



natural gas

wind



Austin Energy Green Building

Construction Waste Management



Cassidy Ellis – AEGB Project Coordinator
Construction and Demolition Ordinance Committee Meeting
Monday, December 9, 2013

- In 1991, AEGB developed the first rating system in the U.S. for evaluating the sustainability of buildings.
- AEGB staff:
 - provides consultation services on how to make buildings more energy and resource efficient, healthier, and durable
 - educates professionals and prepare the market toward sustainable practices
 - develops Energy Code amendments and local Ordinances



**AUSTIN ENERGY®
GREEN BUILDING**

*“To lead the transformation
of the building industry
to a sustainable future.”*

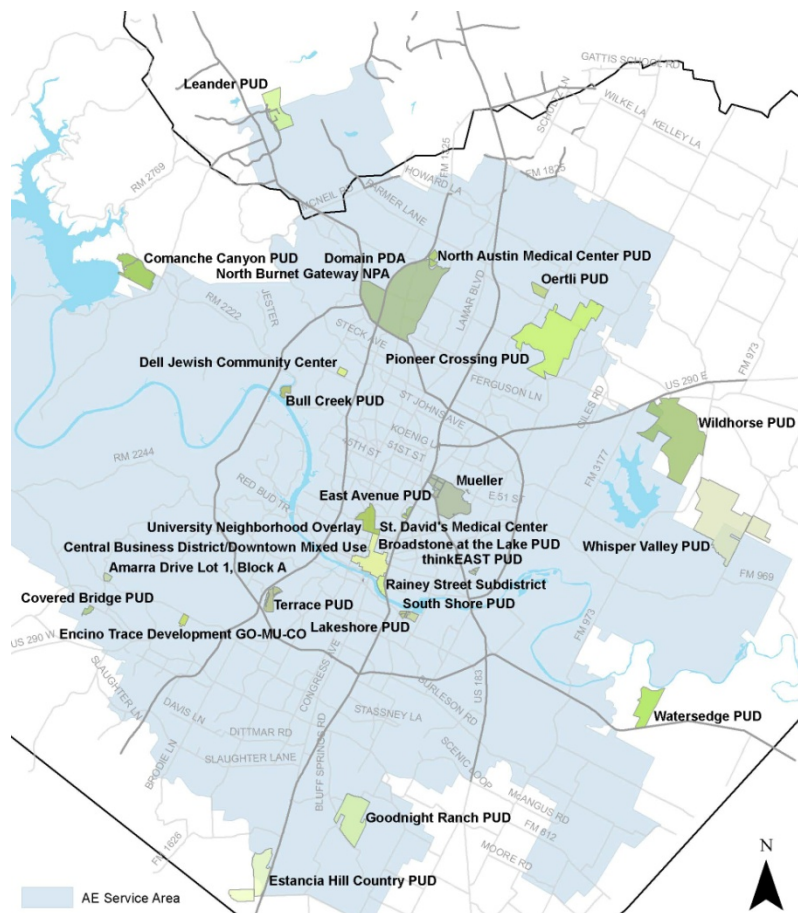
Green Building Rating Systems



- Commercial, Multifamily and Single Family Ratings
- All ratings on a 1-5 Star scale
- The Commercial Rating includes Basic Requirements and Voluntary Measures. The seven major aspects of sustainable design and construction are:
 - Integrated Design
 - Site
 - Energy
 - Water
 - Indoor Environmental Quality
 - Materials and Resources
 - Education and Equity

AEGB 2013 Commercial Rating	
1 Star	Basic Requirements
2 Stars	35-44 points
3 Stars	45-54 points
4 Stars	55-74 points
5 Stars	75 points +

Voluntary and Mandatory Green Building Projects



- Any project within AE Service Area is eligible for a voluntary AEGB Rating
- Mandatory Green Building Areas:
 - Downtown (CBD/DMU)
 - SMART Housing
 - Mueller
 - UNO
 - PUD Ordinance (2008)
 - Downtown Density Bonus
- AEGB Approval Process:
 - Site Permit Application / Letter of Intent
 - Building Permit / Conditional Approval
 - CO / Final Approval

- C&D waste diversion was an early goal of the program.
- The initial AEGB Commercial checklist (1995) included prescriptive and voluntary strategies to reduce C&D waste.
- In 2003, a performance-based Commercial Rating was introduced following the Downtown Green Building Ordinance and included a Basic Requirement for 50% diversion.
- The Multifamily Rating, introduced in 2005, adopted the requirement in 2007.
- The Single Family Rating includes a prescriptive CWM optional measure.

3.6 Strategies for Materials and Solid Waste	
3.6.1	Storage and Collection of Recyclables
	Recycling collection and storage area is constructed according to the Contract Documents.
3.6.2	Construction Waste Management Plan
3.6.2a	Waste Management Plan identifies proposed deconstruction and salvage opportunities, recommended recycling activities, licensed haulers and processors of recyclables, and potential markets of salvaged materials. Plan should also include estimated costs associated with recycling, salvaging, and reusing materials.
3.6.2b	Designate area specifically for construction and demolition waste recycling.
3.6.2c	Train site workers on the proper recycling protocol and label containers effectively (English and Spanish).
3.6.2d	Provide monthly reporting and feedback on the waste management plan to assess progress and address any problems.
3.6.2e	Exceed the Construction Waste Management (CWM) Plan goal by 25% for a total of 75% diverted from the landfill.
	Requirements: Provide copies of weight tickets for recycling, salvage and landfill with calculations demonstrating % by weight of construction waste diverted from landfills.

- Early projects relied more on sorting of C&D waste.
- Tight construction sites were at a disadvantage.
- Education and diligence helped ensure proper sorting and avoid contamination.
- Green Building Requirements in CBD/DMU, UNO and Mueller and project team education/consulting increased demand for C&D waste recycling, spurring development of infrastructure
- Considerable increase in feasibility as large landfills started recycling programs.
 - Waste Management / IESI / TDS



- Projects far exceeding 50% minimum
 - Most 75%, many 90%+
- Comingled dumpsters are now standard practice for most commercial projects
- Some materials can be difficult to recycle (gypsum, contaminated)
- Witnessing an overall reduction in waste
- Tenant finish outs somewhat unique
 - Less material, concrete/steel
 - Shared dumpsters
 - Still easily achieving 50%+



2003 - 2013 CWM Basic Requirement

- **Requirements:**

Recycle and/or salvage at least 50% (by weight) of non-hazardous construction and demolition waste excluding excavated soil and stone.

- Voluntary point at 75%
- Innovation at 90%

- **Required Documentation:**

- Specifications for Construction Waste Management in construction documents
- Construction Waste Management Plan
- Calculations from the AEGB Construction Waste Calculator
- Weight tickets for recycling, salvage, and landfill



H-E-B Slaughter Lane (2006)
81% Diverted

2013 CWM Basic Requirement

- **Requirements**

Recycle and/or salvage at least 50% (by weight) of non-hazardous construction and demolition waste, excluding excavated soil, stone, and land clearing debris.

Diverted material must include at least four material streams (i.e. concrete, metal, wood, gypsum wallboard, paper and cardboard, plastic).

- **Required Documentation**

- Specifications for CWM in construction documents
- Construction Waste Management Plan
- AEGB Construction Waste Calculator
- Weight tickets for all of the waste recycled, salvaged, or sent to the landfill, as requested



**Strictly Pediatrics (2007)
50% Diverted**

AEGB CWM Calculator



CONSTRUCTION AND DEMOLITION WASTE CALCULATOR



MATERIALS AND RESOURCES

PROJECT NAME

Sample Project

REQUIREMENTS

Recycle and/or salvage at least 50%, by weight, of non-hazardous construction and demolition waste, excluding excavated soil, stone, and land clearing debris. Diverted material must include at least four material streams (i.e. concrete, metal, wood, gypsum wallboard, paper and cardboard, plastic). One point is achieved if the diversion percentage is at least 75%. Final measure achievement is determined by AEGB review.

INSTRUCTIONS

1. In the Recycled Material Types table to the right, identify the minimum four material streams to be diverted from landfill associated with construction and/or demolition of the project. Also identify any additional material streams diverted from landfill during construction and/or demolition. Identify the hauler and final recycler location for each diverted material.
2. Record from the weight tickets the weight of each material type diverted from landfill as well as the weight of any waste sent to landfill. Exclude landclearing debris.
3. If exact material weights are not available, the Volume to Weight Conversion Calculator below may be used to estimate the weight.

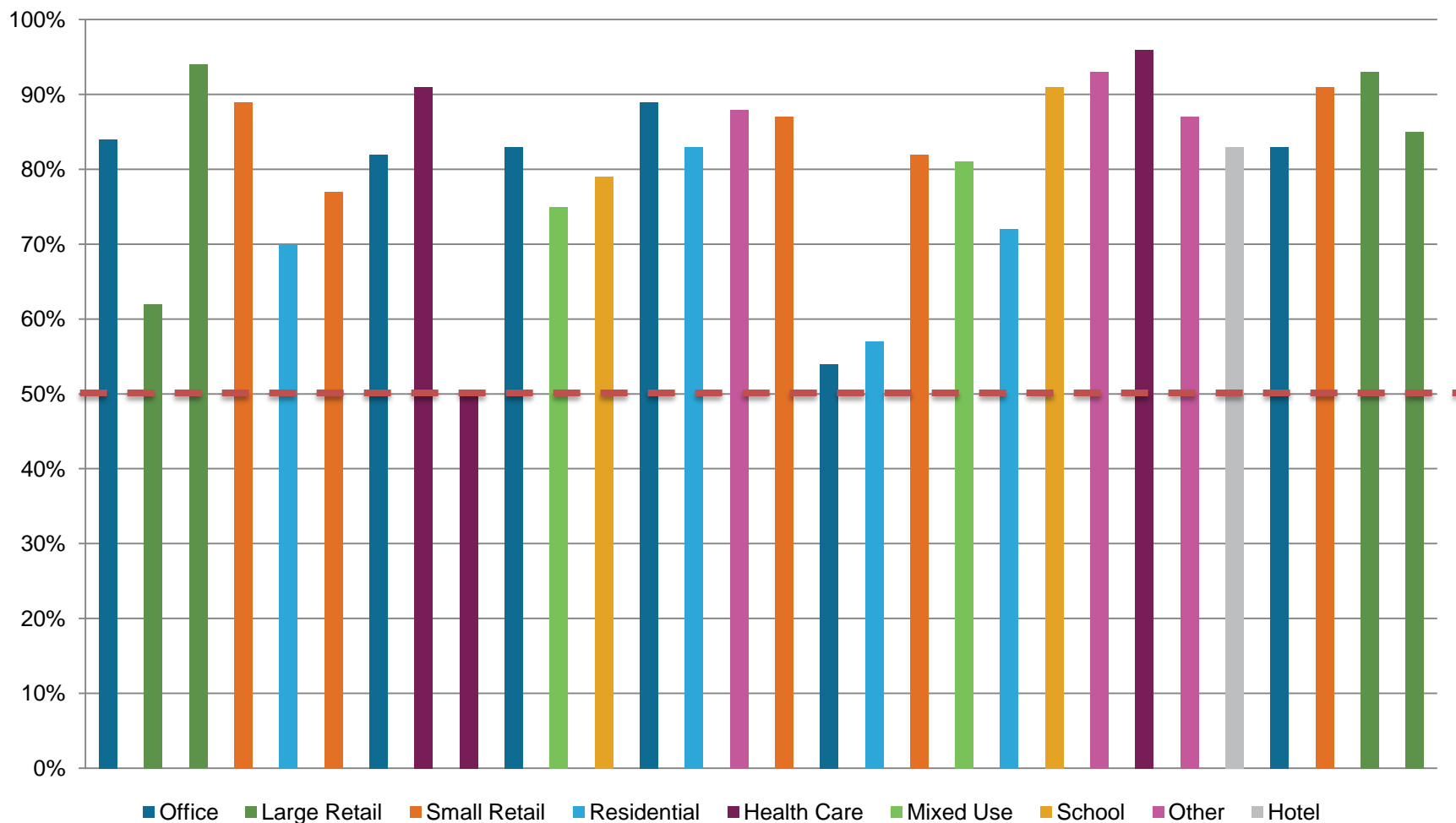
RESULTS		
CONSTRUCTION WASTE GENERATED	57.67	tons
CONSTRUCTION WASTE DIVERTED	52.90	tons
PERCENTAGE CONSTRUCTION WASTE DIVERTED	91.7%	
ANTICIPATED POINTS	1 Point	

RECYCLED MATERIAL TYPES TABLE			
	MATERIAL DESCRIPTION	HAULER	RECYCLING LOCATION
Required Material #1	Wood/Lumber	IESI	Texas Organics Products
Required Material #2	Metal / Tin / Steel	IESI	ABS Metals
Required Material #3	Paper / Cardboard	IESI	CT Shred
Required Material #4	Plastics	IESI	IESI
Additional Material	Sheetrock	IESI	Texas Organics Products
Additional Material	Concrete / Blocks /	IESI	FM 973 Pit
Additional Material	Demo Concrete	Recon	FM 973 Pit
Miscellaneous			

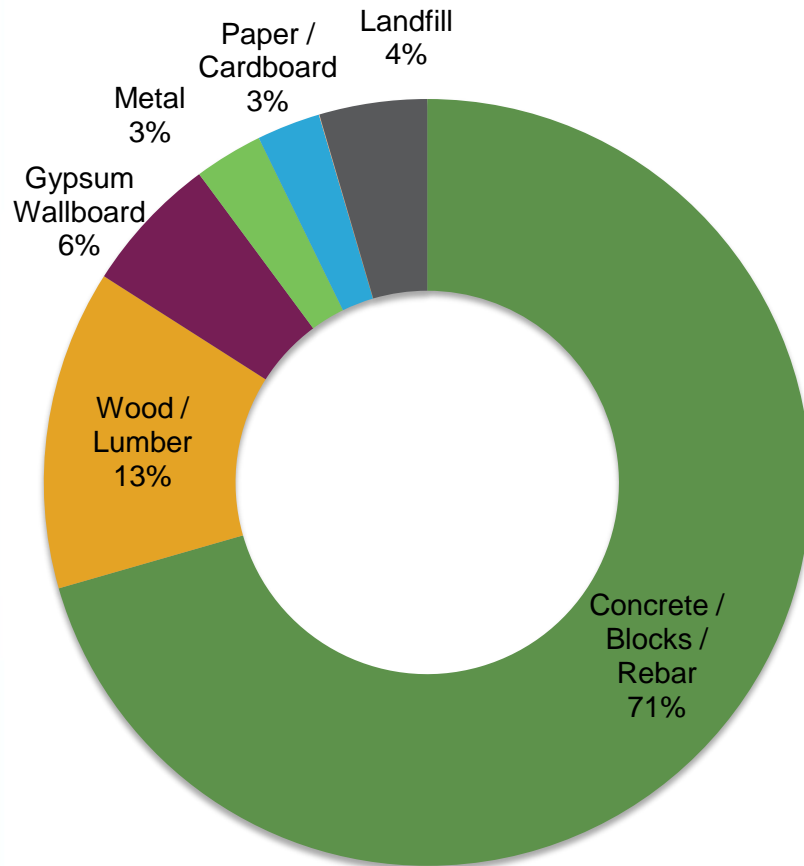
CONSTRUCTION AND DEMOLITION WASTE TABLE

WEIGHT TICKETS		REQUIRED DIVERSION				ADDITIONAL DIVERSION				LANDFILL	TOTAL WEIGHT		
Haul Date	Ticket #	Wood/Lumber (tons)	Metal / Tin / Steel (tons)	Paper / Cardboard (tons)	Plastics (tons)	Sheetrock (tons)	Concrete / Blocks / Rebar (tons)	Demo Concrete (tons)	Misc. (tons)	Trash (tons)	Total Weight (tons)	Total Diverted (tons)	% Diverted
01/03/13	481255							3.75			3.75	3.75	100.00%
01/14/13	521963	2.74	0.63							0.42	3.79	3.37	88.92%
01/22/13	525789	3.98					0.53			0.80	5.31	4.51	84.93%
02/05/13	564238	1.62	0.12				0.23			0.35	2.32	1.97	84.91%
02/14/13	587456	3.86	0.59		0.30		0.59			0.59	5.93	5.34	90.05%
03/08/13	600054						15.83			0.98	16.81	15.83	94.17%
03/26/13	612598	2.34			0.20		0.39			0.69	3.62	2.93	80.94%
04/02/13	633325			0.20	0.10		8.85			0.94	10.09	9.15	90.68%

Construction Waste Diversion by Project Type

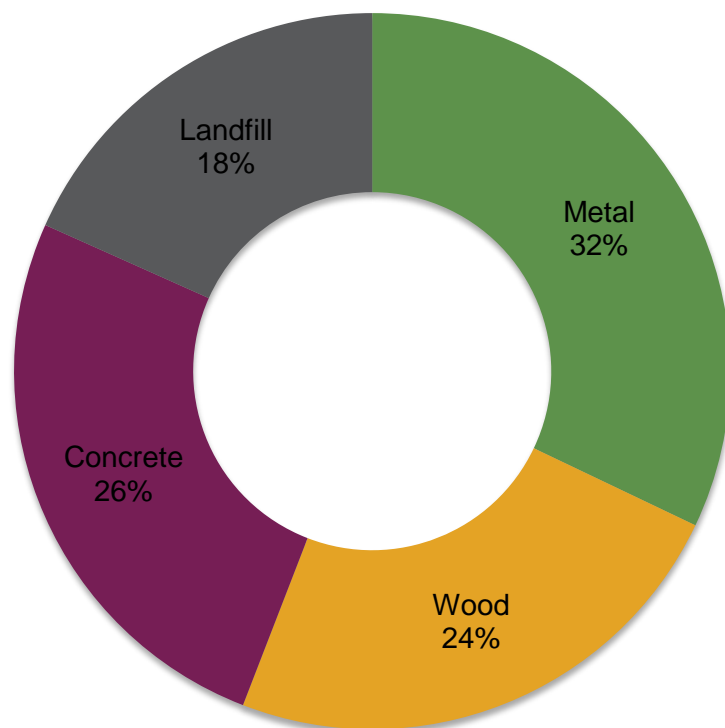


Dell Children's Medical Center W.H. and Elaine McCarty South Tower



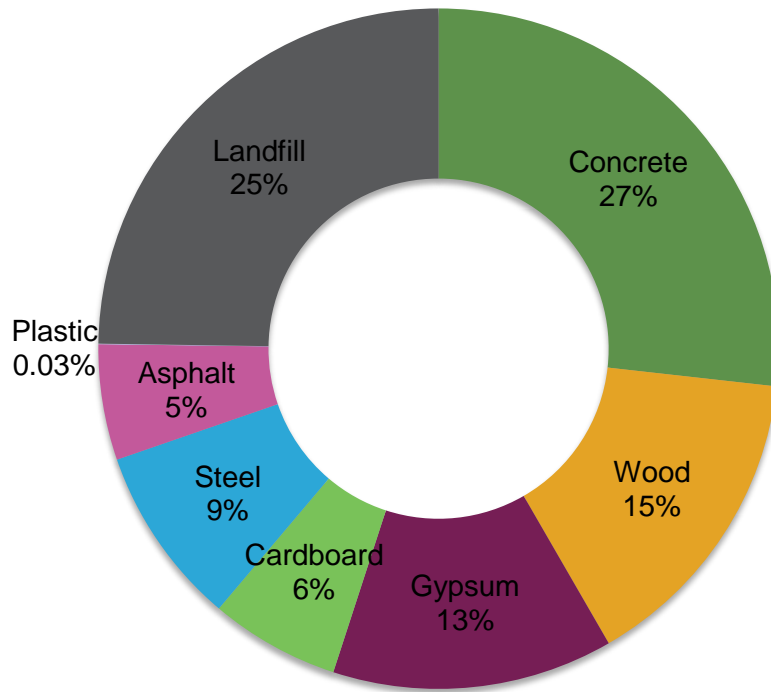
Patient Bed Tower Addition
Construction: Sept 2011 - May 2013
86,000 SF
AEGB 5-Star
96% Diverted

Starbucks – Mueller South Regional Retail



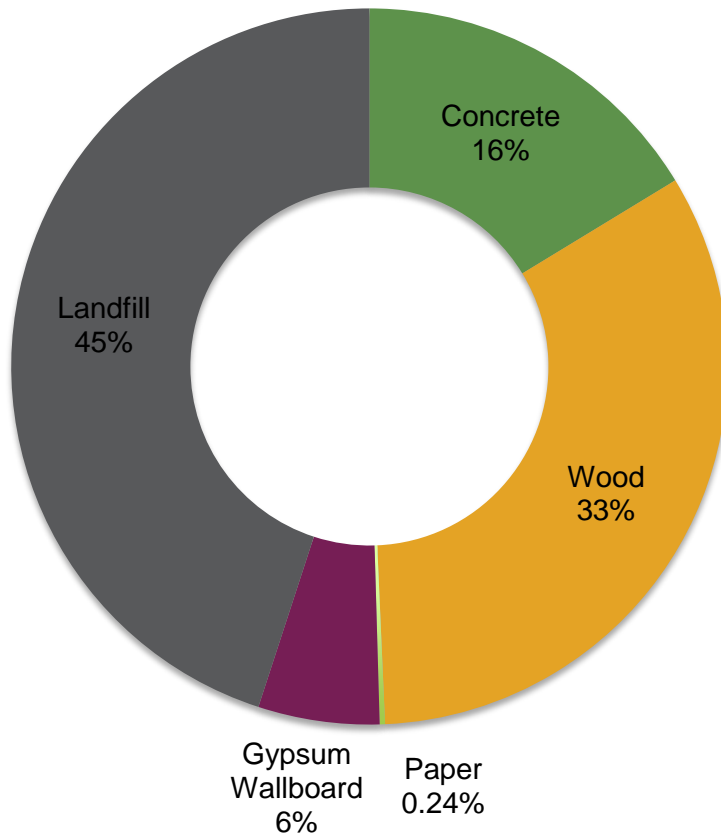
Small Retail Tenant Finish Out
Construction: Jan – Oct 2007
1,654 SF
AEGB 3-Star
82% Diverted (TFO Only)

Block 21 (W Austin Hotel and Residences)



Mixed-Use Tower
(Residential / Hotel / Music Venue)
Construction: 2007 – 2011
1.1 Million SF
AEGB 4-Star
75% Diverted

Mosaic Apartments - Mueller



Multifamily Residential
Construction: 2006 - 2009
540,000 SF
AEGB 3-Star
55% Diverted

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Thank You!