

A Model Waste Prevention Program



Legacy Health System

May 1994

Legacy Health System is an Oregon not-for-profit health care system which includes Emanuel Hospital & Health Center, Good Samaritan Health & Medical Center, Holladay Park Medical Center, Meridian Park Hospital, Mount Hood Medical Center, Legacy Visiting Nurse Association, and Caremark/Managed Health Care Northwest PPO. Legacy's three Portland hospitals include Legacy Good Samaritan (341 beds), Legacy Emanuel (385 beds), and Legacy Holladay Park, which will be closing in June.

Recognizing that the best solution to the solid waste problem is not to make waste in the first place, Legacy's Portland hospitals have implemented a number of measures that successfully prevent waste at the source. More efficient use of materials means there is less material to be recycled or disposed of. In the pages that follow, Legacy shares 14 specific things they've done to make less waste. These efforts save the company more than \$279,000 and prevent more than 67,000 pounds of waste each year.

Many of the waste prevention activities are not specific to the health care industry, and can be applied to any business. Examples include:

- Using supplies and materials more efficiently.
- Eliminating unnecessary items.
- Using durable and reusable products.
- Reducing packaging.

In addition to preventing waste, Legacy's two Portland hospitals employ a full-time recycling specialist who supervises a program which collects cardboard, office paper, glass bottles and metal cans, and six different resins of plastic. In 1993, the program recycled over one million pounds of material—approximately 25% of the Portland hospitals' waste.

Legacy invites other businesses to learn about its efforts and to implement recycling *and* waste prevention programs of their own.

Prevent waste , then recycle 

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Acknowledgments

These programs were implemented by the employees of Legacy's Portland hospitals. Assistance in documenting the waste diversion and cost savings of specific waste prevention efforts came from John McAllister, Legacy's Portland hospitals' Recycling Specialist, and David Allaway, project manager at Harding Lawson Associates, a consulting solid waste engineering firm. This program was funded by a Metro "1 Percent for Recycling" grant. The waste prevention logo was developed by the Minnesota Office of Waste Management. Special thanks go to:

Monte Wagner, Materials Management
Gini Holbrook, Materials Management
Jeanie Schuldt, Materials Management
Nancy Gundersen, Materials Management
Martin Miller, Materials Service Center
Pauline Svestka, Surgery Department
Russ Sipe, Western Paper
Marcel Leuenberger, Food and Nutrition
Lee White, Information Resources
Cathy Sharpe, Maternity

Gary Ellison, Housekeeping
William B. Krieg III, Baxter Healthcare Corporation
Brenda Quint-Gable, Visiting Nurses Administration
Diane Dinowsky-Smith, Public Relations
Barbara Manghelli, Devers Memorial Eye Clinic
Carolyn Ryan, Patient Accounts
Joel Krane, Receivable Control Systems
Cindy Hill, Pediatrics

Printed on recycled paper.

Replace disposable foam mattresses with reusables

Three years ago, Legacy Good Samaritan purchased several hundred permanent, waterproof mattresses to replace the disposable egg crate foam mattress. The initial purchase was substantial but the decision paid for itself in just over one year.

The purchase of the egg crates has been reduced by 96%. It is still necessary to have a few in stock for some situations, and these are either taken home by patients or recycled.

Total waste prevented:	16,350 pounds ¹ 757 cubic yards, or 25 30-yard open drop boxes.
Percent of waste prevented:	96%
Purchasing savings:	\$80,710 ²
Disposal savings:	\$817 ³
Net Savings:	\$81,527

Purchase supplies in bulk, lightweight packaging

In the mini kitchens on each nursing unit in the hospitals there are refrigerators stocked with beverages for the patients. Rather than providing single serving containers, the beverages come in a variety of bulk packages. For instance, each unit has a soda fountain rather than individual cans.

A year ago, the Food and Nutrition department at Legacy Good Samaritan switched from buying juice in a 32-oz glass container to a 60-oz plastic container that the hospital recycles. There are two important results from this switch. First, fewer containers are being purchased. Second, the new, larger containers are one-quarter the weight of the old, smaller container.

Food and Nutrition purchases over 1,500 60-oz bottles of beverages per year. Previously, they were buying almost 2,900 32-oz bottles. The difference in disposal would be over 2,500 pounds per year. However, both of these products are recycled at a very high recovery rate, so the major benefit is the reduction of 2,500 pounds of materials and the almost 1,400 fewer units being purchased.

Total waste prevented:	2,500 pounds
Net Savings:	\$125

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1. 16,350 pounds is based on the number of mattresses purchased by Good Samaritan in the last year before the permanent mattresses were bought.
 2. Annualized savings based on avoided cost of egg crate mattresses minus annualized cost of permanent mattresses.
 3. Disposal fees are 5¢ per pound.



Eliminate unused Items from custom packs

“Custom packs” are sterile packages of supplies which are purchased by hospitals for procedures where a standard set of supplies are consistently used. Without a custom pack, all of the supplies have to be assembled by surgical staff before the surgery. A custom pack allows staff to use an “off-the-shelf” package, which can be supplemented with extra, individual items as needed.

Since all of the contents of a custom pack are sterilized together, less individual packaging may be used. Thus, at first glance, custom packs are preferable from a waste reduction perspective. However, once a custom pack is opened, all of the contents lose their sterility. Many hospitals discard the unused items.

Some hospitals use custom packs extensively, while others are sparing in their purchase of custom packs, believing them to be more expensive. Regardless, hospitals using custom packs should be careful to make sure that their packs don’t contain items that are regularly thrown away, unused.

Beginning in 1993, Legacy formed several committees to review the contents of its custom packs. Surgery and Purchasing staff from the five Legacy hospitals worked together to identify those items which are not used regularly enough to justify inclusion in the various packs. The result is cost savings and fewer supplies thrown away.

Total waste prevented’ : more than 11,000 pounds/year²
Percent of waste prevented: 25%

Net savings: more than \$30,410/year³

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1. This analysis is for four custom packs only: Birthing Room, Orthopedic, Major Laparotomy, and Minor Laparotomy. These were selected as being representative packs. Legacy Emanuel uses all four of these packs, but Legacy Good Samaritan uses only one. Overall, Emanuel uses approximately 30 different packs in its operating room; Good Samaritan uses about 5. Thus, the total waste prevention and cost savings for the overall effort is substantially higher than estimated here.
 2. The two hospitals used approximately 6,000 of these four packs in 1993. The vendor of these custom packs provided total pack weight [products and packaging] for each pack before and after revision. 25% of the difference was added back into the weight of the post-revision waste as an estimate of waste created by occasionally using items no longer in the pack.
 3. The prices of these custom packs are confidential. Legacy Health System estimated unit savings for each pack based upon an analysis of pack prices and estimates of added supply costs under both scenarios (before and after). This cost also includes avoided disposal cost, estimated at \$0.05/pound.



Consolidate duplicative admitting kits

Each patient who checks into a hospital room receives a patient admit kit which contains items such as a wash basin, soap, a cup, a pitcher, etc. The Wilcox Women's Pavilion (Maternity Department) at Legacy Good Samaritan put a halt to handing these kits out because they also gave their pregnant patients a maternity kit. These kits are basically the same thing with a few more items.

Total waste prevented:	2,704 pounds/year
Percent of waste prevented:	100%
Net savings:	\$3,547



Switch to less wasteful product

Legacy Health System recently switched from a paper/plastic blend disposable coffee cup to an all-plastic, recyclable cup. The previous cup was hot to the hand and many cafeteria patrons took two cups so they could comfortably hold the cup. The new cup is insulated and only one is necessary. Hospital employees are also encouraged to use their own mugs. In doing so, they receive a discount in the cafeteria.

Before the switch, Legacy Good Samaritan and Legacy Emanuel were throwing away over 42,500 pounds of cups at a cost of \$2,125 per year. The new cups are two-thirds lighter and are recyclable. The use of fewer cups, through improved insulation and the increase in employees using their own mugs in the cafeteria, along with recycling, will improve the savings even more.

Total waste prevented:	28,333 pounds/year ¹
Percent of waste prevented:	67% ²
Purchasing savings:	\$24,300/year ³
Disposal savings:	\$1417/year ⁴
Net savings:	\$25,717/year

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1. It was assumed that Legacy would have bought the same number of paper/plastic cups as it did the all-plastic cups, and that the new product is two-thirds lighter. Additionally, the plastic cups are recycled at a rate of 17% (based on information gathered in the first two months of the program); the recycling rate is not included in the numbers above.
 2. Plastic cups weigh two-thirds less than paper. It is too early to determine reduction in the use of cups.
 3. Savings based on purchases made in the first two months of program compared to the same months one year previous.
 4. Disposal fees are 5¢ per pound.



Replace disposable batteries with rechargeables in beepers

Hospitals use disposable batteries in a variety of equipment. Mercury, cadmium, and other heavy metals from these batteries, if allowed to escape into groundwater or air (from incineration), pose a very real threat to the environment and human health. In the past several years, the amount of mercury in certain brands of disposable batteries has decreased significantly.

One alternative to disposable batteries is rechargeables. Although beepers represent a small fraction of Legacy’s battery use, they were selected to test rechargeable nickel-cadmium batteries (“NiCads”) in Legacy Good Samaritan’s Housekeeping Department. NiCads require several charges and discharges before reaching their maximum capacity. Rechargeable batteries and a recharger were purchased, and tested against disposables. Beepers with NiCads and disposables were called twenty times each in each 8-hour day. The NiCads required an initial charge and then two follow-up charges in their first month. But by the time of their third charge, the NiCads lasted 25 8-hour days, receiving 20 calls a day.

Manufacturers’ claims are that NiCads can be recharged hundreds of times. Full recharging takes approximately eight hours; the Housekeeping Department keeps four extra batteries on hand, so that recharging is never a problem. The company from which these NiCads were purchased offers a life-time guarantee, and will recycle the NiCads should they ever wear out.

The decision to use rechargeable rather than disposable batteries must be carefully thought out on a case-by-case basis. Care must be taken to keep disposable batteries out of recharging units (they may explode or leak), and to make sure that rechargeable batteries, some of which contain high levels of cadmium, are not accidentally disposed of. However, if rechargeables are used properly, and they replace disposable batteries with high levels of mercury, they can help to make businesses’ garbage much less toxic.

Waste prevented:	N/A
Percent of waste prevented:	100% ¹
Cost:	\$53.50/5 years ²
Cost savings:	\$154.50/5 years ³
Net savings:	\$20.20/year

1. Assuming that no rechargeables are accidentally disposed of.
2. For 14 AA batteries (ten plus four extras) and one recharger. Electrical costs to recharge batteries are nominal.
3. For 200 disposable batteries (10 beepers, requiring new batteries every three months).

Encourage double-sided copying

Legacy's Materials Management Department is requiring all new photocopiers to have automatic duplexing capacity, which will make it easier for employees to copy on both sides of the page. Automatic duplexing is a standard feature of high-end machines; adding it to a low-end machine may increase the price as much as 15%. However, Legacy Good Samaritan, which has 80 photocopiers, spent approximately \$37,000 in 1993 for 8.5" X 11" copy paper alone, so the potential savings is large.

Additionally, Legacy's Recycling Specialist regularly provides in-service training at department staff meetings. At these training meetings, employees are encouraged to use the duplexing option on their photocopiers. Posters promoting double-sided copying have also been placed over most photocopiers. An effort was made in three departments to estimate the effectiveness of this education, but with paper being moved between copiers and printers, the results were inconclusive.

Reduce photocopies by keeping originals on file (example: Patient Accounts)

The Patient Accounts department of Legacy Good Samaritan receives payments from insurance companies in the form of vouchers. These vouchers may be up to 100 pages in length.

Historically, Patient Accounts made two or three copies of each voucher, so that several billing representatives could work with it simultaneously. Realizing the waste of time and paper spent making these copies, billing representatives agreed to keep the originals on file and not to make copies. Staff borrow the originals for short periods of time to work with them, and try to return them to the file promptly after use. Occasionally a voucher takes longer than necessary to return to the file, but this hasn't caused the department significant problems.

Total waste prevented:	900 pounds/year ¹ 0.75 cubic yards/year ²
Purchasing savings:	\$428/year
Disposal savings:	\$45/year
Net savings:	\$473/year ³

1. Staff estimate that paper savings are approximately 15 reams/month. One ream weighs 5 pounds.

2. One ream of paper measures 8 1/2 inches wide, 11 inches long, and 2 inches high.

3. This does not include labor savings from no longer having to copy the vouchers.



Reduce photocopies by keeping originals on file (example: Visiting Nurse Association)

The Visiting Nurse Association determined that much of the photocopying they did was unnecessary. A team of workers analyzed the process and the flow of paper, and asked employees and customers how they used the copies that were generated. Before the study, seven copies of each admitting record were printed and distributed. The group determined that typically fewer than 50% of the copies were needed.

A new policy was drafted which states that only one version is printed and it is copied on an “as needed,” basis. For pending files, the information is now accessed on the computer, or referred to in the file, rather than printed out.

The savings came in many different areas. Clerical, staff, and management time savings amount to \$10,040 per month. The other savings include toner cartridges, envelopes and paper purchased (\$157/month) and postage (\$350/month), since the number of items mailed out per month has been cut by 1,200.

The Visiting Nurses were also able to reduce the number of forms that they use by eliminating some forms and combining others. In printing charges, this saved another \$100/month.

Waste prevented:	1200 pounds/year ¹ .96 cubic yards/year
Percent of waste prevented:	50% ²
Gross savings:	\$127,764/year ³
Disposal savings:	\$60/year ⁴
Net savings:	\$127,824/year

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1. 1200 pounds/year represents 10,000 sheets of paper saved each month (VNA estimate). 10,000 sheets = 100 pounds.
 2. VNA staff has determined that they make 50% fewer copies.
 3. Savings include staff time and cost of supplies.
 4. Disposal fees are 5¢/pound.

Customize the distribution of reports (example: new accounts)

Computers have improved Legacy's ability to closely monitor supplies, utilization, and accounting. For example, Receivable Control Systems (RCS), an office of the Finance Division, prepares monthly lists of new accounts for all of Legacy's different hospitals. As Legacy has grown, different hospitals have requested customized reports.

Traditionally, as the number of different kinds of reports grew, RCS provided each hospital with one of each. Recognizing that not all of the hospitals wanted all of the different reports, however, RCS later customized a report distribution list for each hospital. RCS staff estimate that this has reduced the printing and distribution of this one set of reports by 40%.

Total waste prevented:	576 pounds/year ¹ 0.48 cubic yards/year ²
Percent of waste prevented:	40%
Net savings:	\$224/year ³

Customize the distribution of reports (example: weekly newsletter)

Legacy publishes a weekly employee newsletter called Insight. Because there are five hospital sites, this is a very important communication tool. Insight covers issues including new construction, movement of departments, employee recognition, and quality improvement, as well as recycling and source reduction news.

In the Housekeeping Department at Legacy Good Samaritan, one Insight was originally ordered for each of the 75 employees; most were recycled, untouched, each week. By reducing the number of this double-sided, two-sheet document in Housekeeping alone to 25, Legacy will save over 10 reams of paper each year.

Total waste prevented:	50 pounds/year ⁴
Percent of waste prevented:	66%
Purchasing savings:	\$ 25
Disposal savings:	\$ 2
Net savings:	\$ 27

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1. Before the 40% reduction, the paper used each month would stack approximately 2 feet high. 250 sheets of 11" X 17" green bar paper weighs approximately 5 pounds.
 2. 250 sheets of this paper measures 17 inches wide, 11 inches long, and 1 inch high.
 3. One box of 2,800 sheets costs approximately \$19. Avoided disposal cost is \$0.05/pound.
 4. 10 reams of paper = 50 pounds.



Customize the distribution of reports (example: daily census)

Another example of eliminating the printing and distribution of unread reports is Legacy's daily census/financial report. This is an extremely complex report; at Legacy Good Samaritan, the full report is approximately 3,000 pages long. When the report received full distribution, operators would manually separate the report into approximately 340 parts, apply a unique delivery label to each section, and then distribute the reports appropriately.

Historically, Good Samaritan's computer did not allow operators to print selected parts of the daily census. So even if some sections of the census were not delivered, the whole report would be printed, resulting in the same amount of paper waste. To solve this problem, the Information Services department purchased a computer program which keeps designated sections of the report from being printed. This program had a one-time cost of approximately \$4,000, not including staff installation time, and can be used to customize many of the reports managed by Information Services.

To help justify the purchase of this program, Information Services sent out a survey with all 340 of the daily census reports. Department managers were asked to indicate if they did not want to see the report, or if they could do without the hard copy in the future if on-line viewing was made possible. 70% of the surveys were returned; 23% of these said that they didn't want the hard copy, while an additional 22% said they could do without the hard copy if they had on-line viewing. With these results in hand, including the names of departments which do not want to receive specific reports, Information Services is customizing distribution of the daily census at the time of this writing, and has already customized printing of the general ledger.

Total waste prevented ¹ :	3,504 pounds/year ² 2.81 cubic yards/year ³
Percent of waste prevented:	16% (23% of 70%; see above)
Gross costs:	\$4,000 (program, one time expense) ⁴
Gross savings:	\$1,260/year (paper) ⁵ \$175/year (disposal) <u>\$8,760/year (labor)⁶</u>
Net savings:	\$9,222/year ⁷

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1. This analysis is for the daily census and financial report only. It does not include other reports, such as the general ledger, which Information Services is also customizing distribution of using this new program.
 2. 16% reduction of 3,000 pages per day, 365 days/year = 175,200 pages/year. 250 sheets of 11" x 17" green bar paper weighs approximately 5 pounds.
 3. 250 sheets of this paper measures 17 inches wide, 11 inches long, and 1 inch high.
 4. This cost does not include programmer time to install and maintain the program. However, this program is used to customize distribution of other reports as well.
 5. 2,800 sheets of this paper costs approximately \$19.
 6. This reduces operator time spent separating and labeling the individual parts of the daily census and financial report by approximately 2 hours/day, 365 days/year. Operators are temporary labor, paid approximately \$12/hour.
 7. To annualize the cost of the computer program, a J-year amortization at 8% interest was assumed.

Consolidate multiple forms

The different nursing departments at Legacy Emanuel used to record patient information on a variety of different forms, several of which wasted paper by only using a portion of the full page. Many of these departments have consolidated multiple forms into a single “flow sheet”. The result is that space on both sides of the page can be utilized more efficiently, and staff have fewer forms that have to be managed.

An example of this change is the Pediatrics and Pediatric Rehabilitation Department, which consolidated seven different forms (including vital signs, fluid balance, procedures, nurse’s notes, and special medications) into a single flow sheet. The first change was to an odd-sized sheet of paper, and so may have increased costs. In the spring of 1994, Pediatrics changed to an 11" x 17" form, folded once, and printed on both sides. The result is paper savings of 71%.

Total waste prevented:	300 pounds/year ¹ 0.25 cubic yards/year ²
Percent of waste prevented:	71%
Net savings:	\$158/year ³

Reduce extra copies of forms

Some forms have extra copies which are never used, but are immediately thrown away. Eliminating these extra copies can cut waste and save money.

The Devers Memorial Eye Clinic, for example, uses approximately 500 “patient charge sheets” each month. Previously, this 8 1/2" x 11" custom-designed form was purchased in triplicate. Recognizing that the third copy was never used, only a duplicate form is now purchased.

This is a small change, but similar efforts throughout Legacy Health System, which has more than 5,000 different forms in circulation, could lead to large savings.

Total waste prevented:	60 pounds/year ⁴ 0.05 cubic yards/year ⁵
Percent of waste prevented:	33%
Net savings:	\$199/year

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1. 500 sheets of paper = 1 ream; 1 ream = 5 pounds.
 2. One ream of paper measures 8 1/2 inches wide, 11 inches long, and 2 inches high.
 3. Includes \$143/year for paper and \$15/year for disposal.
 4. 500 sheets of paper = 1 ream; 1 ream = 5 pounds.
 5. One ream of paper measures 8 1/2 inches wide, 11 inches long, and 2 inches high.

Recycle waste that can't be prevented

In 1993, the three Portland hospitals, Legacy Good Samaritan, Legacy Emanuel, and Legacy Holladay Park recycled over 1,000,000 pounds of materials. This included office paper products: 532,000 pounds; cardboard: 380,000 pounds; all six plastic resin types: 70,000 pounds; and glass, metals, foam: 55,000 pounds. This saved the system \$45,000 in avoided disposal costs.

The recyclables are collected by flooding the departments with the bag and rack system. For example, the Pharmacy at Good Samaritan has 14 racks, while Patient Recovery at Good Samaritan has 16. The surgery department at each Legacy hospital co-mingles all the acceptable plastics in large plastic bags (which are then reused in other capacities). Housekeeping collects the bags and brings them to the Recycling Depot, where both paper and plastic are sorted.

Plastics are collected from all five Legacy hospitals, and then trucked to the Recycling Depot at Good Samaritan, where a team of developmentally disabled adults sorts the plastics according to specification. For the safety of the handlers, only clean, non-patient contact materials are accepted into the recycling program.

There is also a reuse area in the Recycling Depot, where employees and local schools regularly come to get office supplies that have been recovered. These items include binders, folders, paper clips, rolodexes, cassette tapes, in/out boxes, etc. Employees have taken plastic containers (that packaged materials for procedures such as open heart and eye surgery) home to plant tomatoes, use as kitty litter boxes, or simply organize household items.

The Recycling Specialist works directly with many manufacturers concerning products and packaging. Manufacturers including Kimberly Clark, Sherwood Medical, Johnson & Johnson, and Vollrath are involved in a Hospital Plastics Recycling Program to help support the economics of recycling. Legacy has also worked with Baxter on source reduction and with Western Paper on recycling programs.