September 2016, Director Office of Sustainability, Rochelle Owen

Dalhousie - Waste Management and Bin Standards

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Dalhousie University Campus

150+ buildings/houses in downtown Halifax and Truro, Nova Scotia, Canada.

Includes 5.5 million gross square feet of building space.

A campus population of approximately 25,000 (18,500 students, 6500 faculty and staff).

Four Campuses: Studley, Carleton, Sexton, Agricultural

Two District Heating Systems

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Inspiring Minds

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SOLID WASTE MANAGEMENT PLAN

2015 – Version 1

Dalhousie key actions for the next five years

Policies/ Plans	• Finalize and publicise waste management plan. • Create paper and green Information Technology (IT) policy that focuses on paper reduction actions. • Conduct a business case on the cost/benefits of changing collection, sorting and processing procedures to reduce costs of pick ups and increase diversion. This could include developing different partners. • Explore user pay for ancillary services. • Require all new offices to receive blue-bin with a mini-waste bin attached instead of a waste bin. • Insert waste management diversion clauses and criteria in contracts, RFPs, guidelines, and tenders. Recent examples include outlining regulations in RFPs, requirements for tonnage receipts, and waste management plans.
Education & Communication	• Continue to conduct employee and student orientation education activities during Frosh week and Waste Reduction Week. • Produce and promote Dal Waste Sorting Guide for all Faculties and Departments. • Add a waste management challenge as part of the Dalhousie Eco-Olympics. • Promote sustainability guide for special events which includes a waste minimization section. • Pilot test new posters for above four-bin stations.
Procurement	• Focus on standing offers for key commodities to control purchasing and sustainability features such as waste minimization.
Measurement & Monitoring	• Perform yearly waste audits. • Finalize baseline tonnage figures for all material streams. • Conduct an input analysis of all material streams to compare to output tonnage to identify inefficiencies. • Conduct further research on C&D and lab waste.
Processing	• Sort material for added-value re-use and recycling (ex. building on the success of programs such as acetone recycling and chemical exchange program). Ideas including purchasing balers for cardboard and paper to sell material for a price instead of paying for it to be picked up. • Remove/reduce single waste bins on campus in areas such as classrooms, kitchens, offices, and hallways. Add more four bin-stations were needed.

A Look at Approaches

Four Rs

- Conservation-use less
- Maximize high value use
- Ultimate aim no disposal

Circular economy

- Focus on using disposal items as a resource – no waste
- High value use
- Recovery
- Sharing

Observations

- Sharing and recovery are a method of conservation
- Focus on disposal items as product
- Similar concepts in energy world

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Strategy Focuses

A. Reduce amount of commodities (waste efficiency)
B. Improve recycling and compost rates
C. Tracking and Promotion of accurate weights and progress
D. Education – Awareness to Knowledge

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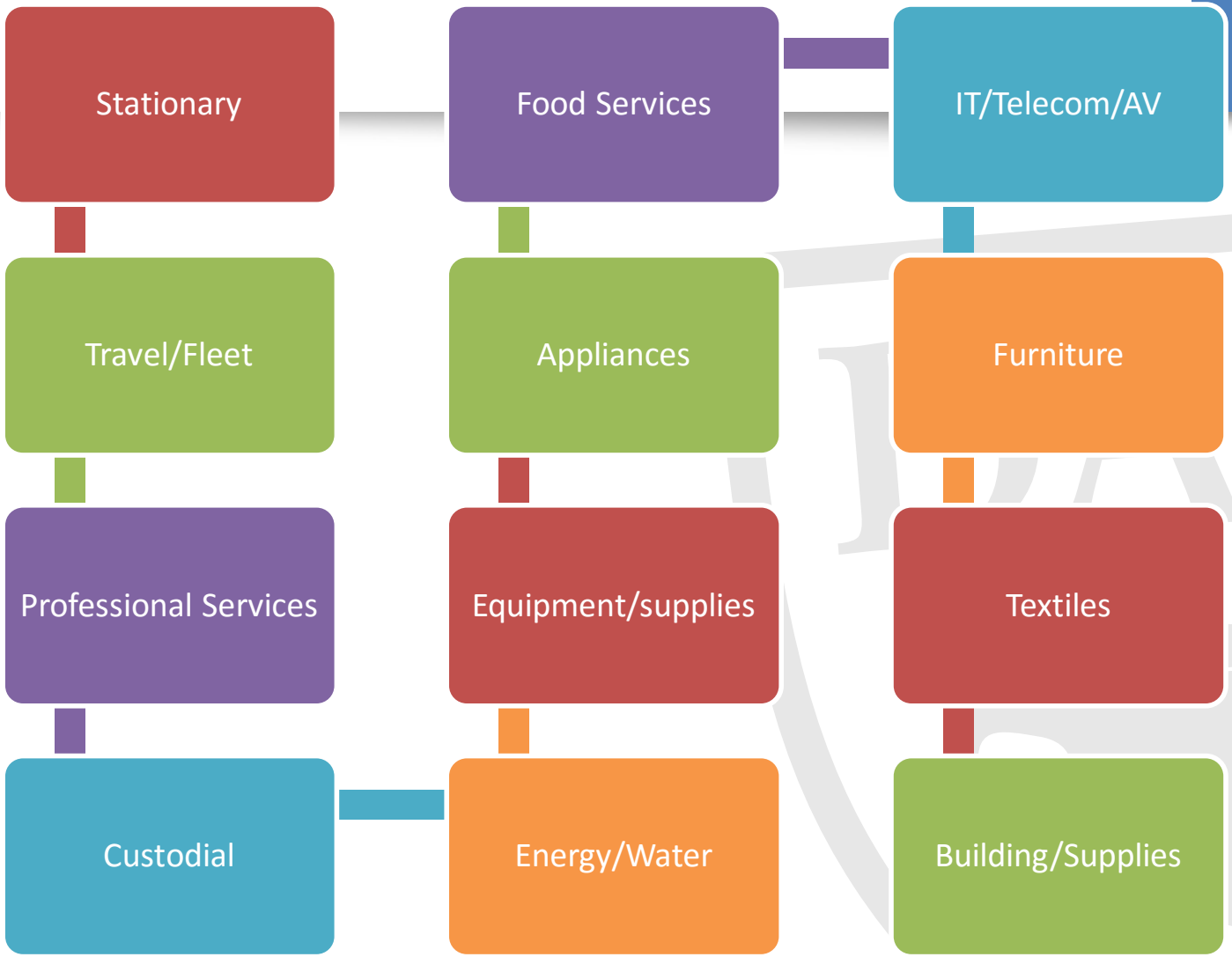
Common Commodities



Commodities

- Can be a number of items in commodity clusters
- Need to focus on some key ones
- Strategies focus on reduction, selection (avoid products that can't be composted/recycled), compliance/education ***(it is easier when small number of decision makers control the decision in a controlled environment)*** – cups in residence and cups at retail

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Reduce amount of commodities (waste efficiency)

- Reuse: ex. surplus goods, dump and run, support produce take back and reuse programs (lab chemicals)
- Sharing: ex. chemical stores (bulk dispensing), car share,
- Use Less of it: ex.
  - Paper (policy, MFD, computer software – double-sided)
  - Concentrated cleaners
  - Energy & Water Efficiency
  - Building Renovation/C&D labs-workshops, projects
  - **Food services packaging and food (catering/retail/events) residences** – trayless, weighing food waste, china, organics
  - **ITS – review of who needs workplace handheld device**

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Improve recycling and compost rates

- Reduce contamination
  - Waste Bin Standardization and Implementation (half way through); all outdoor bins re-stickered – pre and post audits
  - Clear bags
  - In-house pick-up and delivery to central warehouse- [more education, re-sort and compliance] We see it now.
  - Addressing illegal dumping – locked boxes, moving C&D bin and making it bigger and adding metal recycling
- Change products types – metal cutlery (first); if no go – wood instead of plastic as an example
- Adding new streams – EPS pilot continues – adding a few more options

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Special Collection Event
epra
Drop off your unwanted and end-of-life electronics
for safe and respo ible recycling FREE OF CHARGE.

Process for Developing Bin Standards (2010-2016)

1. Initial Bin ratio audits and waste audits (OS)
2. Development and Issue of standard for all spaces all campuses(OS – variety of versions – focus groups with different stakeholders) testing and revising
3. Bin Tender Created (Issued) (OS&FM)
4. Creation of Stores Sheet (OS)
5. All campuses space audits and reports (compares all spaces with standard), (OS)
6. Pre- bin waste audits in sample blds (OS&FM)
7. Custodial supervisor and staff training (OS)
8. Building Administrators Sessions and Prep (OS)
9. Communications
10. Bin Implementation/removal/repurposing (OS &FM)
11. Post-audits (OS &FM)
12. Maintenance (FM)

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Pilot Buildings

- Auditing history – 2008-2011 (online) – correlates to recent audits (2016)
- 10 blds – mix of types – residence and food services areas more contaminated
- Ranges of contamination:
  - Garbage: 45-80% (norm 60-70%)
  - Recyclables: 2-30% (norm 20%)
  - Paper: 0-30% (norm 10%)
  - Organics: 3-12% (norm 5%)
- Post testing have to wait until similar time period

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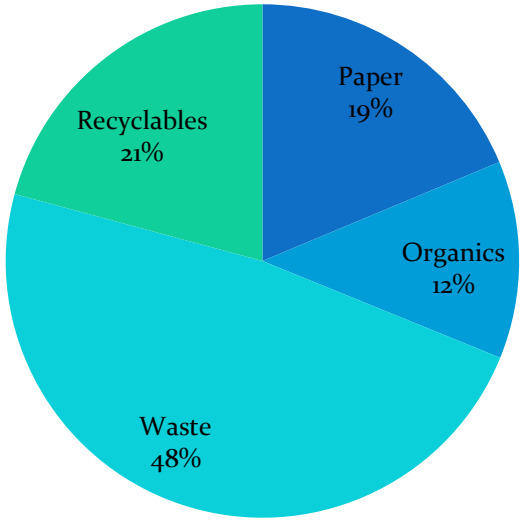
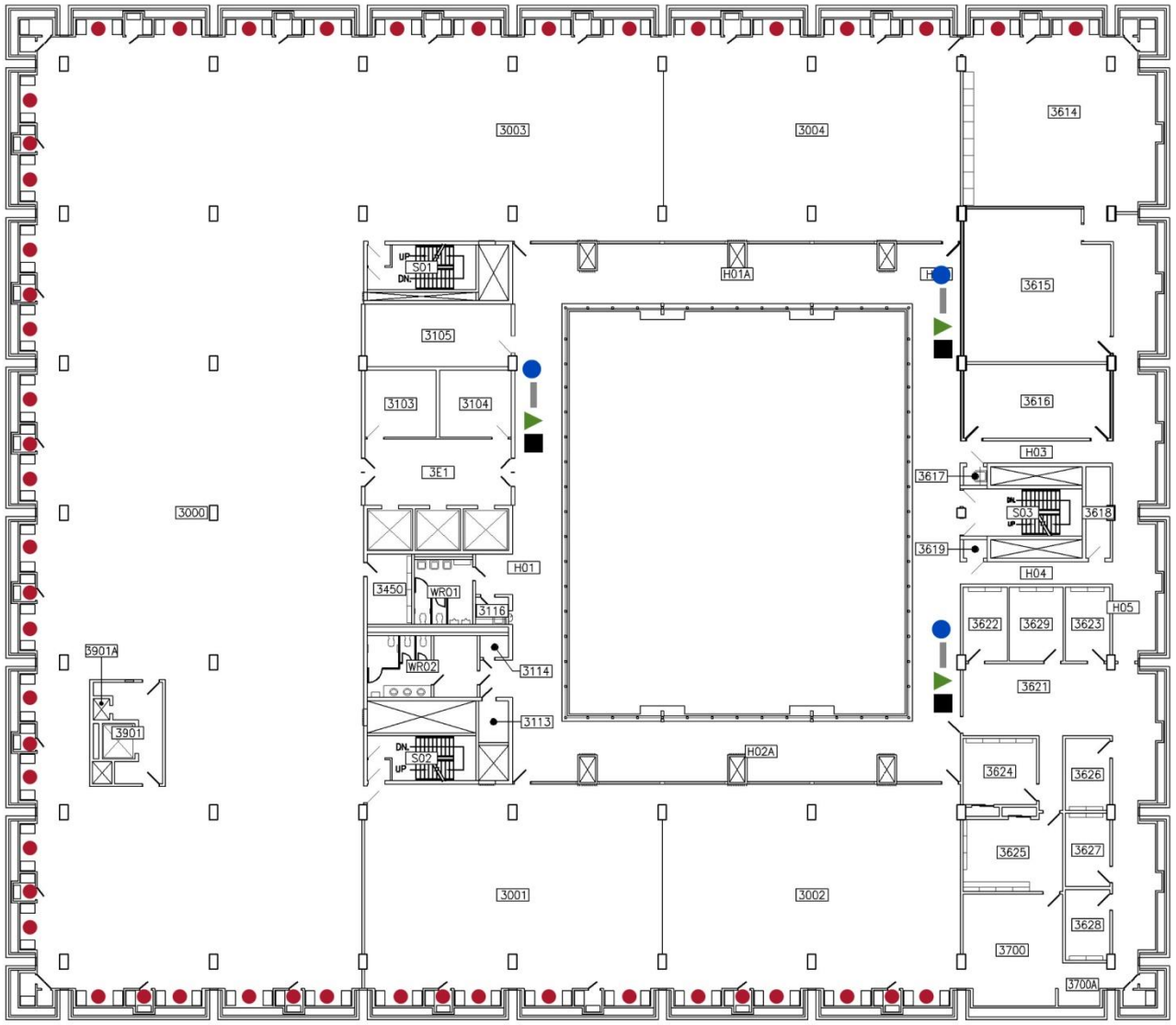
Results of Bin Ratio Audit

Overall Indoor Bin Ratio for Hallways (three campuses) – Before Recommendations



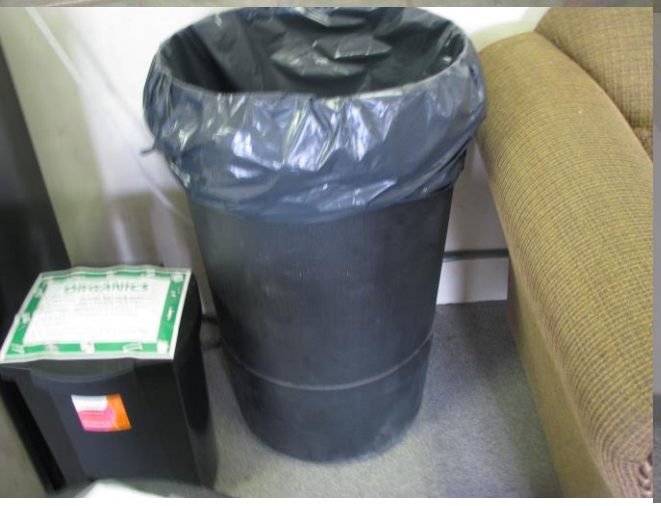
Paper	Organics	Waste	Recyclables	Totals
383	255	984	426	2048

Figure 2: Higher ratio of waste containers to recycling containers.



Waste Bins Separation Bins: Recycables, Paper, Organics, Garbage

Examples of Bins removed/upgraded



New Bin Standards

- Issued by FM and Office of Sustainability – covers twelve space types
- Objectives:
  1. reduce contamination (currently garbage streams are 40-70% contaminated): Overall total diversion rates are 60% diversion from landfill
  2. provide clarity on what goes where
  3. drive material to the Paper, Recyclable, Organics, and Garbage sets
  4. save garbage bags

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Objectives

5. meet municipal and provincial legislative, policy, and waste management plan requirements [Dalhousie has received bylaw enforcement tickets in the past]

6. be aligned with our reputational sustainability objectives. The Office has received recent emails from external stakeholders (Environment Canada) and the municipality about the lack of proper sorting and bins for composting in Dalhousie facilities

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Bin Standard Implementation

- Developed with guidance of stakeholders
- Compared to other universities
- Three summer research projects
- Presented to President's Advisory Council on Sustainability
- Strategic Initiatives Business Case and Approval(one-time funding) for process, bins, and signage
- Re-purposed existing bins

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Offices

- Replace separate garbage and recycling bins with transfer bins (picture below)
- Office employees/students responsible for sorting waste at Paper, Organics, Recyclable, Garbage stations which are serviced by facilities management
- No organics component to limit time of food in room
- A waste management – what goes where guide is in each bin

Bin Standard Implementation Briefing

Lunchrooms, Catered Spaces

- Four bin system (10-16 gallon)
- Also in LMP suites

Non-catered Classrooms, Meeting Rooms

- No waste bins
- Pack It Up, Pack It Out Sign
- Importance of hallway bins

Residence Rooms

- Small waste bin and recycling
- Paper bag maybe provide to support organics sorting
- Office staff/students responsible for sorting waste at hallway stations
- No organic bin component to limit time of food in rooms. Organics Bin provided in Suites.

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Hallway Stations

- Four bin systems (Paper, Recycling, Organics, Garbage) in hallways
- Goal of standard to promote funneling of waste to these bins

- Same design for auditoriums

Lunchrooms, Catered Spaces

- Four bin system (10-16 gallon)
- Also in LMP suites

Non-catered Classrooms, Meeting Rooms

- No waste bins
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- Importance of hallway bins

Residence Recycling Rooms

- (Usually) 32 gallon PROG bins (depends on volume)
- Also, refundables and broken glass bin (cardboard box with signage)

Commercial Kitchens

- No stand-alone garbage bins
- Organics bins at every work station
- Central recycling cart
- 16 gallon Paper and Recycling bins for stations as needed

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Dining Halls

- 32 gallon organics bin and 10 gallon garbage at dish-scraping stations
- 10 gallon garbage at serving station for peanut butter waste
- No bin lids needed

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Washrooms (Halifax & AC)

- 32 gallon garbage bin(s) in each washroom, size depends on volume (Halifax). HRM does not allow composting of washroom paper towel
- Compost and garbage bin at the AC in washrooms. Paper towel is allowed to be composted by the municipality.

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Laboratories

- Laboratories request specific bins in response to email sent from the OS
- Labs will receive weekly service from custodial and will be provided (if needed; depends on material in the labs) PROG sets from re-purposed bins on campus. PROG sets have Lab specific stickers.
- Labs can also receive a smaller bin to be used as a “transfer bin” if they need to empty bulky items like glass bottles during the week
- A lab health and safety protocol for preparing solid waste related lab containers is provided.

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Maintaining the Standard

- Bins should be in PROG order
- Proper stickers facing out
- Eye level signage above proper bin
- Contact your foreperson to provide bins and signage/stickers as required

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Additional signage developed

- Seven Construction and Demolition waste signs-stickers being implemented now
- Multi-lingual signage – to be piloted in key areas

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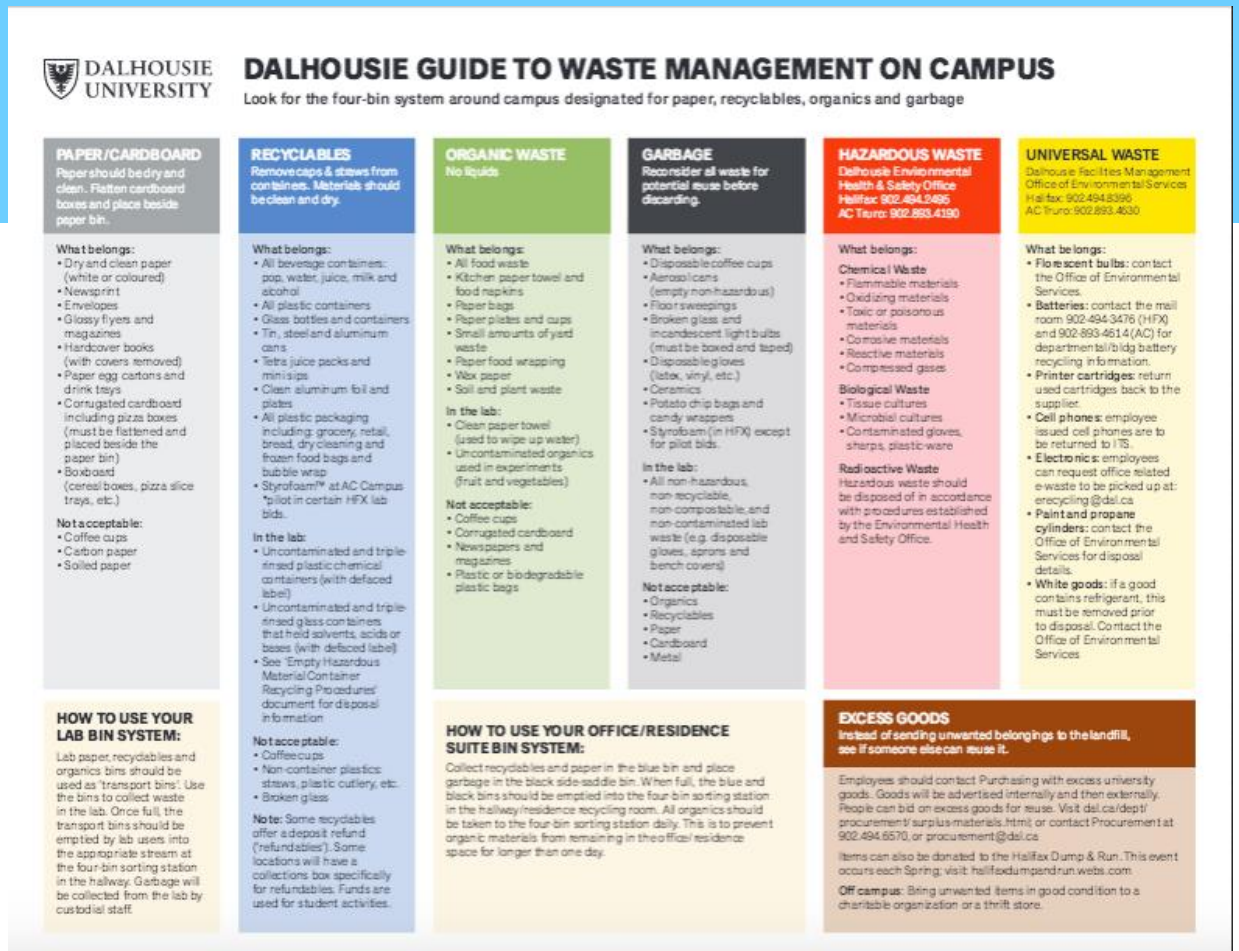
Understanding What Goes Where

- Basic bin signage provides a general guide
- ‘Complete’ list as Waste Management Guide



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DALHOUSIE GUIDE TO WASTE MANAGEMENT ON CAMPUS

Look for the four-bin system around campus designated for paper, recyclables, organics and garbage

PAPER/CARDBOARD

Paper should be dry and clean. Flatten cardboard boxes and place beside paper bin.

What belongs:
- Dry and clean paper (white or coloured)
- Newsprint
- Envelopes
- Glossy flyers and magazines
- Hardcover books (with covers removed)
- Paper egg cartons and drink trays
- Corrugated cardboard including pizza boxes (must be flattened and placed beside the paper bin)
- Boxboard (cereal boxes, pizza slice trays, etc.)

Not acceptable:
- Coffee cups
- Carbon paper
- Soiled paper

RECYCLABLES

Remove caps & straws from containers. Materials should be clean and dry.

What belongs:
- All beverage containers: pop, water, juice, milk and alcohol
- All plastic containers
- Glass bottles and containers
- Tin, steel and aluminum cans
- Tetra juice packs and mini sips
- Clean aluminum foil and plates
- All plastic packaging including: grocery, retail, bread, dry cleaning and frozen food bags and bubble wrap
- Styrofoam™ at AC Campus *pilot in certain HFX lab bids.

In the lab:
- Uncontaminated and triple-rinsed plastic chemical containers (with defaced label)
- Uncontaminated and triple-rinsed glass containers that held solvents, acids or bases (with defaced label)
- See ‘Empty Hazardous Material Container Recycling Procedures’ document for disposal information

Not acceptable:
- Coffee cups
- Non-container plastics: straws, plastic cutlery, etc.
- Broken glass

Note: Some recyclables offer a deposit refund (‘refundables’). Some locations will have a collections box specifically for refundables. Funds are used for student activities.

ORGANIC WASTE

No liquids

What belongs:
- All food waste
- Kitchen paper towel and food napkins
- Paper bags
- Paper plates and cups
- Small amounts of yard waste
- Paper food wrapping
- Wax paper
- Soil and plant waste

In the lab:
- Clean paper towel (used to wipe up water)
- Uncontaminated organics used in experiments (fruit and vegetables)

Not acceptable:
- Coffee cups
- Corrugated cardboard
- Newspapers and magazines
- Plastic or biodegradable plastic bags

GARBAGE

Reconsider all waste for potential reuse before discarding.

What belongs:
- Disposable coffee cups
- Aerosol cans (empty non-hazardous)
- Floor sweepings
- Broken glass and incandescent light bulbs (must be boxed and taped)
- Disposable gloves (latex, vinyl, etc.)
- Ceramics
- Potato chip bags and candy wrappers
- Styrofoam (in HFX) except for pilot bids.

In the lab:
- All non-hazardous, non-recyclable, non-compostable, and non-contaminated lab waste (e.g. disposable gloves, aprons and bench covers)

Not acceptable:
- Organics
- Recyclables
- Paper
- Cardboard
- Metal

HAZARDOUS WASTE

Dalhousie Environmental Health & Safety Office
Halifax: 902.494.2495
AC Truro: 902.893.4190

What belongs:

Chemical Waste
- Flammable materials
- Oxidizing materials
- Toxic or poisonous materials
- Corrosive materials
- Reactive materials
- Compressed gases

Biological Waste
- Tissue cultures
- Microbial cultures
- Contaminated gloves, sharps, plastic-ware

Radioactive Waste

Hazardous waste should be disposed of in accordance with procedures established by the Environmental Health and Safety Office.

UNIVERSAL WASTE

Dalhousie Facilities Management
Office of Environmental Services
Halifax: 902.494.8396
AC Truro: 902.893.4630

What belongs:
- **Florescent bulbs:** contact the Office of Environmental Services.
- **Batteries:** contact the mail room 902-494-3476 (HFX) and 902-893-4614 (AC) for departmental/bldg battery recycling information.
- **Printer cartridges:** return used cartridges back to the supplier.
- **Cell phones:** employee issued cell phones are to be returned to ITS.
- **Electronics:** employees can request office related e-waste to be picked up at: erecycling@dal.ca
- **Paint and propane cylinders:** contact the Office of Environmental Services for disposal details.
- **White goods:** if a good contains refrigerant, this must be removed prior to disposal. Contact the Office of Environmental Services

HOW TO USE YOUR LAB BIN SYSTEM:

Lab paper, recyclables and organics bins should be used as ‘transport bins’. Use the bins to collect waste in the lab. Once full, the transport bins should be emptied by lab users into the appropriate stream at the four-bin sorting station in the hallway. Garbage will be collected from the lab by custodial staff.

HOW TO USE YOUR OFFICE/RESIDENCE SUITE BIN SYSTEM:

Collect recyclables and paper in the blue bin and place garbage in the black side-saddle bin. When full, the blue and black bins should be emptied into the four-bin sorting station in the hallway/residence recycling room. All organics should be taken to the four-bin sorting station daily. This is to prevent organic materials from remaining in the office/residence space for longer than one day.

EXCESS GOODS

Instead of sending unwanted belongings to the landfill, see if someone else can reuse it.

Employees should contact Purchasing with excess university goods. Goods will be advertised internally and then externally. People can bid on excess goods for reuse. Visit dal.ca/dept/procurement/surplus-materials.html; or contact Procurement at 902.494.6570, or procurement@dal.ca

Items can also be donated to the Halifax Dump & Run. This event occurs each Spring; visit: halifaxdumpandrun.webs.com

Off campus: Bring unwanted items in good condition to a charitable organization or a thrift store.

FAQs

- **Are you taking the office garbage cans away? If so, what if our department paid for it? What are you going to do with them?**
  - Yes, the office garbage cans will be taken away and be repurposed for recycling and organics bins in other areas such as labs or recycled. The new recycling and side-saddle bins are provided free as part of this program to make the switch. Office waste is currently a highly contaminated stream. If a person used their personal finances to purchase a garbage bin then that is their property. This bin would not be serviced. If the department purchased extra recycling and organics bins to address volume needs then this will remain and will continued to be serviced. Facilities Management will be servicing more four-bin stations under this change.
- **Is this Office standard unique to Dalhousie?**
  - No, other organizations including local universities have made the switch to similar standards to help reduce contamination and meet waste management by-laws and provincial bans. The office standard has been adopted by departments like Facilities Management and has been implemented in new buildings since 2011. The full implementation will standardize the spaces across all campuses.
- **Are you going to be doing more waste education sessions on what goes where?**
  - Yes, upcoming webinars and promotions will be planned and the waste management guide posted at: http://www.dal.ca/dept/sustainability/resources/Reports_and_Policies.html - is kept up-to-date. Contact Facilities Management for any specific questions about composting, recycling, and waste management.

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Implementation

- Two smaller campuses – OS and FM teams over a period of a month
- Repurpose bins for Lab sets – separate communication to Labs
- Large campuses: Reading Week: The Big Switch (another ppt☺): Six teams: coordinated logistical effort – Four days. Involve 30-40 people

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Preliminary results

- Ratio of bins will be one-to-one except in particular spaces (labs where standard is implemented based on material and need)
- Less contamination and positive feedback
- More education requested Post audits will happen soon – we had to wait until a replicable time period

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Metrics

- Testimonials from employees and students
- Bag number reductions before and after (removing single bins, changing office bin, residence rooms)
- Contamination rates – %, tonnage, costs (haulage fees, tip fees)
- Promotion for bookings
- Reduced compliance notices / complaints

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Overall Plan

- The university has a solid waste management plan. Bin standards implementation is one of the many projects highlighted in the plan. Other key projects include:
  - Catering, residence, and food service education and compliance programs
  - Elimination of waste dumpsters, controlling volumes and compacting at the warehouse
  - Better tracking of weights by stream by vendors and Facilities. Tracking through FAMIS and Tableau reporting
  - Enhance construction and demolition diversion
  - Ongoing research
  - **Since 2010, every year, the Office of Sustainability has had been successful in receiving student waste research grants. Many students from different faculties have participated in waste audits.*

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Key Takeaways

- Prepare Business case: Bin Ratio analysis, audits, bag numbers (costs saved, reputation, compliance, stewardship)
- Build on the work of others: feel free to adapt and build on this work. Creating a standard is also an important communication and roles document
- Start with a pilot

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