



Sustainable Urbana

A Place to Work, Live and Grow

MUNICIPAL BUILDINGS—implement building design and construction methodology that is environmentally sensitive, healthy, productive, cost effective and energy efficient.

Accomplishments:

1. Reviewed building roofs to determine if the roofs could be converted to green roofs. The result is that the Fire Department and Civic Center are capable of being converted to green roofs. The City Building cannot be converted, but a white membrane was placed on the City Building roof to reduce cooling costs. Converting to green roofs will be considered as the roofs are scheduled for replacement, but when not feasible, white roofs will be installed.
2. Replaced incandescent light bulbs with compact fluorescent light bulbs in all of the City buildings to reduce energy usage.
3. Installed programmable thermostats in the Public Works Center to better control building temperatures.
4. Motion detector light switches have been installed in some rooms to turn off lights when no one is in the room. (For example, the copy room and some conference rooms at the City Building.)
5. An energy audit has been completed by the Illinois Waste Management and Research Center to determine ways the City can reduce energy and costs in each building. Recommendations in the report will be pursued.
6. Installed motion detector water faucets in two public restrooms at the City Building to reduce water usage.

Opportunities:

1. Tankless water heaters will be installed in all facilities to reduce heating water that is not used.
2. Solar collectors that serve as shelters for cars in parking lots are being researched as an option to provide energy while providing protection from the elements for parked cars.
3. Explore the placement of solar collectors on the Civic Center and other City facilities.

4. Initiate an employee education campaign to reduce energy costs, i.e. turn off lights when rooms are unoccupied, keep room temperatures higher in summer; lower in winter to reduce energy usage.
6. The next City construction project should aim for LEED certification.
7. In new construction, combine the landscape design process along with architectural design process to allow the maximum benefit of surrounding/adjoining greenspace. Landscape planners are many times separated from the architectural process and left to utilize remaining post construction space for greenspace development.

Challenges:

1. Replacing windows at the Civic Center, while an option, is cost-prohibitive at this time.



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BUILDING AND REGULATION—develop building codes, policies and regulations that promote sustainable developments.

Accomplishments:

1. Developed new erosion and sediment control ordinance and manual of practice to reduce the impacts of construction on area streams, rivers, and lakes.
2. Adopted new energy conservation standards as a part of the International Code Series.
3. Amended the Urbana Zoning Ordinance to encourage sustainable Planned Unit Developments and to explicitly allow permeable pavement as an acceptable pavement surface.

Opportunities:

1. Adjust zoning/development code to accommodate sustainable features:
 - a. Allow/encourage the use of permeable surfaces for drainage.
 - b. Encourage the use of bioswales.
 - c. Encourage the use of cisterns for irrigation.
 - d. Allow solar cells and wind turbines in setbacks.
 - e. Encourage construction of “complete streets” in developments.
 - f. Allow narrower streets in developments.
2. Amend City’s Consolidated Plan to promote energy efficiency as a prominent policy for affordable housing.
3. Encourage training and certification in LEED for City staff members with the goal that at least one staff member receives certification in LEED.
4. Adopt new erosion and sediment control ordinance to reduce impact of construction on area streams, rivers and lakes.
5. Encourage developers to adopt post-construction best management practices for storm water management to enhance water quality.
6. Encourage or regulate topsoil removal/replacement in development areas to be replaced/refurbished to preconstruction soil conditions.

7. In new subdivision developments establish utility corridors that are separated from parkway tree areas to minimize utility/tree conflicts and ongoing tree damage resulting from utility repair.
8. Adopt Neighborhood Conservation guidelines to help encourage preservation and improvement of older neighborhoods.

Challenges:

1. Administration and enforcement of new erosion and sediment control ordinance.
2. Convincing developers and builders to adopt sustainable building and construction practices.
3. Finding a cost effective solution to creating utility corridors separate from tree root areas.



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ENERGY EFFICIENCY AND RENEWABLE ENERGY—Ensure City facilities are operated in a healthy, energy-efficient and environmentally conscious manner with other environmental conscious entities.

Accomplishments:

1. Joined Champaign County consortium to seek sources for electricity to reduce overall costs for citizens in Urbana.
2. Prepare Council packet information by copying on both sides of paper thus reducing the amount of paper used.
3. Place Council agendas, minutes and other packet information on-line to reduce paper use.
4. Banned smoking within City Facilities.

Opportunities:

1. Encourage employees to turn off personal computers, printers, copiers and non-emergency lights when leaving offices and buildings. [For two hundred computers reduces energy use from 227,760 kW to 61,007 kW (based upon 24/7 usage)].
2. Use electronic mail or other methods (e.g. flash drive or CD) besides paper to transfer information whenever possible.
3. Consider installing fax modems on computers to reduce paper usage and avoid printing junk faxes.
4. Re-use back of paper instead of recycling it after one side is used.
5. Recycle treated waste water. Use for irrigation of golf courses, landscaping, ethanol plants, etc.
6. Explore uses for methane gas produced at the old landfill site.
7. Cutting energy consumption. Summertime temperatures in and around facilities and within the community are lowered by enhancing the community tree canopy. Heating costs are lowered with an enhanced community tree canopy that blocks harsh winter winds.

8. Explore all options for energy savings when remodeling facilities.
9. Strive to meet or beat the Kyoto Protocol targets through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns.
10. Urge our state and federal government to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol—7% reduction from 1990 levels by 2012.
11. Urge the United States Congress to pass the bi-partisan greenhouse gas reduction legislation, which would establish a national emission trading system.
12. Encourage businesses to turn off sign and parking lot lighting at night.
13. Encourage the use of awnings to reduce energy costs during the summer months.

Challenges:

1. Maintain community tree vigor to provide healthy trees and improved shade through shortened tree maintenance cycles and additional tree planting. Tree decay spreads throughout a tree if left unchecked so regular pruning of deadwood is an important component to maintaining healthy trees.
2. Provide adequate lighting to promote safety within the community.



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FLEETS—Establish and promote operational policies aimed at creating and maintaining a fuel and energy efficient, environmentally responsible fleet.

Accomplishments:

1. Two hybrid vehicles (EX02, MP01) and eight flex-fuel vehicles (CD08, EX04, PD20, PW01, PW54 and PW64) are currently in the City's fleet.
2. Diesel equipment is currently fueling on an 11% bio-diesel blend.
3. Purchased a replacement rotary screw air compressor for shop operations that will require approximately 15% less energy to operate as compared to standard air compressors.
4. First draft of City-wide no-idling policy was sent out for department heads to review.
5. Three-year history of fuel usage was sent out to department heads for review. Will meet to set fuel conservation goals in the near future.
6. Compiled a list of all hybrid vehicles (with miles per gallon estimates) currently on the market that was distributed to department heads for their review to assist with decision making process for replacement vehicle purchases. E-85, compressed natural gas (CNG), and electric vehicle listings will follow.
7. Have approached MTD with a request for no charge or reduced rate bus fares for City employees. Representatives from MTD wish to discuss a more comprehensive approach.

Opportunities:

1. Promote non-traditional modes of business transportation, such as mass transit system, walking, bicycling, segways, etc.
2. Conduct successful discussion with MTD regarding employee bus passes.
3. Make bus schedules easily available to promote transit use.
4. Use technology to avoid travel. Use conference calls or webcasting to meet with others in different locations.

5. Encourage each department to establish a 10% fuel reduction policy and assist them in developing their policy.
6. Use a City newsletter and/or webpage (internal) to educate employees about fuel and other energy conservation tips.
7. Promote car pooling for both personal and City use. Explore the possibility of Zip Car program.
8. Implement driver training programs that demonstrate fuel conservation practices.
9. Consider new vehicles technologies when making vehicle purchases, such as LED lighting, lighter composite materials, more fuel efficient engine options, etc.
10. Explore potential to replace two parking enforcement patrol vehicles with hybrids this fiscal year.
11. Consider 10 hour working days to shorten work week to 4 days resulting in potential vehicle fuel and office energy savings.

Challenges:

1. Have explored the possibility of car-sharing company coming to Urbana-Champaign. Company would be interested if the University of Illinois would participate. Work with the University and City of Champaign to encourage the use of the Zip Car program.
2. Explore the possibility of a bio-diesel production facility. This would require the City to return to in-house fueling services (infrastructure cost \$150,000). This could be incorporated into a consolidated fleet study. A pilot study could be performed with LRC equipment and current fueling operations.
3. Reduce the number of vehicles in the City fleet while maintaining current service levels.
4. Provide employee incentives for walking or riding bicycles to work.



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INCENTIVES—stimulate demand for green buildings and green roofs by creating policies and incentives targeted to developers, building owners and managers, homeowners, insurance providers and financial community to facilitate adoption of green buildings, educate builders and the general public.

Accomplishments:

1. Have encouraged integration of green building features for City-sponsored projects, including Crystal View Townhomes, Denny’s Redevelopment, Kerr Avenue Redevelopment, etc.
2. Funded two eco-lab homes featuring innovative “passiv” house design with minimal energy consumption.
3. Certified ecological construction laboratory as a Community Housing Development Organization and funded operational costs using HOME funds.
4. Included green building features as desirable design standards for planned unit developments.
5. The Fire Department provides carbon monoxide detectors for residents to minimize the risk of carbon monoxide poisoning in homes.

Opportunities:

1. Forgive building permit fees for structures applying advanced energy efficiency features, such as geothermal, passive solar and straw bales construction or LEED certification.
2. Include extra points for energy efficiency for TIF RIP loans.
3. Encourage the inclusion of green building features of LEED certification as a part of City development and redevelopment agreements.
4. Amend zoning ordinance to provide incentives or variances to promote adaptive reuse of existing buildings.
5. Offer an exchange program to give hand push mowers to anyone who turns in a gas powered lawn mower.

6. Create incentives for residents to plant trees.
7. Establish a small grant program to promote energy efficiency in households.

Challenges:

1. Additional funding sources may be necessary to provide incentives for green buildings.
2. The City would need to find a source for disposing of the gas powered lawn mowers collected as part of any exchange program.
3. Increase tree survival in new subdivision areas where parkways are limited to compacted clay soils.



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INFRASTRUCTURE AND TRANSPORTATION—Develop green construction and operating procedures for all infrastructure.

Accomplishments:

1. Flashing lights operated by solar energy were installed on Windsor Road at Vine Street and on Springfield at Mathews.
2. Broken bricks from street and sidewalk reconstruction work were taken to Mid-America construction to be processed into landscape materials.
3. Asphalt and concrete are taken to Mid American Sand & Gravel for reprocessing into reusable materials.
4. Bricks from street and sidewalk reconstruction work are cleaned, sorted, stacked and resold to PACA.
5. Recycled asphalt and concrete are utilized for street and parking lot pavement construction and reconstruction.
6. Steel and aluminum from street signs and posts and other construction work are taken to Marco Steel for recycling.
7. Any appliances that are collected from illegal dumping are taken to Mack’s Recycling.
8. Street millings are re-used to resurface alleys.
9. Light-emitting diodes were installed in all red and green traffic signals to reduce energy use.
10. Scottswood Area Storm Water Improvement Project utilizes a wetland to treat storm water at Weaver Park.
11. Obtained \$900,000 “complete streets” grant for Goodwin Avenue.
12. Established a Bicycle Master Plan Committee and Task Force.

Opportunities:

1. Build narrower “complete streets” with wider parkways for trees and multipurpose paths in residential neighborhoods to encourage more bicycle and pedestrian traffic.
2. Develop incentives for motorists who drive alternative fuel vehicles or carpool.
3. Install storm water screening devices at Weaver Park and Busey Woods to improve water quality to these two natural areas.
4. Implement a “Green Alley” demonstration project. Replace pavement on an existing alley with new permeable pavement and monitor to determine performance of the permeable pavement. If demonstration project is successful, convert additional streets and alleys with permeable pavement where applicable.
5. Develop a bicycle master plan to include the implementation of a bicycle network throughout the City.
6. Consider “rubber sidewalks” to reuse recycled rubber tires and promote healthy street tree growth.

Challenges:

1. Local contractors have limited experience with permeable pavements and there has been little permeable pavement installed in the area to date.
2. Prevalent area soil types make use of permeable pavements problematic.
3. Narrower street designs will reduce on-street parking availability.
4. Narrower street designs may negatively impact emergency operations during a crisis.



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LANDSCAPES AND OPEN SPACE—expand and maintain landscapes and open spaces while conserving resources, expanding ecological diversity and involving local citizens in their environment.

Accomplishments:

1. Converted majority of the City's flower beds from annual to perennial plantings to conserve water and labor.
2. Use water absorbing crystals in planters and hanging planters to hold moisture longer and require less watering.
3. Worked with the University of Illinois to develop a rain garden.
4. Established a tree protection ordinance to protect the City's street trees.
5. Sponsor leaf collection in the spring and fall and Christmas tree collection for Urbana residents and return this material to the community in the form of marketable garden products.
6. Assisted with neighborhood clean-up activities along Philo Road and other targeted areas.
7. Posted information for residents interested in building rain gardens on the City's storm water webpage.
8. Partnered with the Champaign County Design and Conservation Foundation to complete the Lincoln Avenue/I-74 entryway medians, and Champaign County Courthouse parking lot and entryway plaza tree planting.
9. Partnered with IDOT to complete a prairie like installation in the Cunningham median north of I-74.
10. Funded water line improvements for Victory Park for a community gardens project using CDBG funds.

Opportunities:

1. Encourage developers to plant rows of trees in parking lots instead of individual tree islands.

2. Encourage the use of rain gardens, wetlands or infiltration areas instead of detention ponds as a way to deal with run-off within developments.
3. Require erosion control in developments.
4. Promote community gardening projects, such as the Master Gardeners' Idea Garden; and the Urbana Park District Community Vegetable Gardens.
5. Enhance tree maintenance and planting to gain a larger return on tax dollar investment in the community's green infrastructure through future benefits in energy savings, storm water management, clean air and quality of life.
6. Encourage the use of cisterns for irrigation supply.
7. Partner with Prairie Rivers Network to develop a brochure on rain garden construction for residents.
8. Encourage more square foot soil space for parking lot trees to enhance tree longevity and canopy cover. One solution for this suggestion is to promote development of linear green islands (minimum 8-foot width) between parking aisles that run the length of parking aisles as compared to only having green islands at the ends of parking aisles.

Challenges:

1. Design parking lot greenspace for consideration of snow and debris removal. Linear green aisles between parking aisles not only provide additional soil space for roots but also facilitate snow removal and sweeping by providing a long straight curb line as compared to extended end islands of irregular shapes and acute curb angles.



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REGIONAL FOOD SYSTEM—support the production, distribution and marketing of locally grown, healthy foods and value-added products that are available, accessible and affordable year-round to all City residents and are produced in an environmentally sound manner.

Accomplishments:

1. Market at the Square had encouraged residents to buy fresh food from local producers thus reducing the energy consumption required to ship food from other markets.
2. Information on integrated pest management is posted on storm water webpage to encourage residents to reduce pesticide and herbicide usage.

Opportunities:

1. Encourage community and individual gardens.
2. Expand the season for the Market at the Square or the Market in the Square.
3. Promote healthy food such as fruit, granola bars in city vending machines.
4. Support organic food for meetings and conferences; i.e. Strawberry Fields.
5. Create a site on our webpage to feature restaurants that buy locally, stores that sell locally produced food and/or farms that sell products that they raise.

Challenges:

1. Educate residents on the environment concerns of excessive use of pesticides and herbicides use on garden, landscape and turf areas.



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OUTREACH AND EDUCATION—promote environmental awareness and stewardship among residents.

Accomplishments:

1. The City held a recycling fair in October 2006 to celebrate the 25th anniversary of the City's recycling program.
2. The Environmental Management Division sends staff to elementary schools to discuss the importance of recycling.
3. The Engineering Division makes an annual presentation on storm water management to class at Urbana Middle School.
4. The Engineering Division created a brochure entitled, "You Are the Solution to Storm Water Pollution," to educate residents on steps they can take to improve the water quality of area streams, rivers and lakes. Brochures are distributed at various events and in the "Welcome to Urbana" recycling packets.
5. Public Works produced a popular statewide publication "Under the Canopy" that guides homeowners in creating personal greenspace around residential homes.
6. Public Works created a "How to Use Compost" flyer to promote community use of the Landscape Recycling Center's Garden compost product.
7. City Arborist maintains a public presence through regular PBS TV and radio appearances discussing tree and landscape topics.
8. Have utilized LRC revenues to increase demand for recycled landscape products through marketing and advertisement. As of May 2007 LRC garden product sales have increased 2217 cubic yards or \$15,650 over fiscal year 2006. These funds help subsidize the LRC operation.
9. City staff has attended various symposiums and events regarding sustainability.

Opportunities:

1. Encourage developers and contractors to recycle construction and demolition materials.

2. Distribute a newsletter, brochure, and/or include information on our website to inform citizens about ways they can reduce their environmental footprint. Some suggestions have been included in this document.
3. Increase awareness of the reduction in ecological footprint provided by the Farmer's Market.
4. Develop classroom curriculum on storm water for 5th or 6th-graders.

Challenges:

1. It is difficult to change routine behavior regarding environmental issues. For example, people have a set routine of fertilizing lawns, spraying weed killers and washing their cars in their driveways, which all have negative impacts on water quality.
2. Dedicating staff time to the design, development and publication of educational material.



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PROCUREMENT—strive to procure products with recycled material content whenever possible.

Accomplishments:

1. The City has an ordinance that requires the City to purchase recycled products when possible.
2. Office equipment purchases require the energy star designation.
3. Use recycled printer cartridges in office printers.
4. Recycled asphalt and concrete is specified in street and parking lot construction/reconstruction.

Opportunities:

1. Order office supplies monthly instead of last-minute to avoid shipping costs and reduce the supply company's energy consumption.
2. Save office paper by utilizing more page space (tighten up margins and spacing) and double sided copies.

Challenges:

1. As more people are demanding green products, some companies are labeling their products with vague terms that lead consumers to believe the products cause no harm to the environment or even help the environment. Consumers need to be savvy in determining which products to purchase.



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LAND DEVELOPMENT—make Urbana a leader in providing all of its citizens with development that conserves resources, provides a healthy and comfortable indoor environment, is durable and minimizes costs over the life of the structure.

Accomplishments:

1. Adopted a Comprehensive Plan that encourages compact, contiguous development that is consistent with individual neighborhood goals.
2. Adopted a Long Range Transportation Plan that emphasizes the promotion of non-automobile travel.
3. Pursuing a model energy conserving community as a part of the Kerr Avenue development with the assistance of Farr and Associates.

Opportunities:

1. Achieve Leadership in Energy and Environmental Design New Development (LEED-ND) certification for the Kerr Avenue project.
2. Look for opportunities for new commercial buildings to achieve LEED or equivalent standards.
3. Work with utilities and other agencies to make it easier to move buildings otherwise scheduled for demolition.

Challenges:

1. Balancing the restrictions of historic preservation with the necessary architectural changes for energy conservation.
2. Remove obstacles to infill development as a means of reducing sprawl and greenfield development.



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BONEYARD CREEK—expand public access and recreational opportunities while enhancing the habitat for wildlife and supporting economic vitality along the creek.

Accomplishments:

1. Sponsored annual Boneyard Creek Community Day to collect trash from the creek, remove invasive plant material.
2. Retained consultant to prepare Beautification Plan for section of the Boneyard Creek from Springfield Avenue to University Avenue.

Opportunities:

1. Adopt and implement Beautification Plan for section of the Boneyard Creek from Springfield Avenue to University Avenue.
2. Partner with Prairie Rivers Network and National Guard to create walking/recreational path along the Boneyard Creek from University Avenue to the Saline Creek.

Challenges:

1. The City currently possesses only a drainage easement for the Boneyard Creek and does not own the property adjacent to the Creek. The narrow drainage easement will make it difficult to widen the existing narrow channel width.
2. It will be difficult to expand public access and recreational opportunities for the sheet-piled sections of the Boneyard Creek from Lincoln Avenue to Race Street.



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WATER—develop and implement a comprehensive approach to ensure that the City’s water resources are protected, improved and managed so that water can continue to sustain us.

Accomplishments:

1. Sponsored the annual Boneyard Creek Community Day to install medallions on storm water inlets to keep residents from allowing harmful materials to flow into the storm sewer system.
2. The City has successfully complied with the Illinois Environmental Protection Agency’s Storm Water Permit Program for four years. Elements of the Storm Water Permit program include: public education and outreach, public participation and involvement, illicit discharge detection and elimination, construction site runoff control, post-construction runoff control, pollution prevention and good housekeeping practices. A copy of the City’s annual storm water permit compliance report is posted on the City’s storm water webpage.
3. Urbana’s 13,000 street trees intercept 1500+ gallons per tree or 19.5 million gallons of rainwater per year (based on 2004 Minneapolis study). This benefit creates a substantial savings in storm water management and enhances Urbana’s ability to meet the Federal Clean Water Act.
4. Held a symposium on the Mahomet Aquifer that addressed the limits to the aquifer with respect to ethanol plants and urban development.

Opportunities:

1. Work with Illinois American Water Company on a program to encourage residents to conserve water. Program could include incentives to install low water usage fixtures and modifying consumption patterns (lawn watering).
2. Enhance street tree longevity and vigor, as healthier more mature trees absorb more water, through a stepped up forestry maintenance program. Shorten tree trimming cycles from 12 years to 6.
3. Reduce rainwater runoff and heat reflection of parking lot pavement through the use of permeable pavement.

4. Public education campaign to reduce excessive fertilizer (salt)/herbicide applications (5+ applications per season) by lawn care companies to reduce excessive salt and chemical runoff into our stormwater/watershed.

Challenges:

1. Maintaining an adequate tree planting/replacement program in new subdivision developments with present staffing levels.



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WASTE AND RECYCLING—establish effective recycling practices for every area of the City’s commodity/waste stream and ensure that City departments are setting the example for the rest of the City through their efforts.

ZERO WASTE

"Zero waste is a philosophy and a design principle for the 21st Century; it is not simply about putting an end to landfilling. Aiming for zero waste is not an end-of-pipe solution. That is why it heralds fundamental change. Aiming for zero waste means designing products and packaging with reuse and recycling in mind. It means ending subsidies for wasting. It means closing the gap between landfill prices and their true costs. It means making manufacturers take responsibility for the entire lifecycle of their products and packaging. Zero waste efforts, just like recycling efforts before, will change the face of solid waste management in the future. Instead of managing wastes, we will manage resources and strive to eliminate waste."

- Institute for Local Self Reliance (Washington, DC) -

There is clearly a trend being acknowledged by government agencies, as well as private sector entities, to recognize the importance of a fundamental change – **that discards traditionally perceived as garbage in need of disposal should be seen as commodities or resources to be recovered**. This results in the need to adopt and enact policies, goals, strategies, and programs to effectively **manage resources rather than to manage wastes**. This is a significant shift in thinking about the entire production and consumption cycle – and consideration of the impacts of raw material extraction, product design, production processes, product sales and delivery, consumer product choice, and how we manage discards after use and consumption. While Zero Waste may never be literally fully attained, it is nonetheless, a true goal to aspire to meet.

Accomplishments

1. Since the inception of the residential and multifamily recycling programs, over the last 20 years, some 25,500 tons of commodities have been recovered which has resulted in a reduction in greenhouse gas emissions by approximately 21,500 metric tons carbon equivalent (MTCE) and an energy savings of approximately 470,000 million BTU’s.
2. The city annually provides fall and spring collection of leaves for composting.

3. Urbana residents have had access to six, one day Household Hazardous Waste events since 1987. The last event was held in 2006, and is funded through IEPA grants that are received about every 2-3 years. A funding request is currently on file with IEPA.
4. Tire collection events, also funded by IEPA, are held about every other year.
5. Electronics collection events have been held every year since 2005, with the last event recovering 72,000 pounds.
6. In 2005, Urbana's waste diversion rate was estimated to be at least 32%, including recycling and composting activities throughout the city. This exceeds the State's goal of 25% and is just below USEPA's 2008 goal of 35%.
7. Have created/maintained the only financially self-sustaining municipally operated Landscape Recycling Center in the State of Illinois.
8. Established a community resource for recycled garden products that has returned over 50,000 cubic yards of recycled landscape material to community landscapes in the last 7 ½ years.

Opportunities

1. Adopt a resolution establishing a Zero Waste goal by 2020.
2. Convene a Zero Waste working group to review data and develop a Zero Waste Strategic Plan and recommendations to achieve the Zero Waste goal.
3. Significant recycling potential remains and can contribute to energy savings, reduce carbon dioxide emissions, air quality improvements, resource conservation and financial savings, as well as job growth and economic development.
4. Reduce the quantity and toxicity of materials being landfilled- investigate the possibility of establishing a permanent household hazardous waste facility.
5. Employee training of the importance of recycling and government agency programs can lead by example.
6. Consider sponsoring a City-wide reduce/reuse/recycle event every year to provide a place for residents to purchase and dispose of usable goods.
7. Encourage schools to enhance recycling programs.

Challenges

1. Overcome the public perception that discarded materials are "wastes". Instead cultivate the viewpoint that discarded materials are commodities that can be reduced and/or recovered.
2. Developing local public/private sector partnerships to realize benefits of Zero Waste.
3. Conducting a strong and repetitive public education campaign.

4. Lack of accurate generation and recovery data to guide the focus future recovery efforts and to determine reliable diversion rates and successes.
5. Implementation of programs targeted at specific sectors of the commodity/waste stream due to regulatory constraints, economies of scale, and/or funding.
6. Additional staff and a coordinating administrative structure may be needed to plan and implement Zero Waste goals and programs.
7. Secure compost sales to commercial garden centers.
8. Secure a position on State contracts within the Champaign County for use of the Landscape Recycling Center's products.

CONSTRUCTION AND DEMOLITION (C&D) DEBRIS

The quantity of C&D debris generated is subject to wide debate and data is as varied as the type of building structure, roads, or bridges built and materials used in construction or renovation. Industry experts estimate that nationally, including road and bridge debris, the quantity generated - some 386 million tons, is greater than the municipal waste generated - 245 million tons. The quantity of C&D generated is usually a direct function of the economic vitality of a given community.

C&D debris should be understood as a "family" of different generation streams - in the broadest definition there are residential/commercial building related debris, infrastructural debris - i.e. roads and bridges, land clearing debris, etc. Even within the family of building related debris there are variations to be noted. New construction, renovation, and demolition activities each produce a different generation streams, and within these categories, residential and non-residential buildings add additional complexities or opportunities.

Local data

In the 2005 Urbana Recycling Report, C&D was estimated to be about one third or about 13,000 tons per year (TPY) of the commodity/waste generated in Urbana. However, this estimate was derived from the waste characterization data found in the initial Champaign County Solid Waste Management Plan (CCSWMP) and that data was gathered from local landfills 20 years ago. Upon further investigation, as acknowledged in that report, the quantity of C&D was an unusually high percentage, 2½ times as great, as compared to national data and was likely due to the capital improvement programs being undertaken by the University at the time.

In order to attempt to supply a more current estimate of C&D quantities specific to the Urbana, a review of building and demolition permits issued by Urbana over the last four years was undertaken for this report, and estimated generation data taken from several sources was applied to refine estimates. Reclaimed asphalt/concrete from road projects was not included, since it is reused on site and is not intended to be discarded.

Based on this methodology, C&D resulting from new construction ranged from 1124 to 2265 tons - an average of 1588 tons per year. Demolition activities would see a range of 2145 to 5889 tons – an average of 4860 tons per year (see Table 1). But as shown, quantities can vary widely from year to year. With these data estimates, it would appear that the C&D portion of the commodity/waste stream is not as great as previously reported and would be reduced from 13,000 to about 6500 TPY, using an average over the last 4 years. C&D would then represent about 20% of Urbana’s waste/commodity stream. (There are several generation studies now being conducted by USEPA and others, and will be updated.)

Table 1. Estimated Urbana Data

Year	New Construction		Demolitions		Total tons
	Sq. ft.	Tons/% of Total	Sq. ft.	Tons/% of Total	
2003	680,343	1360/39%	37,311	2145/61%	3505
2004	802,309	1604/29%	66,999	3852/71%	5456
2005	1,132,590	2265/23%	131,390	7554/77%	9819
2006	562,365	1124/16%	102,420	5889/84%	7013
Total	3,177,607	6355/25%	338,120	19,442/75%	25,797
4 yr. Average	794,402	1588/25%	84,530	4860/75%	6448

Demolition vs. new construction

Nationally, it is reported that demolition activities are estimated to constitute 48% of all building related C&D debris, followed by renovations at over 44% and new construction is the smallest sliver at about 8%. Data generated specific to Urbana sees demolition comprising 75% and new construction 25% of total estimated tons generated averaged over the last 4 years.

The types of materials that could potentially be recovered from “general building” demolition is shown in Table 2. Table 3 is even more specific and represents the potential recovery of materials generated from new construction of a “typical” 2000 square foot home.

Table 2. General Building demolition

Material	Percentage
Concrete/rubble	40-50
Wood	20-30
Drywall	5-15
Asphalt roofing	1-10
Metals	1-5
Bricks	1-5
Plastics	1-5

Table 3. “Typical” home new construction

Material	Weight (in lbs.)	Percentage
Solid sawn wood	1600	20
Engineered wood	1400	17.5
Drywall	2000	25
Cardboard (OCC)	600	7.5
Metals	150	1.8
Vinyl (PVC)	150	1.8
Masonry	1000	12.5
“Toxic” materials	50	.06
Other	1050	13
Total	8000	100

In general building demolition the top three commodities generated are concrete, wood and drywall. And for new residential construction - wood, drywall, and masonry or other materials are about even. Although cardboard is not nearly as significant in terms of weight, it is in volume. Quantities of cardboard are increasing in new construction since more building components are delivered as finished products ready for installation. Cardboard can represent as much as 30% of the total volume of discards, and if unconsolidated or boxes are not flattened, boxes just take up volume. Often contractors unnecessarily just pay for air, when in fact cardboard is a valuable commodity in demand.

General management strategies

A hierarchy of strategies to manage C&D would be: Reduction, Reuse, Recycling and non-recoverable items being landfilled.

C&D reduction would be accomplished by careful estimation of quantities of materials needed for construction – contractors shouldn't pay for materials not used and then again for disposal of unused items.

Reuse during construction would involve such practices as using inert materials like bricks and concrete for fill under driveways, placing “leftover” insulation in attics, saving excess flooring sheet goods for future use, etc. In demolition, reuse would involve recovering functional lumber, plumbing fixtures, appliances, etc., or grinding concrete or asphalt.

Recycling of wood, aluminum, shingles, cardboard, etc. usually involves 3 options:

Mixed material collection in either new construction or demolition, where materials are transported from the job site, processed and sorted at a facility and transported to manufacturers;

Source separation where materials are kept in separate containers depending on market specifications from other materials, i.e. cardboard segregated from metals;

On-site processing is usually reserved for large sites where machinery is brought in and materials are processed on-site for on-site use – such as grinding old pavement.

In general, recycling activities are usually easier to implement in new construction projects as opposed to demolition projects, but space availability can often limit the size and number of on-site containers in source separation.

Mixed material recycling activities performed off-site by processors involves a system of shredders and mechanical separation devices for maximum recovery attempts and requires an IEPA operating permit. Also mixed material processing raises concerns regarding certain materials that would have been used in construction of the building such as lead and asbestos and therefore certain handling and air pollution issues – such as dust, must be dealt with accordingly.

Most demolition contractors, especially when demolishing steel framed buildings, will segregate metals from sites and take to processors for sale. The high value of metals over the past several years, make this an especially profitable motivator. And it usually is common practice for concrete generated from demolitions to be recovered.

However, as with any recovery program, but especially those targeted from the C&D sector due to size and weight of materials, there must be viable markets available and they must

be local to avoid increasing transportation costs and related negative environmental impacts to make recovery actually cost effective and beneficial.

Finally, there are also “deconstruction” options that literally take a building carefully apart, rather than to demolish it. This method sees high rates of recovery and reuse of all types building materials. However, according to several articles, this practice is usually limited to houses and typically takes a crew 5 times longer and costs at least 25% more to undertake as opposed to traditional demolition.

Accomplishments

Since there are no formal reporting requirements of contractors for the quantity of materials that are recovered from either new construction or demolition activities, it is difficult to arrive at reliable recovery estimates for this sector. We have observed locally however, that recovery efforts are primarily occurring in demolition activities - such as recycling of concrete and metals. Since little has been done locally to identify markets and determine economic viability for materials generated in new construction, such as wood products or drywall, little to no recovery is occurring for this specific sector.

Opportunities

1. Develop specific information and strategies as a part of Zero Waste planning process.
2. Develop partnerships with builders and haulers to educate and implement recovery programs.
3. Encourage the expansion or new development of markets and C&D processors or restoration/recovery groups.
4. At a minimum, require the recovery of cardboard at all new construction sites. This could be implemented with little to no adverse impact to contractors.

Challenges

1. C&D recycling facilities in Illinois, except those located in Cook, Lake, and DuPage counties, must obtain solid waste permits from IEPA. This would require any business, outside of these counties, to obtain local siting approval which is a lengthy and costly process before securing an IEPA development and operating permit.
2. Economies of scale and lack of markets for certain materials e.g. drywall (gypsum) may hinder recovery of significant portions of recoverable materials.

COMMERCIAL BUSINESS RECYCLING

Discard Profiles

Like the residential sector, there are 3 material categories that comprise the bulk of discarded materials: paper- including cardboard (OCC), plastics, and organics. Together these materials can typically comprise two-thirds to three-quarters of total discards with

metals, glass and other discards the remainder. But unlike the residential sector, where discards are “relatively homogeneous” from household to household, the type and quantity of discards can vary widely depending on the type of business. As an example, the state of Vermont conducted a characterization profile of selected business types within the commercial sector. The chart below depicts the range of variations found in that study:

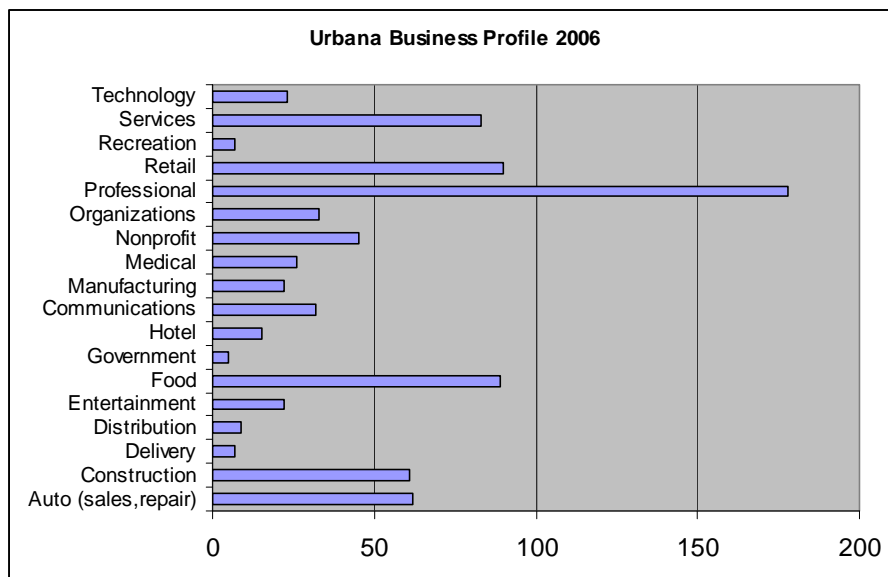
Vermont Study of Types of Businesses and their Discards as a Percentage of the Total

Category	Office	Retail	Restaurant	Grocery	Motels	Mixed	Average
Paper	54.1	37.6	17.5	36.9	41.9	20.7	34.8
Plastic	9.3	19.7	14.5	8.5	9.7	9.8	11.9
Metal	3.5	6.7	2	1.5	1.4	5.3	3.4
Glass	3.5	3.2	2.2	2.1	9	1.6	3.6
Organics	18.9	14.5	51.2	46.9	20.4	36.6	31.4
Other	10.5	19.4	12.7	4.1	17.6	26.1	15.1

As mentioned in prior sections, it is difficult to correlate this data relative to Urbana, as every community is different and has differing numbers of types of businesses that impact the type and quantity of discards. For example, the percentage of organics listed under office settings in the chart above, is unusually high. For large office complexes that also have on-site dining halls this may be reflective. Other studies, report a very small percentage of organics, under 5%, and very high paper percentages – as much as 90% for typical office settings. The latter would be expected to be the case for Urbana.

Local data

The chart below profiles the type and number of businesses within the City. There are approximately 800 businesses within Urbana city limits, and there is twice the number of professional businesses - banks, law offices, insurance firms, engineer/architects, etc. than any other group. While all businesses have some type of office, clearly this sector in aggregate, offers good potential for high grade paper for recovery.



However, providing recycling to businesses on an individual basis can often add to business expenses. Recycling is not free. Obviously, recyclers must make a profit, and many factors play a role in establishing the cost to recycle, or for that matter to collect garbage, including disperse locations of business locations – collection route efficiencies, frequency of collection, quantities collected, labor, overhead, profit, and rising operational costs. Thus the isolated cost to make a stop at any individual business location can be high. The more customers, the broader the income base and the more quantities of commodities that can be captured to add to expenses recovery and profit, while attempting to stay competitive.

Most of the businesses in Urbana, professional and other types, are relatively small to medium sized firms that tend to generate smaller quantities of potentially recyclable materials. Depending on the types and quantity of materials that are recycled at an individual location, the resulting commodity resale revenue may also be small and not sufficient to cover the additional recycling stop costs. Therefore the cost any given individual business may incur to recycle may actually add to their expenses, even if the quantity of garbage is reduced because the quantities of garbage collected is usually not a significant operating cost component.

However to retain customers, haulers as opposed to commercial recyclers, have an advantage and can subsidize the cost to recycle through the garbage service price structure. The optimum scenario is to substitute a garbage collection stop for a recycling stop. If a business is of such a size and requires at least 2 collection stops a week for garbage collection, often one stop could be substituted for a recycling stop, and businesses could see little financial impact. However, very few small to medium sized businesses, except for restaurants or others that dispose of food scraps or other putrescible materials, have the need for more frequent collection than once a week, and if they do, the most common solution is to increase the size of the container. More price structure data needs to be reviewed from the private sector to determine the net costs. But “cooperative sharing” discussed later may also provide viable recycling options.

There are a number of high generation locations such as food stores, medical facilities, manufacturing, and other businesses. Most all high generation locations have some sort of asset management program and realize the value of recovery of items that would otherwise be discarded as garbage and subsequent reduction in garbage costs and as such, many commercial recyclers are currently serving these locations. These recyclers are local and also there are regional brokers that collect “chain” stores through regional contracts.

In Downtown mostly OCC and paper is recycled. There is some collection of glass from bars which has been accomplished by a few locations cooperatively sharing both garbage and recycling collection costs through the same hauler. This cooperative sharing likely could be expanded, even for glass, but the hauler also requires that garbage service contract and does not just pickup recyclables, and businesses must be located close to each other. Cooperation between businesses and the hauler in sharing services and a location to place containers is essential for success of such a program. The market for glass has traditionally been of low value and is a difficult material to process, and at best is a break-even or a slight financial loss to collect and process. Consequently, haulers must be collecting other recyclable materials of value and/or adjust their service fees. Many cities have stopped collection of glass for these reasons and even locally, while the University of Illinois has very good recycling programs, glass collection was halted a number of years ago.

Portland, OR.

The City of Portland, has since 1996, required businesses to recycle at least 50% of their discards. Portland and Urbana share similar collection systems– private sector haulers (58 haulers in Portland) are permitted to provide garbage and recycling services in a competitive system, and there are no franchises (geographical territories assigned to a hauler). Customers are free to choose their hauler and negotiate price, services, collection location and frequency. Independent commercial recyclers are required to be registered with the city, and offer services for a variety of materials, including compostables, provide quarterly reports of quantities collected, but operate under a different set of requirements than permitted haulers and pay no waste related fees.

Some of the salient requirements for permitted haulers are:

1. To offer, and make known the availability of service to customers, the recycling for 14 principal recyclables (the same materials U-CYCLE collects, except yard debris),
2. Report each quarter the collected amounts of garbage and recyclables,
3. Allowed to subcontract for recyclables collection,
4. Must provide and complete a Recycling Plan Form for every customer,
5. Prohibited from disposal of any recyclables intentionally segregated from waste, and
6. Pay the city a \$3.80/ton fee for garbage collected, plus an annual fee of \$60.

There are stiff fines for infractions for these and other rules. It should be noted that the fee paid by haulers for each ton of garbage collected serves 2 functions, first it is an incentive to encourage recycling and second, it generates revenue for the Office of Sustainable Development to use for their programs. Of course this fee is ultimately paid by businesses through hauler rate structures.

Portland relies on targeted outreach, technical support and education to gain voluntary compliance with the 50% recycling requirement. While Portland states that businesses have generally met the 50% recycling goal, they are currently reviewing plans to increase recycling efforts.

In the proposed new plan – Portland Recycles! there is a brief discussion of the need to change the current system: *“The competitive nature of hauling services has limited the promotion and growth of waste prevention and recycling in the commercial system. To retain customers, haulers tend to offer the least complicated service at the lowest cost. This makes it difficult for them to promote expanded recycling services and remain competitive. In general, most businesses are very sensitive to price and will not demand expanded recycling service unless it represents a cost savings.”*

In the recommendations, they are proposing to adopt new standards for the commercial sector and acknowledge that 1) businesses can expect recycling costs to increase, 2) an intensive outreach and education plan is critical, and 3) additional staff and resources will be needed for monitoring, verification and enforcement.

Portland’s proposed recommendations are:

1. Establish a new 75% recycling requirement for mandatory business recycling.

2. Establish new mandatory food scrap diversion.
3. Establish new mandatory paper recycling for all businesses.
4. Increase mandatory C&D recycling ordinance to 75%.
5. Provide additional education and technical assistance for items listed above.
6. Promote salvage, reuse and recycled products in construction, remodel and demolition projects.
7. Adopt enhanced recovery of residuals from Material Recovery Facilities (MRF's).
8. Develop new hauler requirements to:
 - a. Allow customers to reach a 75% goal by offering "customized" service packages.
 - b. Require all trucks to use B20 biodiesel fuel & meet new emission standards.
9. Consider alternative regulatory scenarios:
 - a. Enhance existing competitive system.
 - b. A competitive system where city sets rates for service.
 - c. A franchise system with city rate setting and assigned service areas.

Survey of Urbana Businesses

In 2002, the City conducted a survey to gather information on the extent of commercial sector recycling and receive input from businesses regarding recycling. Just recently in May, another similar survey was conducted to update information. The links between economic and environmental benefits and recycling are strong. The 2007 survey asked the question "why do you recycle?". Overwhelmingly, the number one reason was because it is "good for the environment" with 60 choices, the second reason was "to reduce garbage costs" with 26 choices and 18 choices because it is "management policy". While only 9 haulers or commercial recyclers were named as providing services in 2002, the 2007 survey named 18 service providers. This is an indication of the growing demand, and private sector response, for commodities. Both surveys received responses from a fairly representative cross-section – both large and small firms, and by business type. The surveys were designed to not be too detailed so as to foster a good response rate, but it does provide a snapshot from this sector. A summary of other responses received from both surveys follows:

Results of Business Survey

	2002	2007

Number of surveys sent	660	571
Number of responses/response rate	122/18%	87/15%
Number of responses that currently recycle/percent of responses	57/47%	54/62%
Does the private sector provide adequate service options to recycle ? (All responses)	n/a	Adequate 40% Inadequate 29% No response 31%
Which option would be preferred for commercial recycling ?		
Businesses voluntarily determine to recycle or not	48%	31%
Businesses required to recycle by their choice of hauler	12%	7%
Haulers required to offer service to businesses	12%	13%
City contract funded by businesses	8%	7%
No response	17%	40%
Other	3%	2%

Both the 2002 and 2007 surveys indicate that the leading preference for recycling to occur in the commercial sector is to let businesses voluntarily determine whether to recycle or not. The next highest preference is to require haulers to offer recycling services. However, bear in mind that the 2002 response rate was about 1 in 5 and in 2007 about 1 in 7 businesses.

From the 2007 survey, 54 businesses indicate they have been recycling for more than one year and 33 do not recycle. The chart below provides a summary of whether the private sector provides adequate or inadequate service options for those that do recycle and those that do not:

Do you feel that the private sector provides adequate service options for you to recycle ?

	Businesses that do recycle	Businesses that do not recycle
Adequate service options	55%	18%
Inadequate service options	27%	30%
No response	18%	36%

It is interesting to note that regardless of whether a business is recycling or not, there are a relatively significant percentage of responses that indicate the private sector is not providing adequate service options for businesses to recycle. No detail was asked regarding this so this could mean that fees are too high, number of materials collected is limited, or simply that businesses are not aware of availability. Also there is a significant percentage that did not respond to the question.

Accomplishments

Paper, OCC, and aluminum are the 3 most commonly recycled commodities by businesses as indicated from survey results. However, the range is extensive – used oil, tires, grease, post industrial steel, and plastics, just to name a few. Reporting data from either haulers and/or commercial recyclers is not required so actual quantities are unknown. But conservatively, it can be stated that at least 25% of materials generated from the commercial sector is recycled, and if composting is included at least 50% is diverted from landfills. However, without more information it is difficult to ascertain reliable figures.

Opportunities

1. Require haulers to offer collection of the same materials as offered by U-CYCLE.
2. Consider establishing a recycling diversion goal for the commercial sector in concert with development a Zero Waste strategies.
3. Provide comprehensive education and technical assistance programs, through joint partnerships with the private sector.
4. Acquire more reliable generation and recovery data.

Challenges

1. Composting of food scraps is currently hindered by state permitting requirements.
2. Encouraging participation by private sector businesses and hauling firms.