WE PROVIDE THE KNOW-HOW. You make the choice. You keep the savings. Motto: We provide the know-how. You make the choice. You keep the savings.

Mission Statement: Our team is committed to raising awareness and educating the residents of Oak Park about energy usage while providing guidance for reducing their carbon footprint.

OAK PARK CARBON FOOTPRINT REDUCTION

AK

Problem and Goals

The Problem

- Oak Park residents lack energy-efficient homes.
- Oak Park residents are not yet aware of longterm benefits and savings.
- The Village of Oak Park wants to be more energy efficient.
- The Village of Oak Park wants to retain the historic character of the community.

The Goals

- Evaluate Oak Park's building typology
- Assess their current energy usage
- Propose a comprehensive sustainability plan that will reduce the carbon footprint of Oak Park
- Distribute/gather information from home condition survey

The Team

Initial Team Configuration

Deliverables Sub-Team

Jessica Fong

Jeremy Kieser

Retrofit Research Sub-Team

Graeme Port

Casey Primm

Dustin Reznicek

GIS Sub-Team

Julieann Young

Shabarinath Pabba

 The sub-teams dissolved as individual group tasks were completed.

Final Team Configuration

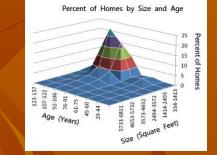
 The whole team then operated by delegating work among the team members, playing to individual strengths.

Research

Zoning laws History of Oak Park **Case Studies Energy Audit Building Typology Sampling Retro-fit options** Passive Active Community-wide





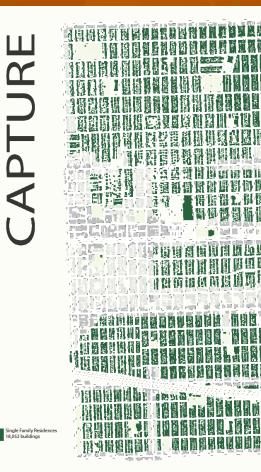






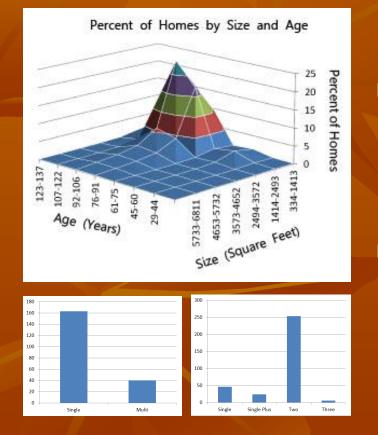


(GIS) Geographic Information System



- 1.7 billion gallons of rain fall on Oak Park
- 2.0 billion gallons of water purchased (8.8 mil dollars)
- Green roofing
 - Could cover up to 8.8 mil ft²
 - Drastically cut down storm water runoff
- Permeable paving
 - reduces flood damage
 - the need to de-ice roads
 - treatment of runoff

Village Energy Use

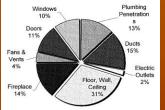


Reasonable Energy Reduction 25% on retrofitted homes 15% behavioral changes 21,000 Residential Homes Averaging 95 years old ■ 2,500 square feet Expected Impact per 10% 2.2 million saved by consumers ■ 6,500 tons of carbon

emissions prevented

Energy Audit





Leakage by Location For an AverageHouse

		<u> </u>		
AIR LEAKAGE CHECKLIST	AND R	ECOMMENDED CORRE	CTIONS	1000
			Priority Action Levels A. B. or C	0000000
			Client: K.C.Poulos	
	Severity	Location(s)	Correction	Priority
Drop-down stair	1	SW Bedroom	Pre-fab insul'd cover @ Insulated-	A
Fave Vents	1	Main Attic: IF CHOOSE	covers.com, or fabricate foam box Add blocking to prevent "wind	
Eave Vens	1	main Affic: IF CHOOSE roof insuln strategy	Add blocking to prevent "wind washing" at exposed insult.	A .
Back Fan		Artic Artic	DISAN E ITT	
Framing and Ohmen-Open to	Artic Bas	estent, or other areas	COLUMN STATES OF STATES AND ADDRESS	CROOM D
Vent or Chimney Chase	1	Attic Floor	Seal at attic floor w/ fire rated	A
			materials, eg. metal & foam.	
Chases (plumbing, electric,	1	Attic Floor	Cat/fit foam board & seal edges or	A
HVAC)			spray foam. Many acceptable seal	
			methods & materials.	
Floor Cavity @ Exterior - Rim	1	Becernent, Crawls	Cut and fit rigid insulation to fill cavity	A
Joist or other type		include with wall insuln at	at exterior; seal edges with spray	
Cabinets & Counters	2	crawls NW corner of kitchen	feam	
Cabinets & Counters	2	NW corner of kitchen	Seal gaps w/ caulk see blue tape	A
Pocket Doors	1	2nd Fl Bathroom	Difficult to correct. Try attic floor.	A
Finishes	12004	The second s	Contraction States of States	STATE.
Floor-Wall Junction	1	Throughout 1st and 2nd	Dense packing walls may solve this!	A
		floors.	Or Caulk with clear silicone, or remove	
			quarter-round, seal behind, & replace.	
Wood trim	2	Various windowsLv Rm	Caulk see Blue tape	۸
Recessed Fistures	1	Kitchen	Seal behind cover at drywall cut AND	
necesseo nacares		Musen	add air tight baffle inserts.	l ^
			-	_
Recessed Fixtures "eyeball"	1	On Rm, Ly Rm	We know of no correction for eyeball	A
type			or 4 inch types, except replacing with track lighting! Hopefully dense pack	
			cellalose in the walk with eliminate	
			this leak.	
Fixture Base: Electrical Box	1	Powder Rm wall light	Cault, or polyiso foam behind & into	
			box. Check w/ electrician	
Accessible Ducts	3	1st FI Living & Dining	Remove viryl "duct" tape. Run furnace	c
		Rooms	fan & mark leaks. Seal w/ mastic or UL	1
			Listed alum tape.	L
Insulated ducts	1	2nd FI Supply and Returns	Pan fan & mark leaks. Seal w/ mastic	A
		at ceiling	or UL Listed alum tape.	



Surface to be insulated	Location	/4	1/1		1/3	1/1		4/11	1	P.
Pitched Root, Rulter Cavities	Non Alte	40	19	84.55	5.5		rere	Action Plan	925	
Attic Floor, Bolew Flooring	Main Artis	- 49	0		2.8	Action Plan		Action Plan		
Attic Space, No Access	Rage Wardstein	49	15	897.55	1.0			Lot. R-00		
Wedt, Franse w/ Rhaces	1st and 2nd Ploons	- 18	0		3.5	04.35				
Floor above United	2nd Pl Badro- SW	29	or		7.8					
Floor above Unheated	3 season porch - 8	25	19	015.5.5"	4.4					
Place above Unitedited	W. perchirecters	25	19	89.55	-					
Floor Cavity Patienator	Bateriort					Rep.7				
Fluer Caulty Parintalor	Crowl Speces	- 10	19			Action Plan	-			
Reservent Wall	Urfinished lising	11						Action Plan		
Crawl Space Wall	South & West Crawls	- 11						Reps. 2"		
Form of Issuelation A Addresse agency Elecone B BlackotBet D Beene Pack L Loose (Includence)(r)	M Nation Files P. Pump-traplace face R Board S Spray Foam U Poundein glace			Institutes B or - D croix cl - cohices tys - cogani ty - thoughs fs - tableton	10,00		The - low di rev - tock of 01 - trippoly	THE T	rate	

					Client:	K C Paulo	5				
5×-		12/11/2009									
Outside	Outside Temp. 15 degrees F				House Volume Calculations:						
Indoor	Temp.	66 deg	rees F								
Wind	Speed	0-5									
louse P	Fan P	Ring O	Flow		Floor	Sq. FL	Height	Cu. Ft.			
^o a)	(Pa)	or ABC	(CFM)		Bernt	705	7.4	5217			
250		0	4400		181	768	8.4	6451			
23.8		0	2807		2nd	893	8.5	7590			
33.7		0	3290		3rd						
					Other						
					Other						
ote						Total V	olume:	19,258			
r Tightn											
varity of	Air Leakara	e Through t	he Thermal	Roun	dary						
and the			on manne.	ALC: NO	and a						
CH50 or Air Changes per Hour at 50 Pascals fan pressure											
		ACH50:	13.70								
CH50 Rati	ng: Ratings i	effect the con	dition of your	house	compared !	to what is typ	pically sean.				
reviewer (k-2 Ground 2-4 Ave. 4-8 Poors 2-8 Your ACHEO rating: Poor											
cellent 0-2	Good, 2-4	Avg. 4-8	Poor, >8		Your ACH	50 rating:	Poor				
			hanges per h								
			ACH _{rat} is calc					, taking			
ount far lo	cal climate, h	eight of the h	ouse, and win	id shie	ding provid	ed by the su	rroundings.				
				_							
	AC	H natural:	0.93								
					A 1001 (100 LA						
Effective Leakage Area (sq. in.) : 575 or 24" x 24"											
			leakage is the								
viding ventilation, except on windy days. We recommend direct fan-forced ventilation for every house so t											
			to and not d	epend	on the wind	. In tight ho	uses, mecha	rican			
tilation is e	issential eve	n on a windy i	tay.								

- **Standard Tests** Blower door Infrared scanning Combustion air supply Combustion appliance safety Benefits
 - Possible locations of air leakage
 - Assessed adequacy of current appliances
 - Recommendations
 - Installation methods

Case Studies









- Identify similar patterns among Oak Park housing typologies
- Identify common issues and solutions, especially in historic buildings
- Produce literature to educate Oak Park residents about opportunities
- Provide examples of costs and savings

Retro-Fit Options









- Attic and Wall Insulation
 Cellulose instead of fiberglass
 Larger initial cost
 - 40% more energy efficient
- Energy Star Appliances
 - 15%-50% more efficient
 - Save upwards of \$135 a year each
- Rain Barrels
 - For 55 gallon barrel \$60
 - Save 40% water bill in summer - irrigation

Ethical Issues

- Case study participants' privacy
- Village-wide retro-fit options may not be the best use of Village funds if other projects are more important
- Accuracy and relevance of our information to the Village of Oak Park
- Reliable and accurate source of research materials



Conclusions



- Do not immediately install community-wide retro-fit options, rather, implement incrementally as needed.
- Average Village member can save money by being aware of his/her energy use
- Oak Park home and business owners should consider having an energy audit performed

Future IPRO

- Create more case studies based on different house typologies • Work with the Oak Park Village Council to organize a plan of action Market research to find most relevant targets
- Expand on retro-fit research
- Research renewable energy
- Self-educate on Oak Park and its history
- Maintain a healthy relationship with Oak Park

Thank You! Any Questions?

The Village of Oak Park ■ IPRO @ IIT John Kelly • K.C. Poulos John Porterfield Jim Gill Don McLauchlan The Oak Leaves Oak Park Public Access

