Outline

• Options for Building and Developing Affordable Green Subdivisions
• Affordable Green Home Construction Options
• Affordable Green Development Options
• What are the Costs Associated with Each Option
• Case Studies
• Which has a Greater Impact?
• Advanced Energy Features
Two Questions:
What is Affordable?
What is Green?
What is Affordable?

Median Household Income & Housing Value 2008

- State of Wisconsin $48,000
- Milwaukee County $38,000 / $145,700 = 3.83
- Racine County $50,000 / $157,800 = 3.15
- Kenosha County $53,000 / $165,500 = 3.12
- Waukesha County $69,000 / $235,700 = 3.41
- Ozaukee County $74,000 / $243,400 = 3.28
- Washington County $60,000 / $207,200 = 3.45
What is Green?

Good Question!

• Types of Programs
  – Green Built Home (Wisconsin Environmental Initiative)
  – Energy Star Certification
  – NAHB Green Home Certification
  – LEED (US Green Building Council)

• House Construction vs. Development
• Which has the Biggest Impact on the Environment?
Green Home Construction

- Site Options
- Energy Star Certification (10% Annual)
- OVE Framing (10% Energy Savings)
- Energy Heel Truss (25% Better)
- Mechanical Systems (T-Stat 10-15%)
- Windows (50% Heat Gain/loss)
- Electrical (20% Lighting -75% Better)
- Plumbing (20,000 Gal + Annually)
What Does it All Cost?

- Energy Star Certification $400
- OVE Framing $500
- Energy Heel Truss $175
- Mechanical Systems $580
- Windows $100 (Low-E)
- Electrical $155 ($5-$7 per bulb)
- Plumbing $500
What Does it All Cost?

- 1400 Square Foot House at $65 per/foot Cost
- Bricks & Sticks Cost About $91,000
- Minimum Green Improvements $ 2500 or 2.47%
- This Premium Adds About $17.00 per/month and About $6000 Over the Life of a 30 Year Mortgage
### Advanced Green Features

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Low flow faucets/showers</td>
<td>$160</td>
<td>$0</td>
<td>2.2 gpm faucet/2.5 gpm shower</td>
<td>1.5 gpm faucet/1.75 gpm shower</td>
<td>8212 gallons</td>
<td>1058 gallons</td>
<td>$116</td>
<td>1 year</td>
</tr>
<tr>
<td>Dual flush toilets</td>
<td>$350</td>
<td>$0</td>
<td>1.6 gpm/1.6 gpm shower</td>
<td>.8 gpm/1.6 gpm shower</td>
<td>6752 gallons</td>
<td>3760 gallons</td>
<td>$415</td>
<td>1 year</td>
</tr>
<tr>
<td>Energy Star rating light fixtures</td>
<td>$1,700</td>
<td>$360</td>
<td>non-energy star rated</td>
<td>use 75% less energy</td>
<td>$90</td>
<td>$67.50</td>
<td>$68</td>
<td>25 years</td>
</tr>
<tr>
<td>Solar 1.2 kW PV Module System</td>
<td>$16,500</td>
<td>$2,845</td>
<td>none</td>
<td>produces 1563 kW-hr/year</td>
<td>10,000 kw-hr/year</td>
<td>1563 kw-hr/year</td>
<td>$187</td>
<td>88 years</td>
</tr>
<tr>
<td>Solar Hot Water System - 80 gallon</td>
<td>$13,250</td>
<td>$3,000</td>
<td>40 gallon power vented tank</td>
<td>heats 80% of hot water usage</td>
<td>212 therm/year</td>
<td>153 therm of gas</td>
<td>$180</td>
<td>73 years</td>
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</tbody>
</table>

*estimated price for solar packages do not reflect FOE rebate

*all number based on 2.5 bath home

**TOTALS:** $31,960 $6,205 $966

### Notes

- 4 family home

- one Therm = 100,000 Btu

- Therms per year 1450 cost = $1.18/therm

- kW-hr/year 10000 cost = $.12 Kwhr

- water usage 39785 cost = $.11/gallon
What is the use of a fine house if you haven't got a tolerable planet to put it on?

-Henry David Thoreau
Wisconsin Trends

Trends

- Population – 21.4% Increase from 1970-2000
- 2030 Population Estimated to be 6.42 Million
- Household Size Should Decrease from 2.5 to 2.3
- 88% of Americans Drive to Work
- 79.5% of Wisconsinites Drive Alone to Work
- Farm Land – 18% Decrease from 1975-2000
- Number of Farms – 25.5% Decrease from 1975-2000
- Water Conservation
- Climate Change
- Renewable Energy
- Availability of Land
Sprawl Causes

• Low Suburban Land Prices
• Low Transportation Costs
• Demographics
• Record Low Mortgage Rates
• Government Regulations
Impacts of Sprawl

- Higher Rates of Driving & Vehicle Ownership
- Greater Risk of Fatal Auto Accidents
- Increased Levels of Green House Gas Emissions
- Depressed Rates of Walking & Alternative Transportation Use (Mass Transit)
- Greater Loss of Public Open Space
- Risk to Wildlife Habitat and Endangered Species
- Health and Physical Activity
My Assumptions

- More Opinion - Less Fact
- Development Strategies Can Have Larger Impact
- Urban Sprawl is “Not Good”
- Government Regulations & Zoning Play a Large Role
- Development & Growth is The Answer….Not The Problem
- Being Against Sprawl Does not Mean Being Against Growth
Benefits Of “Smart” Growth

- Reduction of Greenhouse Gas Emissions
- Better Management of Rivers & Lakes
- Less Energy Consumption
- Preservation of Farm Land & Native Areas
- Utilization of Public Transportation Increases
- Increase of Public Park Space
- Wildlife Protection
Public Opinion?

- Poll Taken by the National Association of Realtors Found that 57% of Voters Would be More Likely to Purchase Close to Green Space or Park

- 50% Said They are Willing to Pay 10% More for this Amenity
Case Study

- 90 Lot Subdivision that Brookstone Homes Built in 2005
- Major Southeastern Wisconsin City
- Minimum Lot Size 80’ x 120’ (9662 sq ft)
- Entryway 100’ Pavement to 80’ Pavement
- All Other Roads Were 66’
- Original Density was 2.25 Units per/acre
What Was Done?

- Reduced Lot Size to 60’ X 100’
- Reduced all Roadway Size to 28’ and 25’
- Reconfigured Street Layout
- Assumed an Average of 2467 Square Feet of Impervious Surface per Lot
- Increased Density from 2.25 to 2.77
The Results

<table>
<thead>
<tr>
<th>Original 90 Lot Layout</th>
<th>New 111 Lot Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Density 2.25</td>
<td>• Density 2.77 (23%)</td>
</tr>
<tr>
<td>• Centerline 6392’</td>
<td>• Centerline 6833’ (7%)</td>
</tr>
<tr>
<td>• Impervious 10.9 ac</td>
<td>• Impervious 10.2 ac (-6.5%)</td>
</tr>
<tr>
<td>• Street Impervious 8.9 ac</td>
<td>• Street Impervious 3.9 ac (-56%)</td>
</tr>
<tr>
<td>• Open space 5.2 ac</td>
<td>• Open space 11.6 ac (122%)</td>
</tr>
<tr>
<td>• Pond Size 139,473 sq ft</td>
<td>• Pond Size 156,968 sq ft</td>
</tr>
</tbody>
</table>
### What About Tax Dollars?

<table>
<thead>
<tr>
<th><strong>90 Lots</strong></th>
<th><strong>111 Lots</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot Cost $58,771</td>
<td>Lot Cost $47,944</td>
</tr>
<tr>
<td>Home &amp; Lot Selling Price (25%) $235,082</td>
<td>Home &amp; Lot Selling Price (25%) $191,777</td>
</tr>
<tr>
<td>Assessment Ratio 102.08</td>
<td>Assessment Ratio 102.08</td>
</tr>
<tr>
<td>Assessed Value $241,664</td>
<td>Assessed Value $197,147</td>
</tr>
<tr>
<td>Mill Rate 15.77</td>
<td>Mill Rate 15.77</td>
</tr>
<tr>
<td>Annual Tax Per Home $3,811</td>
<td>Annual Tax Per Home $3,109</td>
</tr>
<tr>
<td>Total Annual Community Tax $342,994</td>
<td>Total Annual Community Tax $345,100</td>
</tr>
</tbody>
</table>
Summary

• Density Increase 23% (Only 21 Lots)
• Decreased Impervious Road Pavement 56% (5 Total Acres)
• Overall Impervious Surface Decreased 6.5%
• Open Space Increased 122% (6.4 Acres)
• Tax Revenue Neutral
Is It Affordable?

- Conservative Estimates put Home and Lot Cost at 20% Less

- 20% on a $235,000 Home is $47,000
  - That’s about $300.00 per/month
Will it Work?

• University of Southern California Study shows that Baby Boomers (1946-1964) have an increased preference for more compact, walkable neighborhoods with a greater sense of community.

• Yankelovich Consultants found that Generation X (1960’s-early 80’s) buyers have a stronger commitment to traditional neighborhood relationships and more highly value sidewalks and nearby recreational facilities.

• A 2002 Housing Preference Study (Atlanta) found that 40% of those surveyed would trade a larger lot for a smaller lot to obtain amenities such as: sidewalks, narrower connected streets, shops & services, parks, and sense of community.
### Another Interesting Case Study

<table>
<thead>
<tr>
<th>Low Density</th>
<th>High Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>191 Acres</td>
<td>191 Acres</td>
</tr>
<tr>
<td>110 Homes</td>
<td>610 Homes</td>
</tr>
<tr>
<td>Average Housing Price $400,000 +</td>
<td>Average Housing Price $185,000</td>
</tr>
<tr>
<td>Zero Public Open Space</td>
<td>75 Acres or 40% of Total</td>
</tr>
<tr>
<td>Zero Schools, Shopping, or Work Locations</td>
<td>Multiple Schools, Shopping, and Work Locations Nearby</td>
</tr>
<tr>
<td>Automobile Use Required 100%</td>
<td>Automobile Use Optional Much of the Time</td>
</tr>
</tbody>
</table>
191 Acres
Consider This

• The Green Housing Movement is Much More Than Building Green Homes

• Energy Demand in The United States is a Runaway Train (Oil Consumption in US is More Than China, Japan & India Combined)

• Do You Really Believe There Will Always be More?
  – Oil
  – Land & Open Space
  – Clean Water

• It is Time For a Paradigm Shift in Wisconsin!