

The slide features a light blue background with wavy patterns and bubbles. A dark grey horizontal band across the middle contains the title and names in white and light blue text. The title 'Water Conservation Pilot Program' is centered in white. Below it, the names 'Nick Marzec', 'Sam Battaglini', and 'Chris Hopman' are listed in light blue, followed by 'Shantel Wyke' and 'Grady Douglas' on the next line.

Water Conservation Pilot Program

Nick Marzec

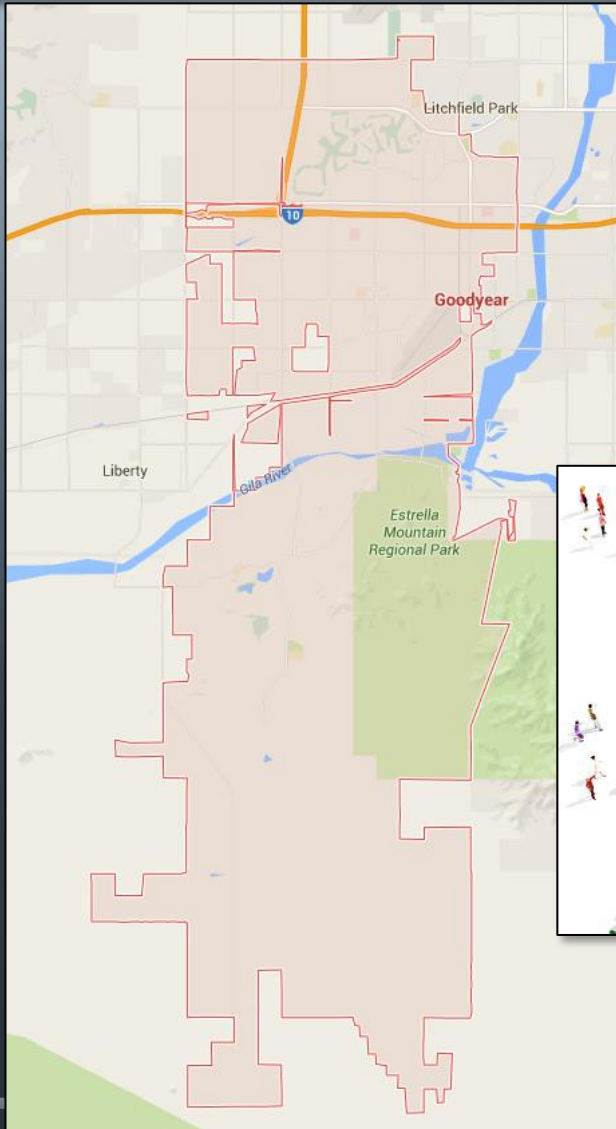
Sam Battaglini

Chris Hopman

Shantel Wyke

Grady Douglas

What is the Problem?



- Significant population growth



Community Partners



- Mark Holmes
 - Water Resources Manager
- Katie Wilken
 - Planning Manager



- Who are we trying to incentivize?
- What is our objective?
- Where have similar problems been solved?

Objective

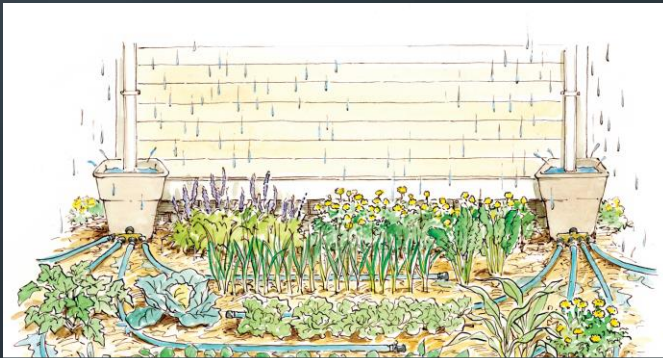
- Reduce or eliminate outdoor water use
 - Target commercial, residential development



totallandscapecare.com



swamplot.com



motherearthnews.com



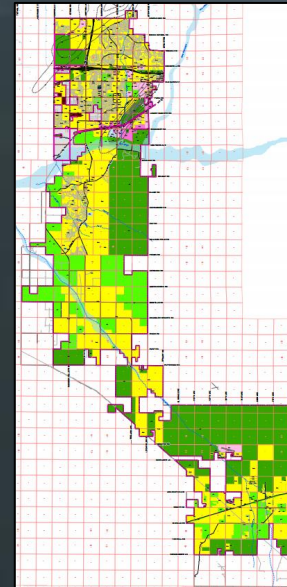
inhabitat.com

Progression

- Started with group interest
 - Water conservation is a pressing issue
- Initial thoughts and ideas
 - Goodyear has a lot of potential
- Provided solutions
 - Voluntary incentive-based pilot program
- Discussing program with Mark
- Preliminary research
 - existing incentive-based programs?
 - Goodyear's master plan?
 - collaboration with other teams

Data Gathering

- Finding program which give specific cost reductions
 - CA, AZ, WA and other states
- Psychological research
 - How will groups respond to particular incentives?
- Specific new development in Goodyear
 - Voluntary incentive-based pilot program



Stakeholders

- City of Goodyear
 - What is the city's master plan?
 - How do we align the program with the city's vision?
 - How can we avoid mandatory curtailment?
- No agricultural water control
 - State controlled irrigation districts
- Home-builders and developers
 - Focus on new development

Incentives

- To mutually benefit 2 or more parties
- How can incentives be effective?
 - Oberlin College
- How might incentives fail?
 - Beloit Corporation
- Why might they fail?
- How can this affect Goodyear?

Incentives

How they *do* and *don't* work

- Pay is not a motivator
- Rewards punish
- Rewards ignore reasons
- Rewards discourage risk taking
- Rewards rupture relationships
- Rewards undermine interest

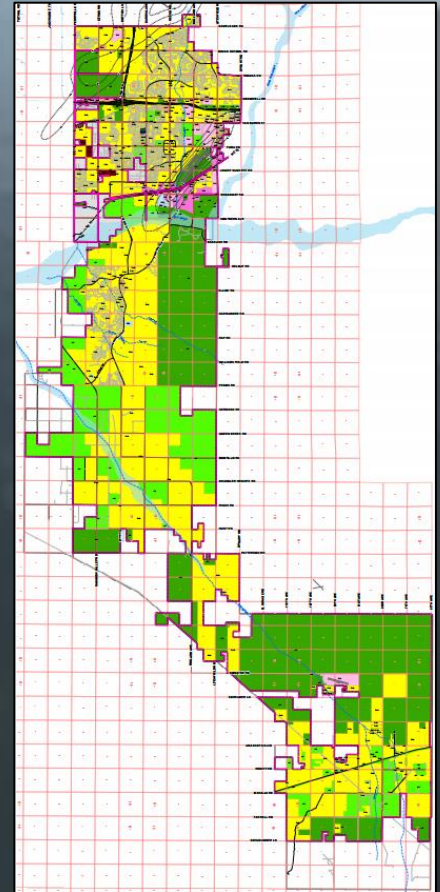


Program Basis

- Thus, we seek to create an incentive program where
 - Developers have freedom in conservation methods
 - Developers are eager to join
 - Holds businesses to Goodyear's guidelines and standards
 - Preserves the importance of water conservation

Lessons Learned

- Goodyear is a large city
 - Vast undeveloped regions
 - Large planned development zones
- Legislation changes are difficult
 - Adapting to change may take time
- Many local counties and cities share Goodyear's goals
 - Curbing water use
 - Maintaining existing supply



Program Structure

- The team selected a point-based system
 - Includes a certification hierarchy
- Inspired by numerous existing systems
- Flexible and dynamic for developers
 - Adjustable scale
 - Expandable actions list
 - Variable incentives

Program Structure








| Methods of Conservation | Points |
|--|------------|
| Use of EPA WaterSense® fixtures | 4 |
| Low water use appliances | |
| -EnergyStar® certified dishwashers (<3gal/cycle) | 4 |
| -EnergyStar® certified clothes washer (WF < 3.2) | 4 |
| Rainwater capture | |
| -Cistern | 4 |
| -Efficient landscape design | 10 |
| -Treated for domestic use | 10 |
| Graywater collection (two pipe drainage) | 6 |
| - Treatment and reuse systems (no outdoors!) | 1 |
| Water heater to faucet distance | |
| - >50% within 20ft | |
| - 100% within 20ft | |
| Paved off-street surfaces are permeable | 12 |
| -Rainfall is captured as runoff | |
| Xeriscaping (100%, excluding vegetable/fruit) | |
| -No irrigation required (some exclusions) | 1 |
| -Minimized lawn area | |
| - <30% of lot size | 2 |
| - <15% of lot size | 4 |
| - 0% of lot size | 8 |
| -Detached sidewalks with no-water-use planting | 8 |
| Irrigation rain sensing shutoff | 4 |
| Open space | |
| -Natural open space features preserved | 8 |
| -Storm water retention is integrated into open space | 12 |
| TOTAL | 137 |

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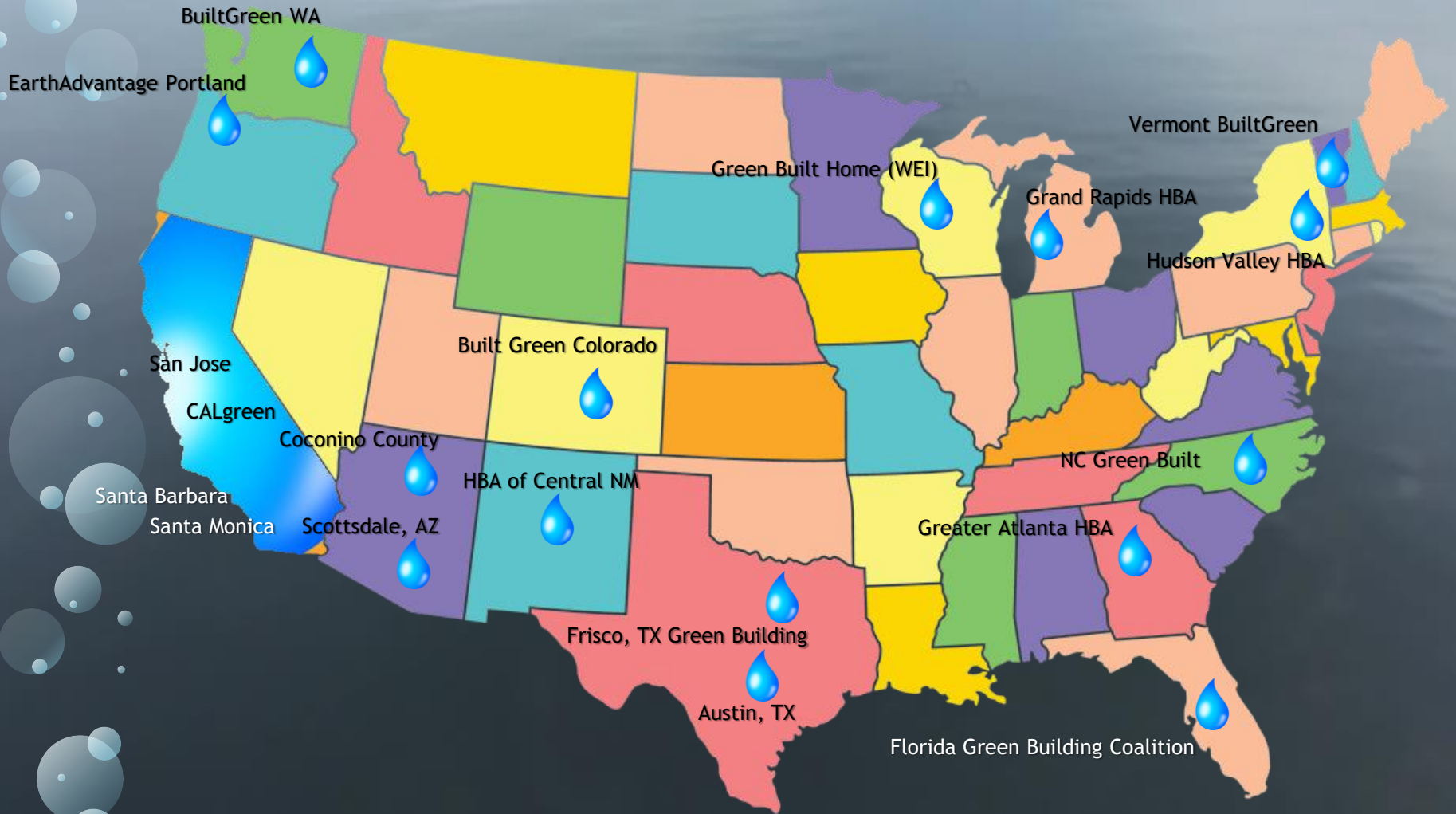
Why Points

- Numerous organizations, cities, and states use this concept
- LEED:

| LEED v4 for Building Design and Construction: Homes and Multifamily Lowrise | | Project Checklist | | Project Name: | |
|---|--------------------------|--------------------------|-------------------------------------|--|-----------|
| | | | | Date: | |
| Y | ? | N | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Integrative Process | 2 |
| 0 | 0 | 0 | Location and Transportation | | 15 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Floodplain Avoidance | Required |
| PERFORMANCE PATH | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | LEED for Neighborhood Development Location | 15 |
| PRESCRIPTIVE PATH | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Site Selection | 8 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Compact Development | 3 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Community Resources | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Access to Transit | 2 |
| 0 | 0 | 0 | Sustainable Sites | | 7 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Construction Activity Pollution Prevention | Required |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | No Invasive Plants | Required |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Heat Island Reduction | 2 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Rainwater Management | 3 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Non-Toxic Pest Control | 2 |
| 0 | 0 | 0 | Water Efficiency | | 12 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Water Metering | Required |
| PERFORMANCE PATH | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Total Water Use | 12 |
| PRESCRIPTIVE PATH | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Indoor Water Use | 6 |
| EA PRESCRIPTIVE PATH (continued) | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Heating & Cooling Distribution Systems | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Efficient Domestic Hot Water Equipment | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Lighting | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | High Efficiency Appliances | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Renewable Energy | |
| 0 | 0 | 0 | Materials and Resources | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Certified Tropical Wood | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Durability Management | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Durability Management Verification | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Environmentally Preferable Products | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Construction Waste Management | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Material Efficient Framing | |
| 0 | 0 | 0 | Indoor Environmental Quality | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Ventilation | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Combustion Venting | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Garage Pollutant Protection | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Radon-Resistant Construction | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Air Filtering | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Environmental Tobacco Smoke | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prereq | Compartmentalization | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Credit | Enhanced Ventilation | |

| | |
|---|---|
|  | Outdoor water use reduction Water efficiency Prerequisite Required |
|  | Indoor water use reduction Water efficiency Prerequisite Required |
|  | Building-level water metering Water efficiency Prerequisite Required |
|  | Outdoor water use reduction Water efficiency Credit Up to 2 points |
|  | Indoor water use reduction Water efficiency Credit Up to 6 points |
|  | Cooling tower water use Water efficiency Credit Up to 2 points |
|  | Water metering Water efficiency Credit 1 point |

Why Points?



Program Structure



Permitting process expedited
City-sponsored certification and recognition



Water connection charges reduced or eliminated
Design review process expedited



Density bonuses: 10%+ above zoning
Open space requirements reduced
Hourly inspection fees reduced



Must obtain LEED certification for homes
Permitting fees reduced
City reduces property valuations for fees and taxes

Program Structure

- Outdoor water usage is high
 - >70% of domestic municipal use
- To better aim incentives, we need to know more
 - Lawns
 - Trees & shrubs
 - Pools
 - Gardens
- Goodyear should investigate further
 - Compare traditional and xeriscaped homes
 - Inefficient irrigation

Unknown Quantities

- Goodyear has no incentive-based conservation programs
 - Existing programs are educational, voluntary
- Limits local data on incentive efficacy
- Cost benefit analysis
 - Very little quantitative data
 - No fee or tax information



Necessary to Progress

Detailed financial data

- More extensive research
 - Taxes
 - Fees
 - Other development costs
- What financial burdens can the city accept?
 - Long-term reductions in fee uptake
 - Fronting costs

Necessary to Progress

- Cost-Benefit Analysis
 - Financial Data
- Metrics for Success
 - Average Household Water Use
 - Developer Participation
 - Quantity of certified developments