools in the state. Sections 4, 5, and 6 of this manual will guide you through planning and implementation.

Both recycling and composting share many of the same planning techniques and both are addressed by this guide. Although a complete discussion of composting is beyond the scope of this manual, educational materials referenced in the Appendix section titled *Other Helpful Resources* provide additional assistance in establishing a composting program.

2. MATERIALS COMMONLY RECYCLED IN SCHOOLS

The waste materials that are most commonly recycled in schools are, **paper**, **cardboard**, **aluminum cans, and bi-metal cans**.

The following overviews are aimed at giving you a snap shot of each material you may want to target at your school.

Paper

There are several different types of paper that can be recycled. Each of these types of paper are used in the manufacture of different products at specialized mills. For example, white paper is usually converted into tissue and toweling at what are called "tissue mills", while newspaper and magazines are reprocessed at "boxboard mills" into paperboard products like shoe boxes and pizza boxes. The mills that perform this reprocessing rely almost entirely upon private recycling firms to supply them with the material they need. Recycling firms, or more appropriately, "collectors", collect paper waste from businesses, schools and residences and then bale the material for economical shipment to these mills. In 2005, a record 51.5 percent of the paper consumed in the U.S. (51.3 million tons) was recovered for recycling. Paper recovery now averages 346 pounds for each man, woman and child in the United States. (American Forest and Paper Association)

The various paper grades have different market values. The value of the material is what helps a recycler determine if a material is "worth" collecting. If a material, such as used pizza boxes, has no dollar value to

a recycler, there will be little economic incentive to collect it. If on the other hand, a material has a higher dollar value, like white paper for example, the more likely it will be that you will find an interested collector.

The following is a list of the most common grades of paper in order of their market value, beginning with the most valuable and ending with the least valuable.

White Paper

Definition: "White paper" simply refers to any non-glossy paper that is white. The color or amount of ink on the sheet is irrelevant. Examples of white paper that you may find at your school are:

copier paper
mimeograph paper
letterhead
windowless envelopes
laser printer paper
computer paper
plain paper faxes

Each collector of white paper may have slightly varying specifications, but usually staples, paper clips, and rubber bands are acceptable in small amounts. Large clips, brads and binders usually are not. Any unacceptable "contamination" of white paper by, say colored paper or peanut butter and jelly sandwiches, may cause a recycler to decline picking up the entire load.

Key Points: *White Paper*

- ü Usually equals about 20% of your school's total solid waste by volume
- ü Has a high economic value relative to other paper wastes and is therefore desired by collectors
- ü Has stable markets and numerous collectors
- ü Most white paper collected is made into toilet tissue, toweling and market pulp (a material purchased by mills that do not have pulping equipment)

Colored Paper

Definition: Colored paper, sometimes called *sorted colored ledger*, refers to the actual color of the sheet and includes any color. Like white paper, what is printed on the sheet is irrelevant. Glossy magazines or newsprint are usually not acceptable as colored paper.

Key Points: *Colored Paper*

- Mixed with white paper, it can equal about 35% of your school's total solid waste by volume
- Has a medium to low economic value relative to other paper wastes

Mixed Paper

Definition: Mixed paper is a catch-all term and has many "definitions". In most cases it refers to just about any kind of paper, including white paper, colored paper, newspaper, magazines, telephone books, note pads, cardboard, paperboard, paper bags etc. Some collectors, however, do not allow newspapers or magazines to be included in their "mixed paper". Make certain that you are clear on your collector's definition. Markets for mixed paper are limited and notoriously fickle so setting up mixed paper recycling programs is riskier than setting up white paper programs. Mixed paper programs, however, reduce the waste stream more significantly.

Key Points: *Mixed Paper*

- Can equal up to 70% of your school's total solid waste by volume
- Much of this material is sorted by workers at paper processing facilities prior to being shipped to paper mills for reprocessing
- Mixed paper programs are convenient and require little thought about what is acceptable, but these programs are prone to "contamination" by unwanted trash

Newspaper and Magazines

Definition: Newspaper and magazines are well known materials and are easily recognizable. Most programs or collectors that accept this grade will allow glossy Sunday inserts but not "junk mail". Other acceptable sources of newspaper are circulars and advertisements printed on newsprint. Glue-bound magazines and telephone books are usually acceptable, but certain to check with your local collector.

Key Points: *Newspapers and Magazines*

- Newspapers can be recycled into new newspapers, but much of the newspaper collected in Montana is made into cellulose insulation material

Corrugated Cardboard

Corrugated cardboard boxes are one of the most recycled materials in the country. Studies estimate that over 70% of the nation's cardboard is collected for recycling. The reason for this high "recovery rate" is that, although cardboard recycling costs money, it costs less than trash disposal. Supermarkets and other large generators of cardboard therefore recycle because it saves money and it is the right thing to do.

At schools, corrugated cardboard boxes are commonly generated in the cafeteria and custodial areas. Schools that do not have a cafeteria may not generate enough cardboard to make a separate collection program worthwhile.

Definition: The term cardboard is a simplified term for corrugated cardboard. You will notice that, when viewed on edge, there is a wavy or corrugated inner section that is sandwiched between two outer layers. This inner layer gives this packaging material its strength. A colored outer layer is usually acceptable, but cardboard that is waxed or yellowish is unacceptable. Paperboard products such as cereal boxes, pizza boxes and shoe boxes are not considered to be cardboard.

Key Points: *Corrugated Cardboard*

- ü Over 70% of the nation's corrugated cardboard waste is recycled
- ü Recycling is a huge cost saver when cardboard is available in large amounts
- ü Recommended for schools with large cafeterias or other significant sources
- ü Waxed or yellowish cardboard (often hold food products) is usually unacceptable

Aluminum and Bi-Metal Cans

Over 50% of aluminum cans are recycled and each empty can is worth about one cent. School cafeterias and teacher's lounges are the biggest sources of aluminum cans, with school lunchrooms are often close behind. School cafeterias generate steel or bi-metal cans during food preparation. The recycling of these materials requires attention to safety and storage issues such as handling, odor and pest control.

Definition: Once again, definitions and specifications may vary from region to region, but aluminum cans and steel or bi-metal cans are generally collected separately. Inclusion of aluminum foil or pie plates must be determined acceptable by the recyclables broker.

Key Points: *Aluminum and Bi-Metal Cans*

- ü A used aluminum can may be recycled and back on store shelves within 60 days.
- ü Each day, Americans use over 100 million aluminum cans
- ü Americans use 100 million steel cans every day.
- ü Steel cans are often called tin cans because they are coated with a thin coat of tin to protect the food product.

Food Waste

A growing number of schools recycle their food and lawn waste by composting it. There is no substitute for cleaning your plate, but the educational opportunities associated with composting are exciting. Most

schools limit their programs to food waste generated in the food prep areas of the cafeteria, although other schools include leftovers collected from the lunchroom. Dairy products, meat and fish are typically excluded from composting programs because of odor and pest problems. Food scraps can be either composted on the school grounds or picked up by local pig farmers or composting farms. Schools can work with the Department of Environmental Quality's Solid Waste Department to receive a no-fee experimental compost facility license for pilot projects.

Key Points: *Food Waste*

- Depending on the school, food discards can represent from 20% to 50% of the total solid waste by weight
- Diversion of food waste through composting or pig farmers *(not all pig farmers collect food waste*) can provide a platform for a valuable learning experience for students

3. TYPES OF SCHOOL RECYCLING PROGRAMS

There are six main options for collecting recyclables in schools. They are:

Recycling
- Delivery of materials to a local, recycling drop-off center
- Collection by the school's current trash hauler
- Collection by a separate, private recycler
- Collection by a non-profit organization
- Collection by a contracted recycler
- Collection as part of a school district recycling program

There are two common methods of diverting food waste. They are:

Composting
- Onsite composting of food and yard waste
- Collection of food waste by farmers for pig feed or off-site composting

To help you evaluate which collection method most suits your school, each option is described. Case studies of schools from other states are available by contacting the recycling staff at Montana Department of Environmental Quality.

Delivery to Local, Recycling Drop-off Center

Ideal for:
- Schools whose current waste hauler cannot provide recycling services
- Schools that cannot meet minimum collection requirements due to lack of

storage space or other reasons
- Schools in towns with a user friendly drop-off center

In many rural and some suburban areas that are considered "out of the way" by collectors of recyclables, bringing recyclables to the town's drop-off center may be the best choice available to you. Schools that recycle in this manner usually make use of town or school owned vehicles and/or private vehicles to bring the materials to the recycling center. Programs that use a drop-off site are limited to the materials that the center accepts. Make sure to check with the drop-off manager before starting a collection program at your school.

Collection by the Current Waste Hauler

Ideal for:
- Any school with a waste hauler that offers recycling services

Trash haulers within Montana may respond to requests for recycling services. A good first step in organizing a recycling program for your school is to find out what recycling services your current trash hauler offers. A recycling program that uses a contracted hauler enjoys several advantages. Since they are already visiting your school it is logical and efficient to work with them. A second advantage is financial. In the interest of retaining your school's trash business, a trash hauler can offer a better deal to your school.

Collection by a Private Recycler

Ideal for:
- Large urban schools

Montana has few private recyclers that collect and process recyclables from residents and businesses as their chief source of business. Much recycling in Montana is done through drop-off collection points. Recyclers that do collect from businesses have specific materials that they will accept and a specific method to collect them. The best place to find a listing of these recyclers is the local Yellow Pages under "Recycling". Or call the Montana Department of Environmental Quality to find out if there is a recycler near you offering these services (800-433-8773).

Collection by a Non-Profit Organization

Ideal for:
- Small schools that private, commercial recyclers will not serve
- Schools that need special assistance in setting up programs
- Schools that want to contribute to a charitable cause

There are a number of non-profit organizations in the state that have a long history of providing recycling services as part of their mission. Non-profit organizations are known for their fundraising collection drives (programs that occur on a scheduled basis), but some offer on-going collection services. Non-profit organizations promote causes like recycling or scouting, while others seek to support groups like the physically or mentally challenged. In all cases, working with a non-profit can multiply the positive impact of recycling by also supporting a worthy cause.

Non-profits are very easy to work with and often "go the extra mile", but they do not blanket the state so there are geographic gaps in service. There is no comprehensive listing of non-profits that offer recycling collection services.

Recycling on School District Basis

Ideal for:
- ü Schools whose services, like trash removal, are arranged on a district level

Many schools in the state are organized into school districts where services, such as trash removal, are arranged on a district wide basis. In these cases it would be expedient to organize a recycling program along the same lines. This is especially true if the district's waste hauler is the best bet for recycling services. If you are working within a school district you should contact the district's business manager's office or your school superintendent's office.

On-Site Composting of Food Waste

Ideal for:
- ü Schools with kitchens and cafeterias
- ü Schools interested in merging composting with the science curriculum

Composting food waste is quickly becoming a popular topic among school teachers because it is hands-on, exciting, and ecological. School composting programs are often connected in some fashion to the science curricula. Composting food waste on school grounds is the most difficult diversion program to establish because of the ongoing maintenance that is required, but it is also the most rewarding

Collection of Food Waste by Farmers for Pig Feed or Composting

Ideal for:
- ü Rural or suburban schools near farms
- ü Schools with kitchens and cafeterias
- ü Schools that lack the ability to compost on site

Not every school has the time and energy that is required for on-site composting. Rural schools that are near farms can sometimes take advantage of a local farmer's experience by simply setting aside food waste to be picked up.

4. WHAT DO I DO FIRST?

Whether your goal is to establish a modest paper recycling program or an elaborate program to divert multi-materials, your initial steps will be identical. These steps are:

- ü Build administrative support
- ü Identify a goal
- ü Collect information about your school
- ü Check with your current trash hauler

- Look for collectors of recyclables in your area

Build Administrative Support

Even the smallest recycling program requires cooperation among the administration, faculty, custodians, parents groups and students. Programs that are successful have garnered the support and commitment from each of these groups early in the planning process. School principals have an over-arching interest and understanding of their school's functions. Teachers have a keen understanding of student abilities and educational opportunities. Custodians are expert in their awareness of the building, the flow and composition of its wastes and possible sites to store materials. Students have fun suggestions for promotion and they are willing recyclers.

It is also important to build support outside of your school(s). Many towns have Municipal Recycling Coordinators who oversee their town's residential recycling program. These individuals are an important source of information on local recycling options and they can be a valuable ally as you build your school recycling program. To find out if there is a Recycling Coordinator in your town, call your county solid waste department.

Identify a Goal

In the introduction of this guide we discussed the various reasons schools implement recycling programs. Some of the goals most schools set for their programs are:

- To use recycling as an educational tool
- To save trees and other natural resources
- To save money by diverting waste to cheaper forms of disposal (recycling)
- All of the above

It is important for you and your cadre of supporters to agree on a goal. This does not mean that you cannot change your plans as you move through this planning process, but it will be a smoother ride if there is a shared destination.

Collect Information on Your School

Think of your school as a living organism that has a function, takes in nutrients and expels waste products. For you to be able to successfully make changes in the habits of this organism, you will need to study it carefully. Seek answers to the following questions:

What waste material does my school produce?

The resident experts on waste material at your school are the custodians. Every day of every week of every school year the custodians collect and transport the waste materials to trash containers. Ask them what the school throws away and encourage them to make an "off the top of the head" guess about the relative composition of the school's waste.

Make a school project out of auditing the waste generated at your school. Have students use math skills to determine the percentage of recyclable materials being disposed of in the school garbage. A description of audit methods, along with a waste audit form are included in this section.

How are these wastes currently handled?

Make a note of how trash is moved from its point of generation to its point of disposal. Some schools build their recycling programs around the current movement of waste materials. Other schools devise separate but complimentary procedures for getting recyclables to a collection point. Note how much time is currently being devoted to waste handling. Check with an administrator to see if the custodial contract is flexible enough to allow a change in procedure.

What does it cost my school to handle and dispose of waste materials?

If you are aiming to save the school money through recycling, you will need to know how much is being spent on trash removal each year. Your head custodian, principal, business manager or superintendent should have these figures. Along with your estimates of waste composition, use this data to estimate cost savings. For example, if white paper is 20% of the total trash by volume, then a white paper recycling program could conceivably save your school twenty percent of the trash budget. Make sure to check the contract to see if reducing the waste stream's volume will in fact reduce your disposal costs. Some trash removal contracts charge a per pick-up fee and not on the actual volume of waste in the dumpster. In these cases, recycling may not result in a reduction in disposal costs unless the number of times the trash collector picks up is reduced. If recycling would not affect the school's expenditure, consider re-negotiating the contract with the waste hauler. You can also wait until the contract ends and amend the next contract to reflect a reduced number of trash pick ups.

Time is money too. Custodians are paid employees. The more time spent on handling the trash, the less custodians are free to accomplish their other tasks. Schools that include the custodians in the recycling program find that they end up spending less time overall on trash removal. This is especially true with paper recycling programs since recycling containers may not need to be emptied every day as compared to trash barrels. If twenty percent of the trash does not need to be collected every day, the custodians may see this reflected in the time they spend handling the school's waste stream. Make a projection about the potential savings.

What are the possible storage sites for recyclables until collection?

With the exception of some pig farmers, no recycling service will visit your school on a daily basis. You will, therefore, need to store materials until a sufficient quantity is available to make collection economical for the collector. Finding an adequate storage area is sometimes difficult since most buildings are not designed with these recycling needs in mind. The layout of your building, the minimum amount of material you will need to store, and other important considerations like fire

codes, student health, and safety will be limiting factors in finding a suitable site. Start by consulting with the head custodian and investigate areas near where trash is currently kept. Check with the local fire marshal about codes and storage rules. Keep in mind that the site needs to be convenient for all involved. Some schools partially side step storage snags by aggregating material on the day of collection.

Check with the Current Trash Hauler

The school's waste hauler may also offer recycling services. Check with your current trash hauler on recycling options. Your hauler is a good place to start since some trash removal contracts contain language that gives the contracted hauler first choice on any recyclables in the waste stream. As is evident from the variety of school recycling programs, waste haulers are not always the only, or best, option.

Approach your hauler the same way you would approach any other business whose services you are interested in and be sure to get answers to the following questions:

- ü What materials do you collect?
- ü How must materials be prepared in order to be picked up?
- ü How much do we need to store before you will make a pick up?
- ü Do you provide any storage equipment such as large bins (hampers or toters)?
- ü If you do not provide equipment, what containers will you service?
- ü Are there any charges for your services or containers?
- ü Do you work with any other schools?
- ü Will you be able to help us through the set up process?
- ü Do you have any promotional materials, such as posters or signs, that we can use?
- ü Will your service be likely to change in the future?
- ü Do you require a service contract?

Look for Recyclers in Your Area

If your current hauler is unable to provide recycling services, or if you prefer not to use them, shop around for other recycling options. Use the above set of questions for querying other service providers. *(The next chapter of this guide will discuss tips for choosing a recycler.)* The best places to find recycling services are:

Municipal Recycling Coordinator or Solid Waste Management District

Your local Recycling Coordinator of District Manager is familiar with area recyclers. To find your coordinator call your town's Public Works or Health Department.

Yellow Pages

Most recycling services are listed in the Yellow Pages under "recycling services", "recycling centers"

or "recycling equipment".

Performing a School Waste Audit

*Adapted from San Mateo County, CA.

The objective of a school waste audit is to introduce the idea to your students and staff that garbage doesn't just disappear once it is collected in your garbage can. You can't just throw it away. It can be compacted, buried, or changed to ash and vapor but the garbage must all go somewhere. This audit will show students the quantity of their waste at school that is recyclable. You can conduct a waste audit of your classroom, school or home using these concepts.

Methods	
Audit A	Have teachers and students save the garbage from their classroom for one day.
Audit B	Have students conduct a one day audit of classroom and food service waste for one lunch period for the entire school.
Audit C	Have students conduct a visual waste audit of the contents of the school dumpster.

Background

How aware are we of the waste we generate? Studies have been done to analyze both the contents of the national waste stream and the waste stream of schools. Paper makes up the largest component of schools' waste streams. [Source: California Integrated Waste Management Board (CIWMB), Close the Loop A–46.]

Each American throws out about four to five pounds of waste per day. Each student produces about half a pound of waste per school day. All of this adds up to a problem because America's old landfills are filling up quickly… and new safer landfills are very costly to construct (Source: CIWMB, Close the Loop A–46).

Material needed: (Copy the Waste Audit Form)

Waste Audit A:

Labeled garbage cans or containers for each classroom or area. These will be used to sort two types of waste (wet waste and dry waste see table below)

Plastic garbage bags for each of the containers

Two washable plastic tarps

Plastic gloves for each student

Change of clothes and washable shoes to wear for the activity

Parent/guardian permission slip

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Waste Audit B:

Four garbage cans labeled (two for wet waste and two for dry waste)

Plastic garbage bags for each of the containers

A scale for weighing the materials in pounds.

Two washable plastic tarps

Plastic gloves for each student

Change of clothes and washable shoes for students

Parent/guardian permission slip

Waste Audit C:

Gloves and goggles for the students conducting the audit

Litter pick–up stick (Your school district maintenance staff may have this item)

Parent/guardian permission slip

Procedure for waste audits A & B:

A. Find out if parents and your school administrators will allow the waste audits. Send home permission slips. Students who are not allowed to participate can be responsible for writing the analysis of the audit and charting the activity.

B. Notify your school custodian of the waste audit. Coordinate with your food service staff to make sure that wet waste generated from the cafeteria is separated from the dry waste.

Wet Waste	Dry Waste
Leftover lunch items, sandwiches, fruits, yogurt, cheese, chips, breads, soups, milk, contaminated paper trays or pizza boxes, used paper towels and tissues.	Candy wrapper, empty potato chip bag, lunch bags, bakery containers, all types of wrappers (i.e. candy, cookies), empty soda or water bottles, any type of paper, plastic wrap or packaging, catalogs, magazines, cardboard, and paperboard.

C. We recommend contacting your local hauler to obtain literature on the recyclables collected at your site in order to recycle the material at the end of the audit. The information from your hauler will also help the students to determine what is recyclable in your local recycling programs.

D. Make sure your activity is announced to the school and remind the students before each lunch period of the activity.

E. It is recommended that you appoint students during the lunch hour to help students sort their waste into the appropriate container.

F. Your class will be divided into teams, the sort team, the weighing team, the collection of container team, and the analysis team.

G. If approved, provide the students who will be handling the wet waste bags with goggles and heavy gloves. Spread out two washable tarps and locate the sorting containers as shown on the diagram. Students will empty one bag on to the tarp parallel to the containers. Students will not be sorting the wet waste bags, only weighing.

H. You are now ready to sort the materials into the appropriate collection container and then weigh and track your results.

Container Legend	
Ww	Wet waste sorting area
MP	Mixed paper
NP	Newspaper
OW	Other waste not classified
PW	Plastic wrap and misc plastic 3–7
AL	Aluminum can, steel cans
PB	Plastic Bottles # 1 & # 2
OCC	Cardboard

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Procedures for waste audit C:

A. If sorting is not allowed at your site then conduct a visual waste audit of the materials found in the dumpster. Use the litter pick–up tool to break apart the bags and inspect what you find and fill out the table below.

B. We recommend contacting your local hauler to obtain literature on what is recyclable through your local recycling programs.

Some helpful conversions:

Estimating Weights	
One Cubic yard	Est. wt. (in lbs.)
Whole bottles	500–700
Aluminum cans	50–70
Aluminum cans (crushed by hand)	250–430
Steel cans	150
Steel cans flattened	850
Newspaper (not compacted)	360–505
Mixed paper (flat– not compacted)	380

Discussion/Questions

1. Graph your results of the school waste audit. Compare your data to State or U.S. E.P.A. data.
2. Ask students to conduct a survey of school–wide attitudes towards Reducing, Reusing, Recycling and Rotting waste. Some of the questions may be: Do you recycle everything that you can? Would you recycle an aluminum can in a recycling bin if it was located a few feet away, or would you put it in the trash can, which might be closer? If you are not recycling, why not? What would it take to get you to recycle more? Do you make double–sided copies? Do you make your own lunch? If you do make your own lunch, do you put your lunch in reusable containers? Do you have a compost bin? Compile the result of your survey and share it with your school.
3. How can you educate each other and the rest of the school in order to reduce/re–use/recycle materials?
4. How many people say they are recycling regularly? How many say they are not? What are their reasons for not recycling, and what do they say would convince them to recycle more (if they are now recycling less than they could) or recycle at all (if they are currently not recycling)? Discuss, analyze, and brainstorm plans to improve participation.

Permission Slip

On (date)_____our class will be participating in a study of waste generated by the school. This will involve the handling of school garbage from dumpsters. Students will be provided with gloves and goggles, we will coach them in safety procedures, and every precaution will be taken to ensure your child's safety. A faculty member will be present. We need your permission for your child to participate in this activity. If this meets your approval, please sign the statement below.

If you have any questions please contact _____at School.

My child, _____has my permission to participate in the school waste audit to be conducted at School.

Parent signature: _____ Date: _____

Insert PDF page: School Waste Audit

G:\AEPP\BCAS\Waste Reduction\School_P2\School_Audit_Form.pdf

5. WHAT IS NEXT?

Until now, you have been doing simple reconnaissance. Now you will begin to make some decisions based on the information that you have collected. If you have not run into any snags with capturing administrative support or finding recycling services, the next steps are:

- ü Target Materials
- ü Choose a Recycler
- ü Identify a Coordinator for Your Program

Target Materials to Recycle

You have had an overview of commonly recycled materials in schools and you have looked around your school and spoken with the custodians about your school's waste products. You have also collected information on recycling services in your area. You are now ready to make a decision. Target the waste materials for which you have the following:

- ü Significant amounts in your school's waste stream

- A sound, affordable and available recycling option
- A suitable storage space

Choose Your Recycler

In cases where there are more than one option, consider the following qualities in selecting a collector:

- Service: Choose a firm that most suits your school's needs. Remember that good service is invaluable.
- Price: Some recyclers charge for their service, some collect recyclables for free, some charge a rental fee for their containers. Balance price with service.
- Willingness: Find a company that wants to serve you. An under enthusiastic recycler will be a headache.
- Equipment: Not all vendors offer the same equipment. Choose the recycler that has the equipment that works for you.
- Educational Materials: A recycler that provides signs, posters, curriculum, etc. will save you time in promoting your program.

Identify a Coordinator for Your Program

A committee works well during the planning phase because it spreads the work load and involves different points of view. Be certain that your committee includes custodians, administrators, teachers and parents (and students if possible). Once the program begins, however, there should be one person designated as the Recycling Coordinator to oversee operations. The coordinator position should be filled by a teacher, custodian or an administrator. The coordinator is usually responsible for delegating or carrying out the following tasks:

- Arranging to have the chosen vendor deliver any necessary equipment
- Making sure the program is adequately announced and promoted
- Making sure containers get placed in all the appropriate areas
- Making sure that everyone at the school is educated about the collection process
- Arranging for pick ups as needed
- Monitoring the program's success
- Letting everyone know how much has been diverted
- Contacting the local fire chief or marshal about fire codes and storage issues

6. PLANNING CHECKLIST

A good recycling or diversion program is the result of good planning. Use the checklist below as a guide to help you cover all of the key program elements.

___ **Materials Targeted:** *What will be recycled?*
___ **Preparation of Materials:** *How must they be prepared or sorted?*
___ **Minimum Collection Requirements:** *How much must be stored?*
___ **Internal Collection Method:** *Who collects the materials and how?*
___ **Internal Collection Equipment:** *What equipment will be necessary?*
___ **Storage Site(s):** *Where can you store recyclables until they are picked up?*
___ **Hauling:** *Who will be responsible for what?*
___ **Promotion:** *How will the recycling program be communicated and explained?*
___ **Evaluation and Monitoring:** *How will the program be managed?*
___ **Educational Tie-In:** *How will the teachers support recycling in their lessons?*
___ **Costs:** *What will be the cost of the program?*
___ **Benefits:** *What are the savings? What are the indirect benefits?*

Materials Targeted

By this point you have already determined which recyclable waste materials are being discarded. You also have determined which materials have collection options. For each of these materials identified, plan for the following elements.

Preparation and Handling

Whether you are collecting bottles and cans or white paper, the recycler you have chosen will have certain specifications for material preparation. For example, bottles and cans usually must be at least emptied, white paper cannot have "contaminants" such as newspapers, crayons or Mighty Monkeys lunch boxes mixed in. Be certain about what is accepted and what is not accepted.

Minimum Collection Requirement

For all companies that collect recyclables, there is a minimum amount of material that must be accumulated before it becomes cost effective to send out a truck and a driver. Be sure to note how much material you will need to store.

Internal Collection Method

Consider the flow of recyclables from their point of generation to their point of collection. Who will handle and transport these materials? Some schools rely exclusively upon custodians (recycling is incorporated into their job description), while other schools have designated students, or a club that

collects materials on a schedule. A collaborative collection effort between staff and students works very well.

Internal Collection Equipment

Most schools that have instituted paper recycling have a separate container for recyclable paper in each classroom. These containers can be as simple as cardboard boxes or as standard as a municipal curbside recycling container. These smaller containers must then be emptied into a larger container. *Most recyclers will supply this larger barrel type container.* Food diversion programs usually require, among other items, buckets and 30 to 40 gallon barrels with wheels. Make a list of all of the equipment that you will need.

Storage Site(s)

This is often the place where school recycling programs get derailed. If you cannot find a suitable site, consider a program where wheeled recycling containers are rolled from all corners of the school to the pick up point on the day of collection. Vocational schools or high schools with shop classes have the opportunity to build outdoor storage sheds for recyclables. Remember to check with the custodians about local fire or health codes; be certain that your planned storage site is safe and acceptable to local inspectors such as the fire marshall.

Hauling

Make certain that you and the recycler agree on all of the terms of the arrangement. If you agree to be serviced on an as needed basis (as opposed to regularly scheduled pick-ups), check to see how far in advance you will have to call for a pick up. It should also be clear to what extent the hauler will go to pick up material. Will they enter the building? How will they handle contaminated loads? Will the hauler simply leave the material? Will you be charged an extra fee for such loads, or will the hauler leave the material and charge you an extra fee as well?

Promotion

Do not skimp on communication. Posters, public address announcements, classroom announcements, and kick-off assembly programs are important tools in getting the word out. Sending information home with students is also effective. You want to motivate students and staff to participate *and* you want them to know exactly what is expected of them. Poor participation or improper participation can ruin even the best made plans.

After the program has been started, plan to let the school know how well it is doing. Many schools have had good motivational success with bulletin board murals that display the number of trees saved, pounds of food diverted, etc. Consider identifying a "Recycler of the Month" and celebrating their accomplishments.

Evaluation and Monitoring

Very few recycling programs run by themselves. It should be the job of the school recycling coordinator, or the coordinating committee, to check the program's progress on a periodic basis. Tonnage totals, participation rates, resources saved, dollars earned or saved are each useful tools for evaluating the impact and progress of the program.

Classroom Support and Educational Tie Ins

Schools with successful diversion programs often support these programs with classroom discussion. At a minimum, teachers should support the program through announcements, reminders and, of course, participation. More importantly though, the concepts of resource conservation and ecology will flourish and have extra meaning if teachers use the recycling program as a vehicle for discussion.

Costs

There can be an initial cost to starting a waste diversion or recycling program. There may also be ongoing costs. Examples of initial costs are barrels, buckets or other recycling containers, and promotional materials like paper for posters. And then, of course, there is the value of staff time. Ongoing expenses may consist of collection fees, rental fees or the replacement of damaged or lost containers. From the outset you should know what your expenditures will be and how they will be paid.

Benefits

Some benefits from recycling or composting are measurable and others are not. Throwing away less solid waste can almost always translate into direct savings for the school. Work closely with the administration to measure these savings and lobby to have the amount of the savings added to the school budget if possible. Recycling also conserves natural resources, provides jobs and reduces the impact of manufacturing processes on our air and water. These tangible benefits can be calculated and put into the perspective of one school's impact, but the hardest and perhaps greatest benefit of all to measure is the future impact of students who learn to use natural resources wisely and efficiently.

7. TIPS FOR RURAL SCHOOLS

Schools in rural sections of Montana face a special set of obstacles when setting up recycling programs. Often these schools are small and too far from potential collectors of recyclables to make collecting from them economical. If you find your school to be in this situation, please consider the following tips:

- Cooperate with municipal agencies, businesses or other schools to pool materials
- Collect only the highest value recyclables, such as aluminum or white paper and plan for a larger storage space than is required of most suburban or urban schools
- Try on-site composting

Pool Your Recyclables

If you are having trouble enticing a collector to visit your school because of distance or the amount of recyclable materials available, consider cooperating with the municipal public works or health departments, or a local business to pool your recyclables.

Municipal Agencies

Check to see if town offices have a recycling program and seek to join their effort. If they do not, see if they would like to collaborate. By increasing the amount of materials collected and aggregating them at some common storage site, you may be able to capture the interest of a distant collector. Check with your Municipal Recycling Coordinator or Regional Solid Waste Management District.

If your town has a drop-off center that accepts paper, but your school cannot get it to the site, ask the Public Works Department if they will pick it up and deliver it to the site. If your DPW agrees to collect your school's recyclables, be sure to agree on how materials will be stored and how often they will be picked up.

Local Businesses

If your school cannot recycle because it does not qualify for a free pick up from a collector, consider asking a local business to "donate" the cost of the pick ups. Again, check with your Municipal Recycling Coordinator or the local Chamber of Commerce for suggestions of potential business partners.

Collect the Highest Value Material and Plan to Store More

If distance is discouraging a recycler from visiting your school, give serious thought to collecting only the highest value materials like white paper or aluminum cans. At some point, some definable amount of paper will become "worth it" for a recycler to make a long journey. Find out what that amount is and be creative in finding ways to store it. (Be sure to check with the local fire marshal about storage guidelines.) As was mentioned earlier, getting a high school shop class, Jaycees, Elk's Club etc. to build and/or finance an outdoor storage shed for recyclables is a valuable community project.

Try On-Site Composting

This is a diversion program that does not necessarily require a private waste management company. You can do this right at your school. Check the Appendix of this manual for resources on establishing a composting program at your school.

APPENDIX A. OTHER HELPFUL RESOURCES

Department of Environmental Quality (DEQ)
Business and Community Assistance Program
Recycling and Market Development Staff
1100 Last Chance Gulch
P.O. Box 200901
Helena, MT 59601
406-841-5200
800-433-8773
http://www.deq.mt.gov/

Earth's 911
1-800-CLEANUP
http://www.cleanup.org/

Headwaters Cooperative Recycling
PO Box 1570
Helena, MT 59624
406-443-3101
manager@headwatersrecycle.com
http://www.headwatersrecycle.com/

Montana Recycling Association
2905 North Montana Avenue, PMB 246
Helena, MT 59601
406-461-9106
ask@recyclemontana.org
www.recyclemontana.org

Resource-Full Recycling
Educational presentations on reuse, recycling, consumer strategies, sustainability and exhibit of 100 things other people throw away.
Susan Duncan
1050 Thorpe Road
Belgrade, 59714
406-388-1809

Pacific Steel and Recycling
P.O. Box 1549
1401 3rd Street NW
Great Falls, MT 59403

406-727-6222
http://www.pacific-recycling.com/

Rocky Mountain Recycling
1909 Wyoming St.
Missoula, MT 59801
406-273-2013

Recycle City by EPA
An interactive education program for children to compare Recycle City and its neighbor Dumptown.
http://www.epa.gov/recyclecity
Kim Bartels, Recycling Coordinator
303-312-6346
bartels.kim@epa.gov

Montana State University Extension Service Solid Waste Education Program
Youth Education Topic Hub
http://peakstoprairies.org/topichub/

Allied Waste Services of North America, LLC
Largest solid waste hauler in Montana.
P.O. Box 8449
Missoula, MT 59807-8449
406-543-3157

Waste Connections
P.O. Box 966
Miles City, MT 59301
Phone: 406-232-0109

Montana Waste Systems, Inc.
P.O. Box 2582
Great Falls, MT 59403
Phone: 406- 761-2545
Fax: 406-761-6391

Educational Materials

Recycling

Integrated Waste Management Plan 2006

Montana Department of Environmental Quality,
P.O. Box 200901, 1100 Last Chance Gulch Helena, MT 59601
http://www.deq.mt.gov/

High School Environmental Center, EPA
This helpful website provides links to information on Recycling, Solid Waste, and Hazardous Waste, as well as other topics such as water, conservation and ecosystems.
http://www.epa.gov/highschool/waste.htm

Trash Goes to School, Cornell Waste Management Institute
This website provides age-appropriate activities for students and teachers regarding recycling, composting and solid waste management.
cwmi.css.cornell.edu/TrashGoesToSchool/TrashIntro.html

School Waste Reduction Guide
Association of Vermont Recyclers
P.O. Box 428, Plainfield, VT 05667
802-454-8400
vtrecyclers.org/wastekit/index.htm

Teaching Resources – Waste and Recycling, EPA Age appropriate activities and information for teachers.
www.epa.gov/teachers/waste.htm

Composting

Health and Safety Guidance for Composting in the School Setting
Cornell Waste Management Institute
This website provides technical and hands-on advice on composting, including the fact sheet listed above.
cwmi.css.cornell.edu/Composting.html

Bottle Biology, An Idea Book for Exploring the World Through Plastic Bottles and Other Recyclable Materials, 1993
The Bottle Biology Project, Department of Plant Pathology, University of Wisconsin
Kendall/Hunt, Dubuque Iowa

Curriculum Library
The Center for Environmental Education Online contains curriculum covering many topics, including school composting.
www.ceeonline.org/curriculum/

School Composting — The Next Step in Recycling
Establishing and maintaining a successful school-wide composting program for cafeteria food scraps (provided by the Connecticut Department of Environmental Protection). dep.state.ct.us/wst/compost/schmanual.htm

Worm Composting

Vermicomposting
Journey to Forever
This website contains extensive information on composting with earthworms.

journeytoforever.org/compost_worm.html

Composting with Red Wiggler Worms
Canada's Office of Urban Agriculture
www.cityfarmer.org/wormcomp61.html#wormcompost

APPENDIX B. GLOSSARY

aluminum: a light silvery-white metal made from bauxite ore that can be easily bent of crushed, but is highly resistant to oxidation (rust)

collector: an individual or company that picks up recyclable materials that have been set aside for recycling; also can refer to an individual or company that collects trash for disposal

commingled containers: glass, metal, bi-metal, and plastic containers mixed together

compost: decayed organic waste that has changed into humus

composting: the conversion of organic materials to humus my microorganisms; an effective solid waste management method for reducing the volume of the organic portion of the waste, including lawn clippings, leaves, kitchen scraps and manure

conservation: the planned management and wise use of natural resources to minimize their loss, exploitation, neglect and waste

consumer: a person who buys goods or services

contamination: an industry term used to refer to the sullying, soiling and ruination of one material by another; when one recyclable material is mixed with another undesirable material, the recyclable material is thus considered contaminated

container: a vessel used to hold, protect, advertise or convey consumer products such as food, liquid or other loose materials, for example, jelly jars, aluminum cans, yogurt cups; a temporary storage bucket, bin or barrel used for the accumulation of recyclables prior to collection

decompose: to break down into constituent parts or basic elements; decomposition of organic waste materials by bacteria is an essential life process because it makes essential nutrients available for use by plants and animals

dumpster: a large, outdoor metal container that is designed to hold trash or recyclables until they can be collected; dumpsters are designed to be emptied into a garbage type truck through the use of a winch system

ecology: the scientific study of the relations of living things to one another and to their environment

ecosystem: a system made up of a community of living things and the physical and chemical environment in which they interact

environment: all of the conditions, circumstances, and influences surrounding and affecting the development or existence of living things

garbage: spoiled or waste food that is thrown away; generally defined as wet food waste and excludes dry material (trash); this term is often used interchangeably with the word trash

glass: a transparent, inorganic, non-porous, impermeable material produced by melting silica sand with limestone, with the addition of soda ash for strength and chemical durability

hauler: an individual or company that collects and hauls materials from one place to another

humus: organic material consisting of decayed vegetative matter; provides nutrients for plants and increases the ability of the soil to retain water

landfill: a large outdoor site for the controlled burial of solid waste by spreading it in layers and covering it with soil; new regulations for landfills call for special engineering techniques to reduce hazards to public health and safety

manufacture: to make new products from raw materials, especially on a large scale with machines

materials recycling facility (MRF): a facility where recyclables are sorted and processed for sale

natural resources: valuable, naturally-occurring items such as plants, animals, minerals, water, and air which are used by people to help make things such as energy, food, clothes, buildings, etc.

packaging: the wrappings, container, or sealing used to protect, identify and advertise a product

paperboard: a lightweight packaging or backing material that is made from various low-grade paper fibers such as newsprint; this material is used in the manufacture of cereal boxes, shoe boxes, pizza boxes, note pad backing, etc.

paper mill: a large, commercial facility that manufactures paper products from pulp; paper mills either buy pulp or make it themselves from wood, waste paper (recyclables) or other sources of cellular fiber

paper processing facility: a commercial, state or municipally run enterprise that accepts loose paper from collectors and bales it in preparation for shipment to paper mills

plastic: any one of many human-made materials consisting of carbon in combination with hydrogen, oxygen, nitrogen, and other organic and inorganic elements which are produced by polymerization, and which can be molded, extruded, or cast into various shapes and films

polyethylene: a common plastic used to make plastic bags (low density) and milk bottles (high density)

polystyrene: a common plastic used to make utensils, and in its expanded form, the packaging and serving material sometime referred to as "Styrofoam"

pulp: a soft, moist, sticky mass of fibers made of wood, straw, etc., and used to make paper and paperboard; the act of reducing fibers to a soft, moist, sticky mass.

recovery rate: the rate at which recyclable materials are recovered for reprocessing; is usually expressed in terms of a percentage of the total recyclable material available

recycler: an individual who sets materials aside for eventual recycling; an individual or company that collects materials that have been set aside for recycling; a company that remanufactures recyclables into similar or new products

recycling: using something over again; the collection and reprocessing of a manufactured material or waste product for reuse

either in the same form or in the manufacture of the same or a different item

recycling center: a site where manufactured materials are collected and sold for reprocessing

recycling coordinator: a volunteer or paid staff person hired or appointed by a school, municipality, waste district or company to coordinate and oversee various recycling functions including educating, promoting, planning, monitoring, evaluating, and refining

refuse: a general term for solid waste materials or trash

repulp: to return previously manufactured paper products to a pulp form, usually for the purpose of manufacturing recyclable waste paper into new paper products

reuse: to extend the life of an item by repairing or modifying it, or by creating new uses for it

solid waste: all solid and semi-solid wastes, including garbage, rubbish, ashes, industrial wastes, demolition and construction debris, and household discards (appliances, furniture, equipment)

solid waste management: the controlling, handling, and disposal of all solid waste; one goal is to reduce waste to a minimum

specifications: the rules, guidelines, or requirements that manufacturers and recyclers use to guarantee a standard quality in the materials they accept

Styrofoam: a rigid polystyrene plastic that uses petroleum as a resource base (see polystyrene)

tipping fee: a charge to deposit waste in a landfill or transfer station, or to dump recyclables at a recycling facility

toter: a two wheeled, lidded, plastic container of either 64 or 96 gallons in size that is used to store recyclables or trash until collection

transfer station: an intermediate location used to collect and consolidate solid waste or recyclables, which are then taken elsewhere (for example, a distant landfill or market)

trash: material considered worthless, unnecessary, or offensive that has been discarded; generally defined as dry waste material, excluding food waste (garbage) and ash; this term is often used interchangeably with the word garbage

waste: anything that is discarded or not considered useful; the wanton act of discarding materials without regard to their value, reuse, or recycling

waxed cardboard: regular cardboard that has a waxy outer layer applied so that it can safely and easily be used to package and transport produce, fish or other non-dry items. *Not always accepted – be sure to check*

yellow cardboard: an industry term referring to low quality cardboard that is identified by its yellowish tint; this material is usually originates in Asia

APPENDIX C. Collection and Storage Options

Equipment

- ü Boxes, wastebaskets or curbside type containers in classrooms
- ü Deskside boxes or containers in administrative areas
- ü Barrels or toters (34, 65 or 98 gal wheeled containers) in areas of high generation like near copy machines
- ü Larger containers such as hampers, toters, and barrels are used to hold the paper until pick up
- ü Most of the equipment can be provided by the recycler for either for free or on a rental basis

Internal collection

- ü Students and staff recycle into nearest container
- ü Designated students or staff empty classroom containers into storage containers
- ü Storage containers, if spread about the school, are brought to central storage by custodians or students

Storage

- ü A site within the building that is large enough to handle the minimum amount the recycler will ask you store is required
- ü Central storage site should be near a loading dock or other area convenient for the recyclers and custodians
- ü Storage site should not block egress or violate other fire and safety codes.

Minimums

- ü None if you are bringing this paper to a local drop-off center
- ü Recyclers will specify the amount of paper they need you store before they will come to pick it up
- ü The minimums may vary depending upon the grade of paper you are recycling
- ü Expect to store at least 1,000 lbs. of white paper for a free pick up

Hauling

- ü Volunteers bring paper to local drop-off
- ü School department brings paper to local drop-off
- ü Trash hauler collects recyclables as part of rubbish contract
- ü Separate, private recycler picks up materials for recycling
- ü Non-profit organization picks up materials as a way of supporting their cause

Costs

- ü Volunteer time and energy

- White paper can be picked up for free if minimums are met
- Colored or mixed paper may have a pick up fee
- Toters or other equipment may carry a rental charge
- Payment for paper is possible, though unusual, if minimums are met

Benefits

- 17 trees are spared for every ton of paper recycled
- Making paper from scrap paper is a cleaner process than making paper from wood pulp
- Recycling can save your school money through avoided disposal costs
- Students see practical application of resource conservation

CARDBOARD

Equipment

- Wheeled dollies or carts to bring cardboard to storage container
- Outside dumpster or compactor to store cardboard
- Hampers for cases where internal storage of cardboard makes sense
- Wooden pallets for instances where strapping flattened cardboard to a pallet makes sense

Internal collection

- Cafeteria workers set aside cardboard for pick up by custodians
- Custodians flatten cardboard
- Cardboard is placed in or on storage container

Storage

- A central storage site must be identified
- Cardboard is usually stored outside in a dumpster until pick up by a recycler
- If storing the cardboard in hampers or strapped to pallets, find an indoor storage site that is large enough to handle the minimum amount the recycler will ask you store
- Central storage site should be near a loading dock or other area convenient to custodians and recyclers
- Storage site should not block egress or violate other fire and safety codes

Minimums

- None, if you are bringing this material to a drop off site yourself
- Recyclers will specify the amount of cardboard they need you store before they will come to pick it up
- The minimums may vary depending upon the hauler, but usually are around 3 cubic yards

Hauling

- ü Volunteers bring cardboard to local drop-off
- ü School department brings cardboard to local drop-off
- ü Trash hauler collects cardboard as part of rubbish contract
- ü Private recycler picks up cardboard

Costs

- ü Pick up charges are to be expected for cardboard
- ü Rental fees for dumpsters, compactors are the norm
- ü Flattening requires time and energy

Benefits

- ü Recycling cardboard saves trees.
- ü Recycling cardboard can save your school money

BEVERAGE AND Bi-METAL CONTAINERS

Equipment

- ü 65 or 98 gallon toters are usually supplied by the recycler
- ü Other suitable containers if you are bringing this material to a local drop-off center

Internal collection

- ü Containers are collected in separate bins that are placed in food prep areas
- ü Containers are collected in separate bins that are placed in the lunch and staff rooms
- ü Containers are rinsed and de-lidded
- ü Custodian or students brings containers to central storage

Storage

- ü A central storage site must be identified
- ü If using a recycler, find a site that is large enough to handle the minimum amount the recycler will ask you store
- ü Central storage site should be near a loading dock or other area convenient to custodians and recyclers

Minimums

- ü None if you are bringing this material to a drop off site yourself

- Recyclers will specify the amount they need you store before they will come to pick it up
- The minimums may vary depending upon the hauler, but three 90 eight gallon toters is a good estimate

Hauling

- Volunteers bring cardboard to local drop-off
- School department brings cardboard to local drop-off
- Trash hauler collects cardboard as part of rubbish contract
- Private recycler picks up cardboard
- Non-profit organizations collect redeemables as a fund-raiser

Costs

- Pick up charges may be charged for bins
- Rental fees for toters are not uncommon
- Staff time in rinsing and preparing bottles and cans

Benefits

- Recovered glass, aluminum and tin are important feed stocks for manufacturers
- Recycling metals and glass reduces the impact of mining operations
- Recycling in the school compliments recycling in the home
- Recycling bottles and cans saves your school money

- Central storage site should be near a loading dock or other area convenient to custodians

FOOD WASTES (This overview combines both on-site composting and collection by farmers.)

Equipment

- Thirty four gallon wheeled barrels lined with plastic bags for use in food prep areas
- Five or ten gallon plastic tubs for lunch rooms
- Wheeled cart for transporting food waste to outdoor compost site
- Outdoor "backyard type" composting vessel or,
- Self made compost bin
- Pitchfork or spade
- Heavy duty thermometer
- Wheel barrow

Internal collection

- Food waste is placed in containers as it is generated in the food prep areas
- Food waste can be collected as it is generated in the lunchrooms

- Student monitors oversee lunchroom food waste diversion
- Custodian or students brings food waste to outdoor compost site or pick up spot by composter

Storage

- An outdoor compost site away from the building must be identified
- If you are having your food scraps collected by a farmer or other composter, a suitable outdoor storage area that is large enough to hold the minimum amount required for pick up, must be identified

Maintenance

- Compost piles need to be maintained in order to be successful
- Maintenance includes checking and turning the pile
- Finished compost should be removed from the composter, as it is ready, for use on the school grounds

Hauling

- Local farmer or other composter collects food waste from the school at an agreed upon interval

Costs

- The school will have to purchase the necessary equipment to compost or set aside food for farmers or other composters
- Staff time in coordinating and maintaining compost site

Benefits

- Educational opportunities surrounding composting are enormous
- Schools that generate a significant amount of food waste can save money through composting
- Compost can be used on the school grounds or in gardening projects