Resource Sharing Users Group

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Greening ILL Practices: Data's, Do's and Don't's

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Boston, MA

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Bring on the Experts

- California Environmental Associates
  - ***www.ceaconsulting.com***
- 3-month study
- Goal: reduce carbon footprint of entire resource sharing system
- Emphasis on affordability
- Inspired by Karen Bucky, Clark Art Institute, SEG
- Funded by OCLC Research and OCLC Delivery Services

Assignment: Green

- **CEA's task:** CEA was engaged to measure the environmental impacts associated with ILL lending processes and recommend improvement options
- **Methodology:**
  - Interviewed 12 representative research, art and public libraries within the OCLC system to identify best practices
  - Interviewed shipping, packaging, and library experts
  - Toured a large academic library and business school library to understand lending processes
  - Collected data from 10 libraries on consortia arrangements, shipping methods and guidelines, and packaging material composition and sourcing
  - Determined per book-mile greenhouse gas emissions and associated impacts from packaging, shipping, and paper use for 4 lending institutions
  - Recommended improvement options

As we already know, ILL'ers rock

- **Libraries are already doing a lot to be green**:
  - Reusing packaging materials
  - Bundling outgoing shipments
  - Sourcing books from local institutions

- **The biggest opportunity** to improve the environmental profile of the ILL system is for libraries across the system to adopt the best practices in packaging and shipping practiced by surveyed libraries

- **The ILL Greening Toolkit** will contain lists of these best practices.

Environmental impacts: contributing factors

Key factors that contribute to the impacts from packaging, shipping, waste, and paper use:

Packaging

- container material type
- padding type
- weight
- volume
- recycled-content
- recyclability
- durability

Shipping

- mode of transport
- vehicle type
- distance traveled
- load optimization

Office paper use

- efficient use
- recycled content
- supply chain certification

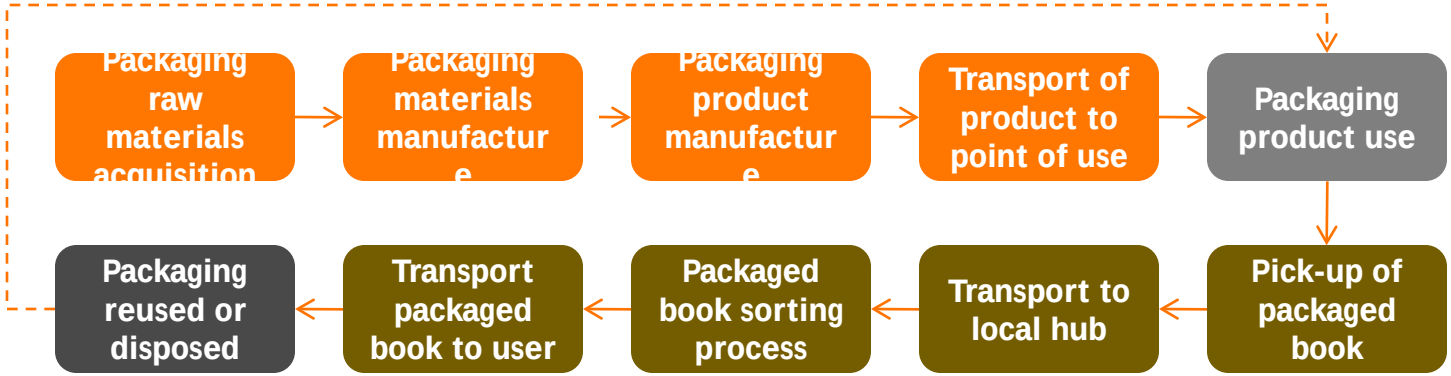
Waste

- type of waste
- volume
- weight
- recyclability

Environmental impacts: packaging, shipping, waste

Environmental impacts from ILL material distribution logistics have 3 major components:

1. **Packaging material production** (**51%** of total GHG emissions per package)
2. **Shipping operations** (**48%** of GHG emissions per package)
3. **Waste disposal** (**1%** of GHG emissions per package)



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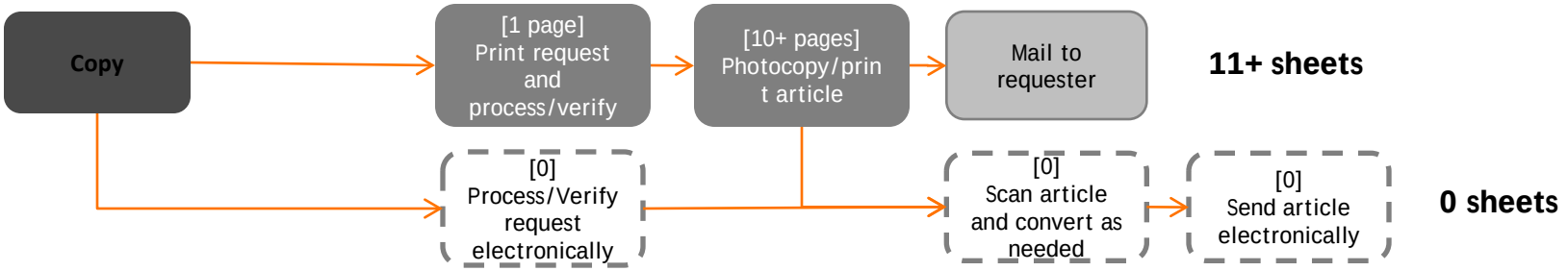
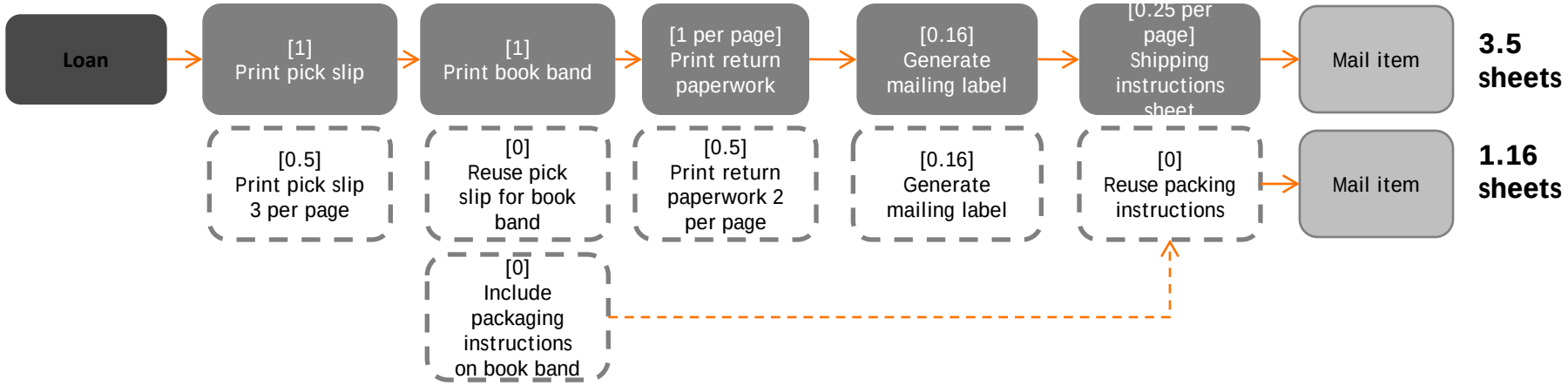
Source: Franklin Associates, 2004. Life Cycle Inventory of Packaging Options for Shipment of Retail Mail-Order Soft Goods and internal CEA analysis. See back-up slide 34 for detail on GHG emissions breakdown for packaging, shipping, and waste.

Environmental impacts: office paper use



Lending Paper Flow: Copy



Lending Paper Flow: Loan

Environmental impacts: office paper use

Paper facts

By reducing loan paperwork from 3.5 to 1.16 pieces of paper, a mid-size library with a volume of 10,000 loans per year would reduce paper use by 234 lbs per year, and

- Save 3 million BTUs of energy
- Stop 688 lbs CO_2e from being emitted
- Reduce 2,600 gallons of wastewater
- Prevent the creation of 223 lbs of solid waste

By reducing article paper use from 11 (or more) to 0 pieces of paper, a mid-size library with a volume of 5,000 requests would reduce paper use by 550 lbs per year, and

- Eliminate about 1 ton of wood use or 7 trees
- Save 8 million BTUs of energy
- Stop 1,618 lbs CO_2e from being emitted
- Reduce 6,110 gallons of wastewater
- Prevent the creation of 525 lbs of solid waste

Best Practice: One university's ILL staff saves paper and staff time using a unique loan request template that doubles as a pick slip and return paperwork. They print it on special sheets that are half label, half copy paper, so outgoing and incoming mailing labels are also printed in one step, using only one piece of paper total.

Source: Environmental impact estimates were made using the Environmental Defense Fund Paper Calculator. For more information visit http://www.papercalculator.org

Environmental impact analysis – Overview

Institution	University A	Art Museum Library	University B	University C
Loan volume (returnables)	10,143	471	2,714	34,559
Book Miles Traveled (000s)	12,118	671	6,069	33,864
Total Emissions (lb CO_2e)	4,306	377	3,880	31,731
Shipping Emissions (lb CO_2)	4,129	329	2,768	17,983
Packaging Emissions (lb CO_2e*)	176	48	1,112	13,748

- **24,000 lb CO_2**: Emissions from the energy use of a single family home in one year
- **11,013 lb CO_2**: Emissions from the average car
- **196 lb CO_2**: Emissions from a ten gallon tank of gasoline

Note: This analysis covers the roundtrip impact of ILL lending operations at each institution. Borrowing was excluded from this calculation to avoid double-counting of emissions. Shipping and some packaging impacts would be considered within an organization's Scope 3 emissions.

*Packaging impacts are calculated in carbon dioxide equivalents (CO_2e), incorporating the impacts of methane and nitrous oxide (greenhouse gases significant in the production of packaging materials); CO_2e information was not available for the shipping impact calculation, therefore CO_2 impacts alone were calculated.

Observations: Packaging

Institution	University A	Art Museum Library	University B	University C
Packaging Emissions (lbs CO_2e)	**176**	**48**	**1,112**	**13,748**
Packaging Emissions (lbs CO_2e per 100 books)	2	10	41	40
Packaging % of total emissions	4%	13%	29%	43%

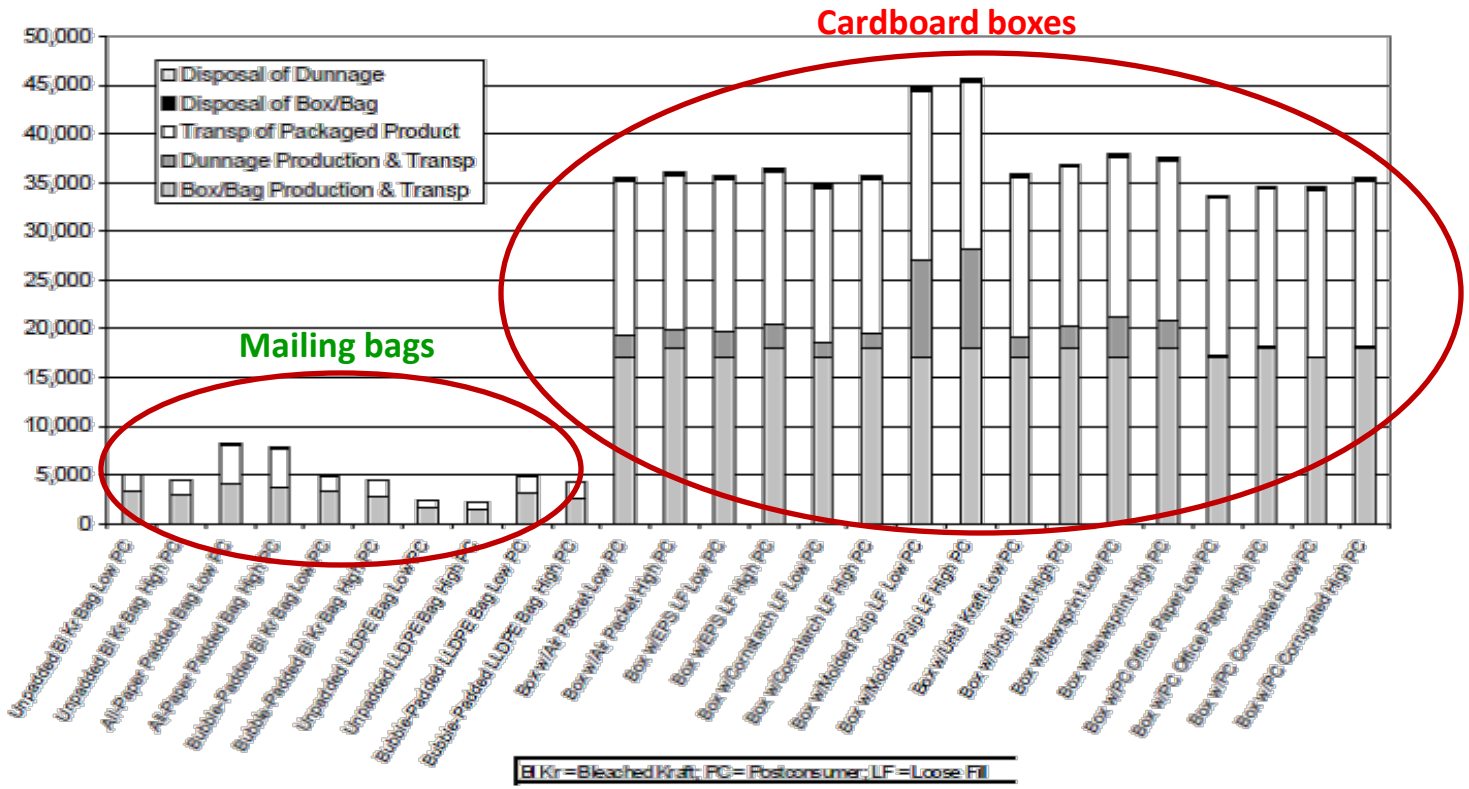
- **Reusing materials is key.** University B and University C have highest packaging per book emissions because both use new boxes to ship all materials.
- **Reusable courier bags and bins help to reduce packaging emissions.** The Art Museum's per book mile emissions are higher than University A's because the Art Museum is not a member of a regional resource-sharing consortium, while University A's local courier provides reusable packaging.
- **For new materials, choose less energy intensive products.** University A, which has the lowers per book mile emissions, reuses a large quantity of packaging materials, especially boxes. For new materials, it purchases jiffy mailers which require less energy to produce than boxes.

Emissions intensity of packaging choices

The table below shows the greenhouse gas emissions resulting from the production, transport, and disposal of various different types of packaging. Note that the **mailing bags** (on the left) **generate significantly fewer emissions than the cardboard boxes** (on the right)**.**

Source: Franklin Associates, 2004. Life Cycle Inventory of Packaging Options for Shipment of Retail Mail-Order Soft Goods.

Figure ES-5. Total Greenhouse Gas Emissions for 10,000 Packages
(pounds CO2 equivalents/10,000 packages)



Observations: Shipping

Institution	University A	Art Museum Library	University B	University C
Shipping Emissions (lbs CO_2)	4,129	329	2,768	17,983
Shipping Emissions (lbs CO_2 per 100 Book-Miles*)	0.034	0.049	0.046	0.053
Shipping % of total emissions	96%	87%	71%	57%

- **Aggregate materials to minimize shipments.** The Art Museum and University B primarily use boxes to ship loans; however, the Museum's per book-mile shipping emissions are higher because it aggregates shipments less frequently than University B (due to the Museum's smaller volume of loans).
- **Minimize package size.** University A has the lowest ground shipping emissions. It uses 60% bags to ship materials, compared to other libraries that use primarily boxes. Bags take up less space on the truck and can therefore help reduce carbon emissions and shipping costs.
- **Packaging size matters for courier shipments as well.** Totes occupy approximately 4.5 times as much space as nylon bags. For example, University A's courier uses nylon bags while C's uses totes.
- **Ground transportation produces fewer emissions that air.** Even though University A ships nearly 3 times fewer book-miles by air than by courier, its emissions from air shipping are nearly 3 times higher.

*This represents the emissions from moving 100 books 1 mile, or moving 1 book 100 miles.

Implications

What the data tells us…

Packaging impacts will be minimized by:

- Reusing packaging materials (cuts footprint nearly in half!)
- Joining local consortia that use reusable totes and nylon or canvas bags that require no additional packaging
- Promoting reusability by using durable materials and handling them carefully will help others reduce their footprints

Shipping impacts will be minimized by:

- Using the smallest size packaging possible (right-sizing to loan materials)
- Sourcing books/materials from the nearest lenders
- Aggregating shipments (loans and returns) to same destination
- Using a low-impact mode of transportation (ground, not air)
- Choosing fuel-efficient vehicles

Barriers to greening

Cost barriers:

- Cost of greener (durable, recyclable, compostable) packaging materials limits their use
- Cost of overhead scanners limits ability to send articles electronically without printing
- Cost of recycled-content paper limits its use

Operational barriers:

- While return items are not time-sensitive and may be held and then bundled with loan items, loan items must be sent immediately, limiting their aggregation and requiring more shipments
- Fragile items require additional padding
- Lack of communication between mailroom and library makes reuse of packaging difficult
- Lack of storage space for used packaging materials discourages reuse
- The time it takes to preserve and reuse old packaging materials may outweigh the avoided costs of new packaging materials

Systematic barriers:

- Licensing agreements require that articles be printed prior to scanning electronically, resulting in unnecessary paper use
- Lack of system for sharing best practices
- Lack of incentives to improve environmental friendliness of activities

Recommendations

1. **Implement the current best practices** of libraries surveyed
2. C**ommunicate**: set-up portal / listserv for sharing greening and best practice information
3. **Consider launching a purchasing consortium** to lower costs of packaging materials, office copy paper, and overhead scanners
4. **Team together to influence** 1) article subscription licensing agreements to allow e-sending without printing/rescanning, and 2) UPS/FedEx to use hybrid vehicles for shipments 3) courier services to implement logistics best practices

ILL Greening Toolkit

ILL Best Practices Observed

- Packaging
- Shipping
- Office Paper Use

Greening Checklist for Library Workplace

- Reduce solid waste and recycle
- Conserve energy
- Conserve water
- Pollution prevention

Additional Resources

- Comparison of Shipping Systems
- List of additional resources

Best practices observed: packaging (I)

GOAL: Reuse packaging materials, minimize their size and weight, and utilize materials with maximum post-consumer recycled content.

1. Reuse materials:

- Sort materials that are received into “reuse”, “recycle”, and “trash” bins
- Collect used boxes and shipping materials from staff and other departments at the university (not just the library) for reuse

2. Procure materials that are durable, contain recycled content, and are recyclable:

- If it becomes necessary to purchase new materials, try to source materials that are durable, contain recycled-content, and are recyclable
- Cardboard mailers (e.g. U-Line Easy Fold) are recommended because they are durable, can be reused several times, contain 20-30% recycled content, and can be folded to the size of the item which reduces the volume of the package and the need for additional padding material

Best practices observed: packaging (II)

3. Recycle materials at end of life:

- If material can no longer be reused, recycle whenever possible

4. Other innovative practices:

- If mailroom is separate from the library, ensure that there is communication so that library materials received can be reused by the mailroom in outgoing shipments
- If bundling books for shipments in bins/totes, use rubber bands rather than additional packaging
- If eliminating paper files from automating workflow, use freed-up space to store packaging materials
- Participate in a local delivery consortia; they are often cheaper, reduce book miles traveled, and do not require packaging other than a canvas bag or a paper routing slip rubber-banded to the books and dropped in reusable totes [Emory]

5. Practices to avoid:

- Avoid Styrofoam peanuts; they are not recyclable.
- Do not staple or rip open paper jiffy bags (they explode and can't be reused)

Best practices observed: office paper use (I)

GOAL: Reduce, reuse, recycle, and procure sustainably

1. Minimize use of paper

- Verify availability of lending materials before printing any pick slips
- If borrowers do not use Ariel or Odyssey, send articles by email or temporary URL.
- When printing pick slips, book bands, and mailing labels, fit multiple to a page
- Press publishers and vendors to allow sending articles from e-journals without printing first
- Save microfilm/microfiche images to USB drives rather than printing
- Engage an ILL mentor to help maximize use of workflow automation tools

Best practices observed: office paper use (II)

2. Reuse paper

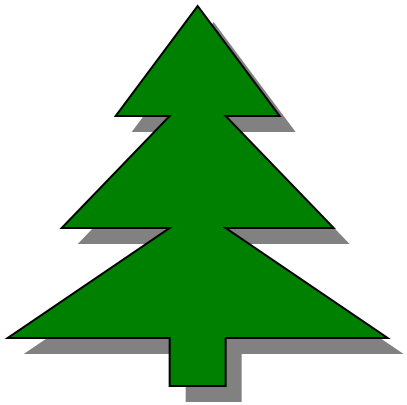
- Make photocopies on the back sides of scratch paper
- Reuse back side of scratch paper for notes (cut sheets in halves or quarters)
- Reuse pick slip as mailing record, book band, or return paperwork

3. Procure paper from sustainable sources

- Maximize recycled content of paper purchased (30% post-consumer recycled content is often cost-neutral)
- Purchase FSC-certified paper when possible

Recommendations in a Nutshell

- Re-use > New
- Mailers > Boxes
- Ground > Air
- Near > Far
- Local courier > FedEx/UPS
- Aggregate > 1X1
- Nylon bags > plastic bins
- 30% recycled = new ($-wise)



The Sharing of the Green

- Presentations like this
- Webinar in winter/spring
- Formal report before summer

- Greening ILL Toolkit on OCLC Web site
  - Greening check list
  - Best practices
  - Resources

- Keeping the conversation going: ILL-L, blog