



Planning Water-wise Communities in the West

Sustaining Colorado Watersheds Conference

Clark Anderson, Colorado Director
The Sonoran Institute



Shaping the Future of the West

October 4, 2011

Shaping the Future of the West

The Sonoran Institute inspires and enables community decisions that respect the land and the people of the West.



healthy landscapes • vibrant economies • livable communities

Click to edit Master text styles
Second level

Third level
Fourth level

Fifth level

Building Water-wise Communities Past, Present and Future



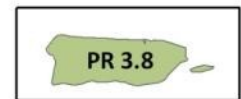
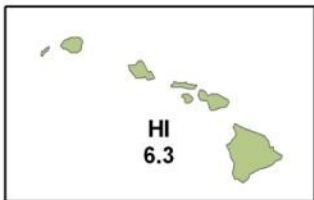
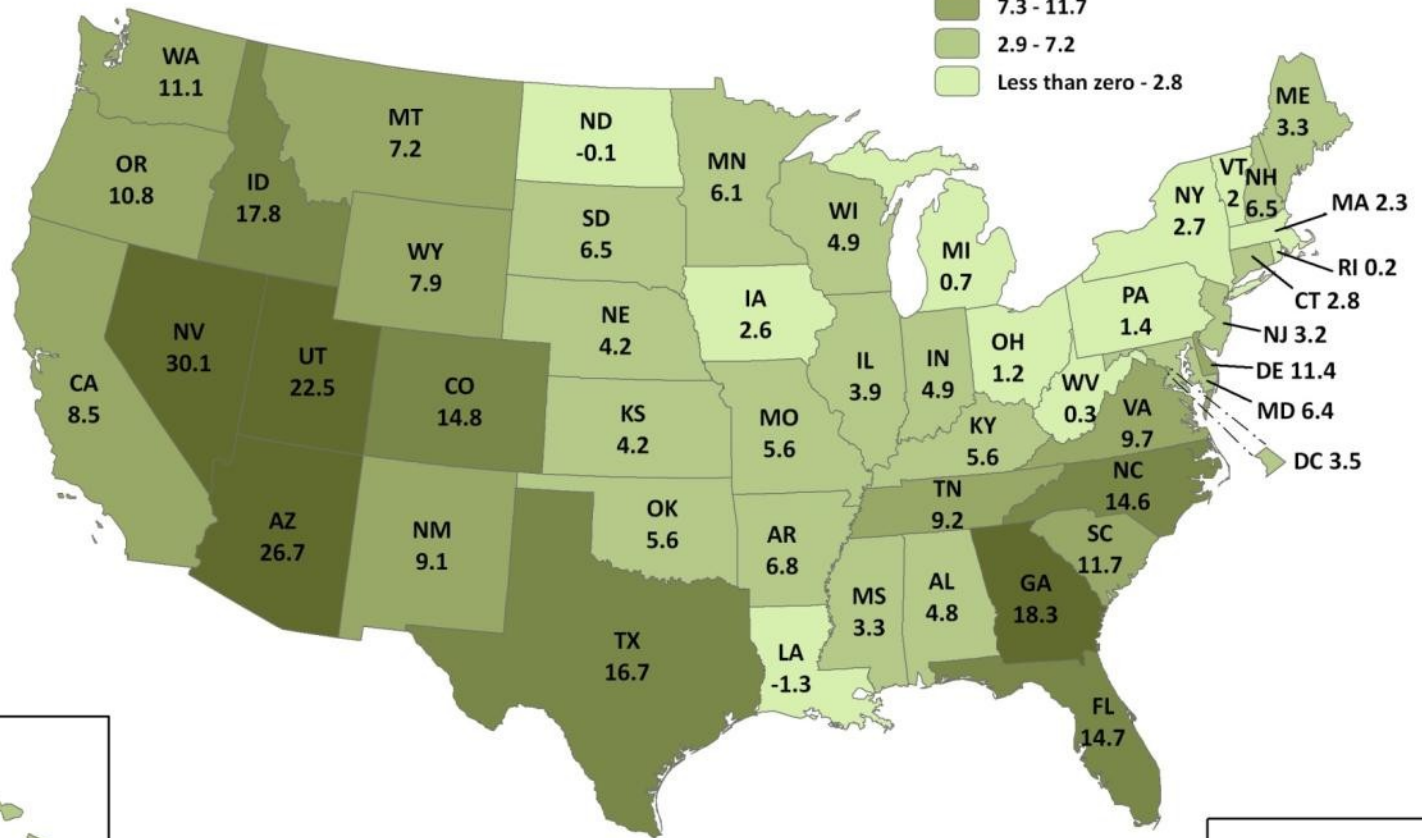
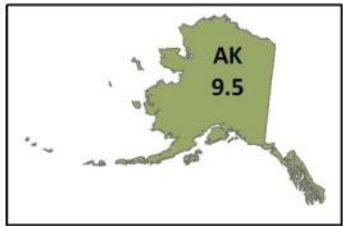
Western States Population Growth 1940 - 2025



Projected

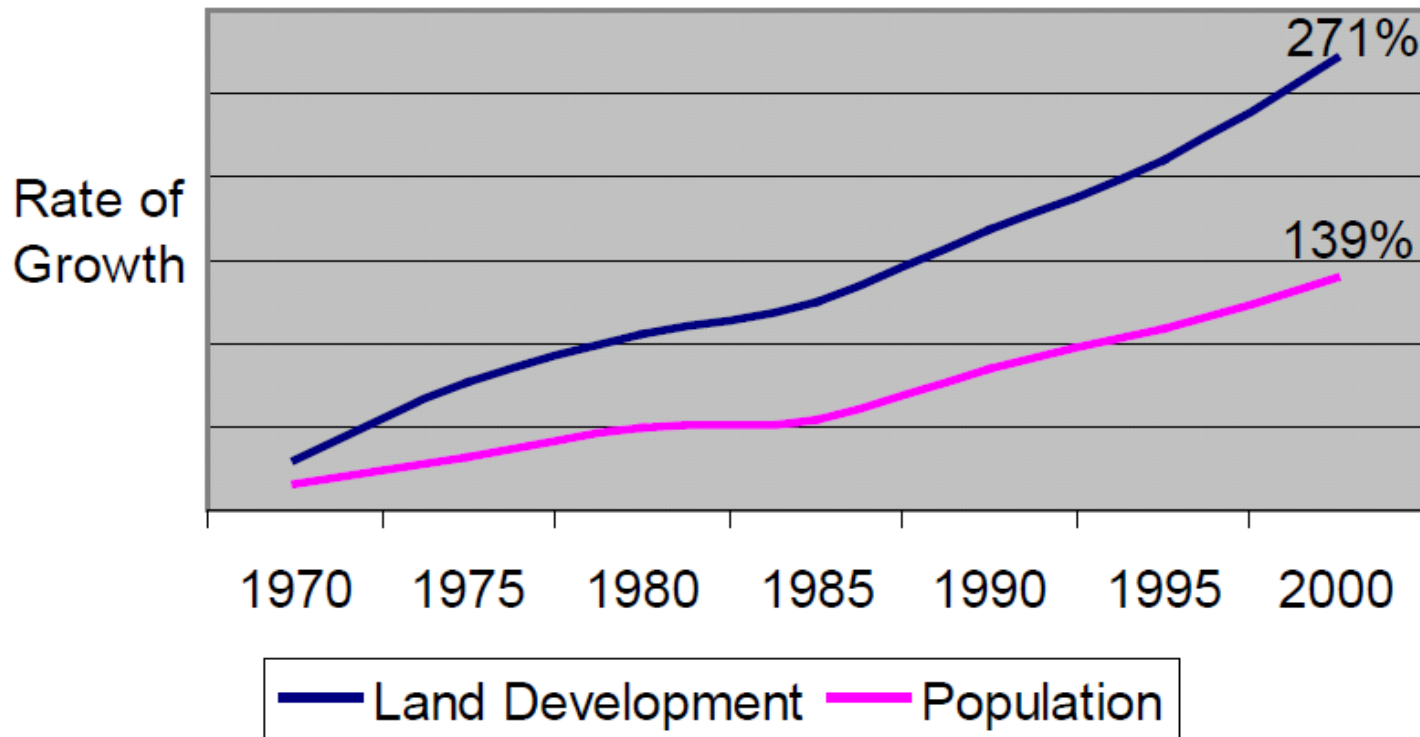
Western States - Fastest Growing Region in the US

Percent Change in Resident Population for the 50 States, the District of Columbia, and Puerto Rico: 2000 to 2008



How we've been growing matters most

Population Growth and Land Development



Growth at the edge



Low density residential



©2008 Google

Image USDA Farm Service Agency

39°39'39.17" N 106°32'33.19" W elev 2493 m

Imagery Dates: Sep 2004 - Jun 17, 2005

Eye alt 5.41 km

Single use residential



Image USDA Farm Service Agency
Image © 2009 DigitalGlobe
Image U.S. Geological Survey

2009 Google

Imagery Date: Jul 31, 2007

39°51'59.97" N 105°00'39.43" W elev 5374 ft

Eye alt 9442 ft

Commercial strips



Big box commercial



2003 Google

Image USDA Farm Service Agency

39°37'39.61" N 106°29'58.23" W elev 2302 m

Eye alt 4.21 km

Imagery Date: Sep 2004

Car habitat



Car habitat



Car Habitat



Development Patterns



Image USDA Farm Service Agency
Image © 2009 DigitalGlobe
Image U.S. Geological Survey

2009 Google

Development Patterns

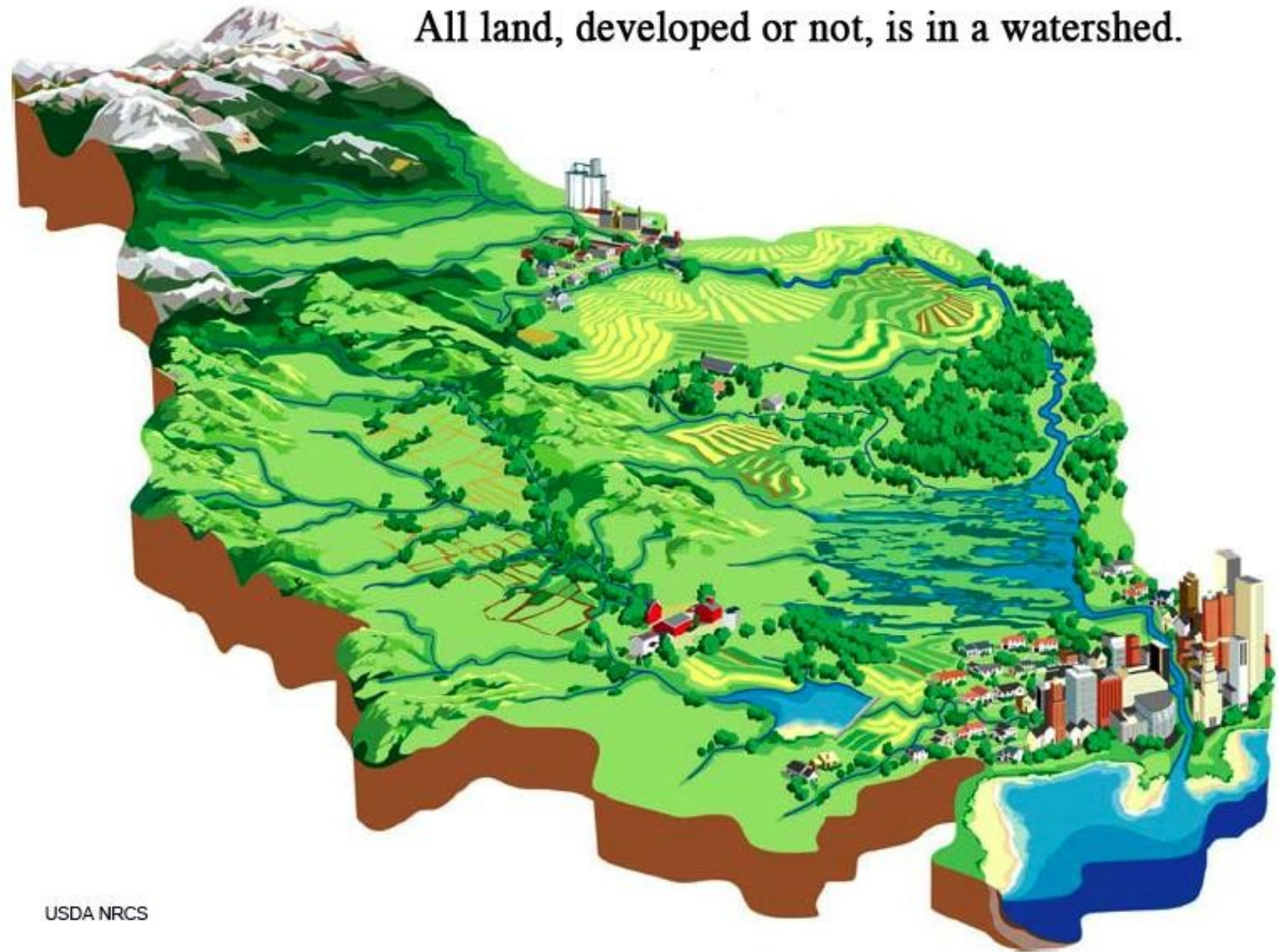


Development Patterns



So what?

All land, developed or not, is in a watershed.



Natural Infrastructure



What happens....

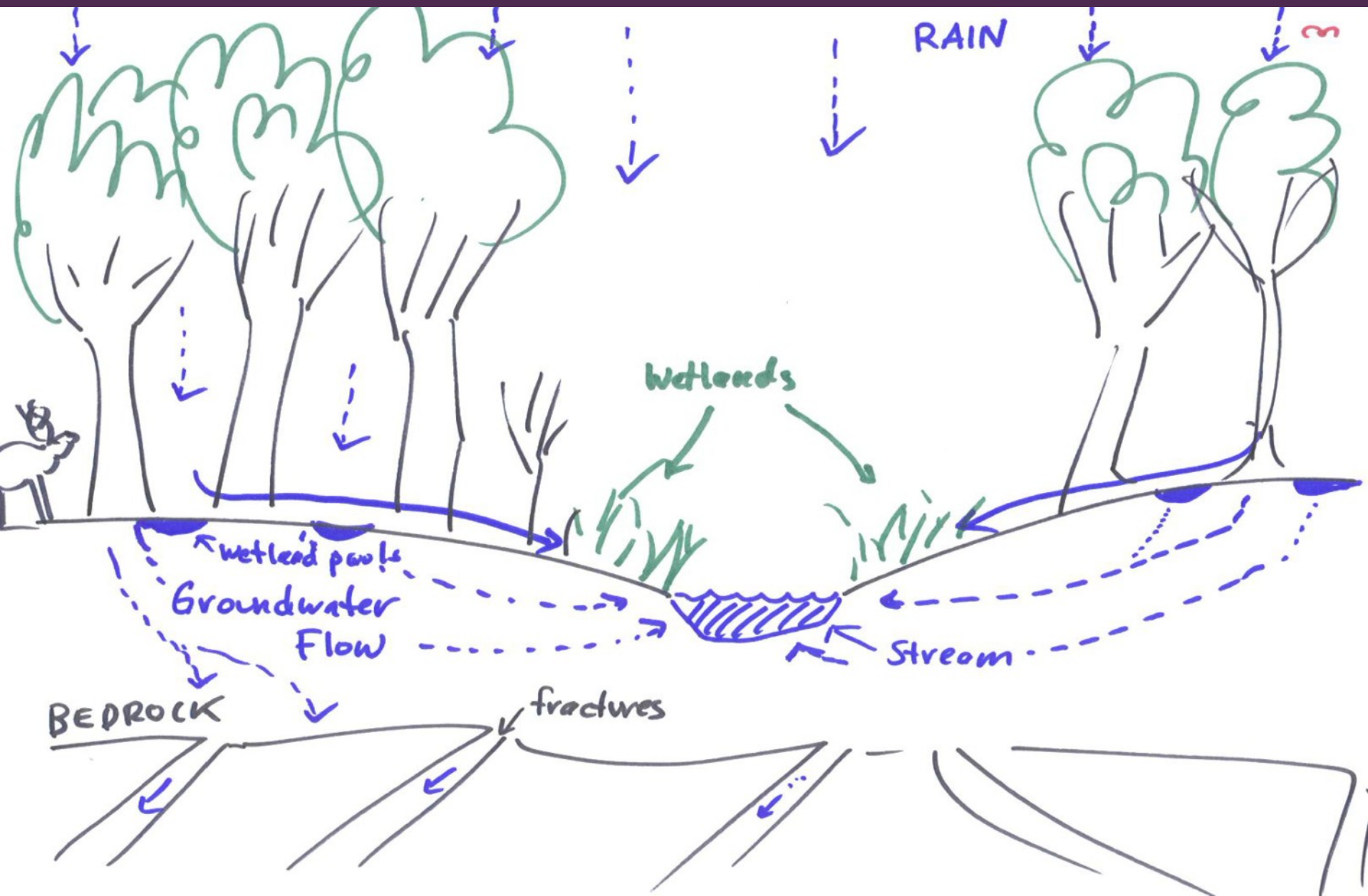
When we go from this...



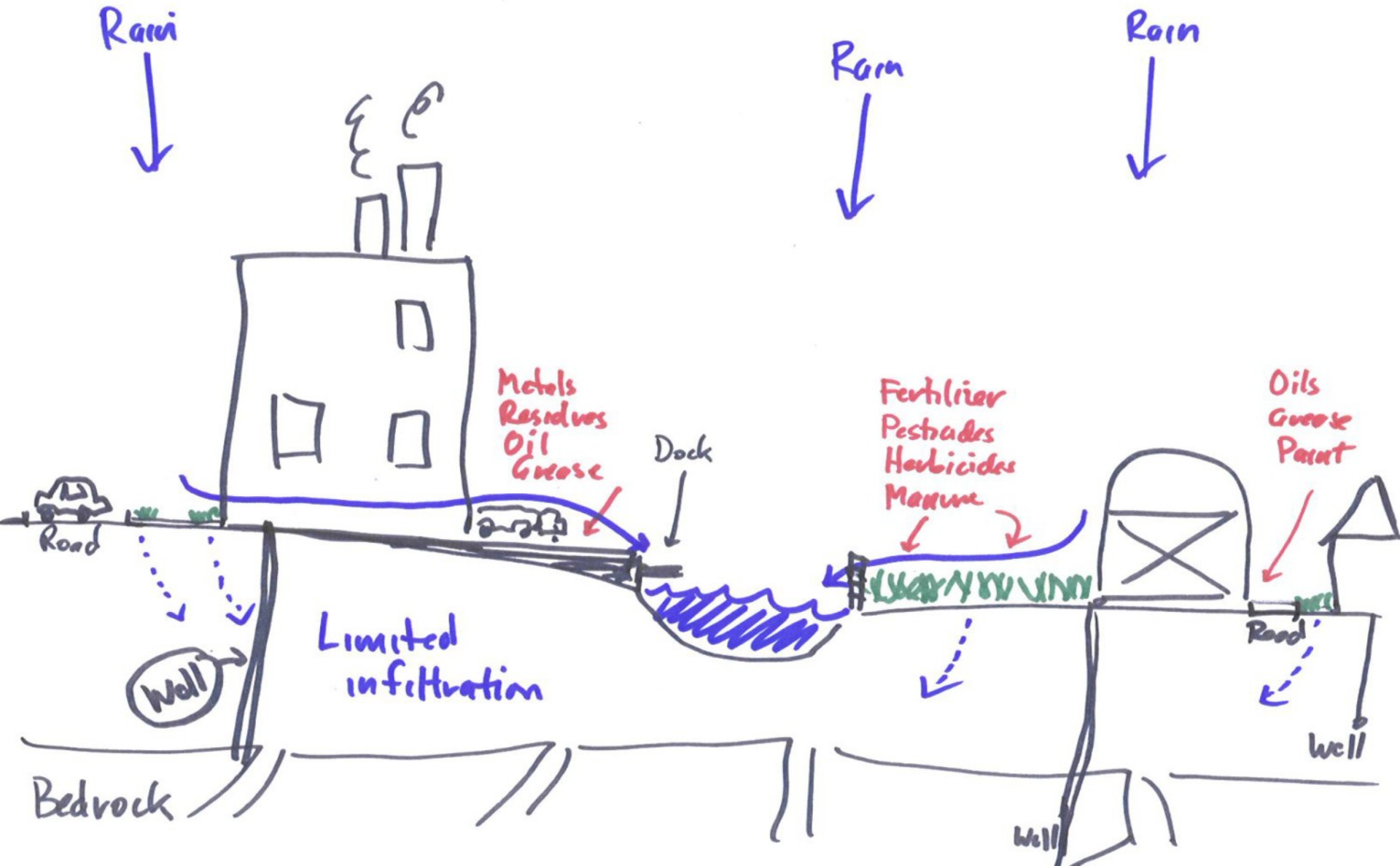
To this?



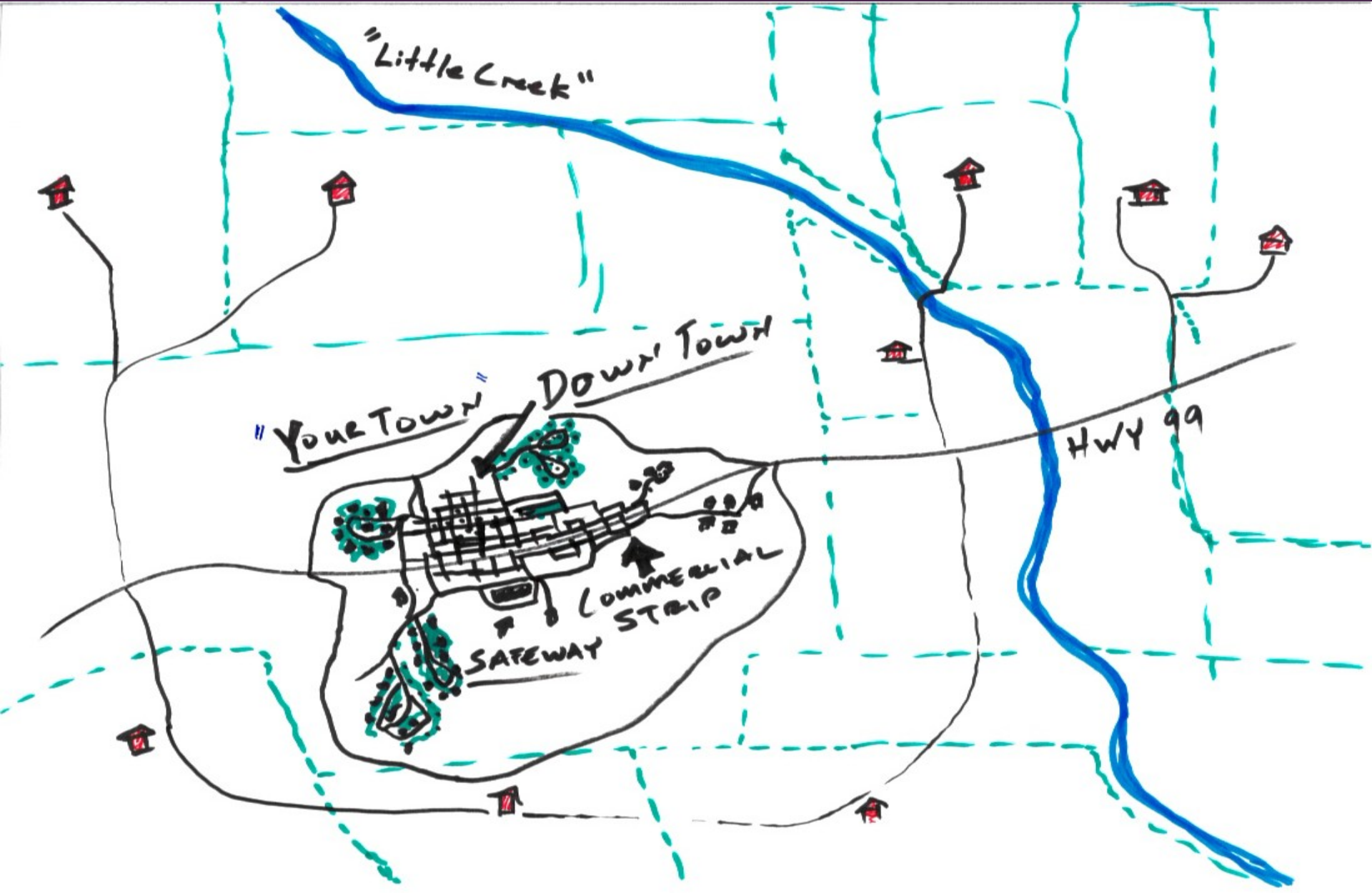
Before



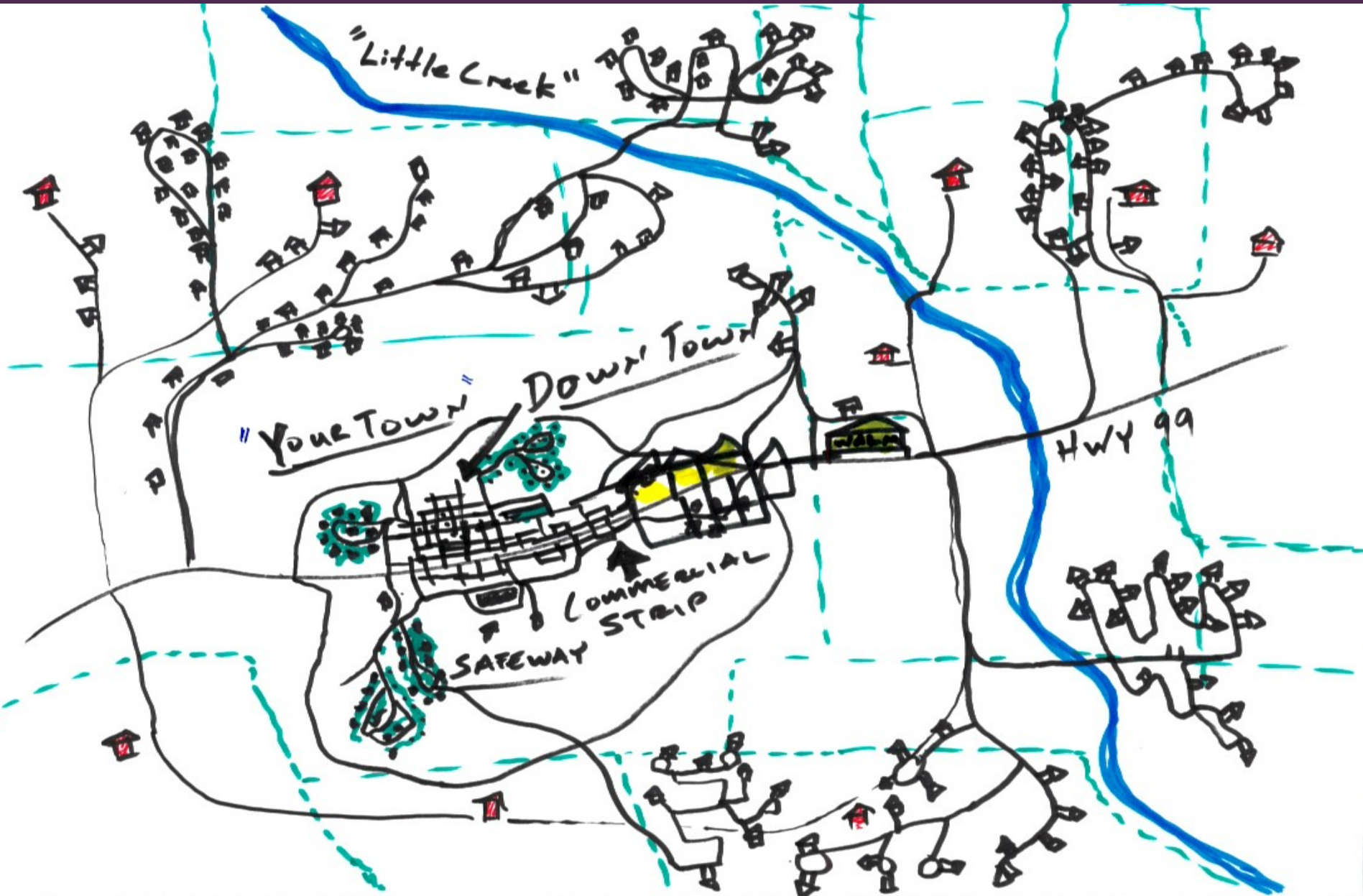
After



Yourtown USA



Yourtown USA



How we are growing
threatens the water we need



Water quality implications...

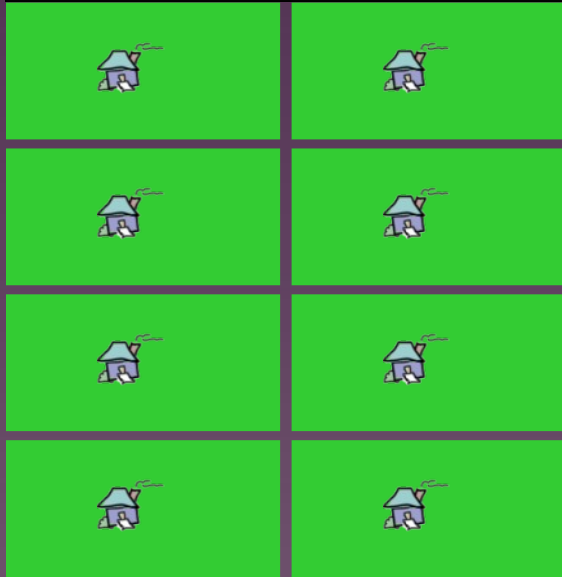


- More impervious cover
- Increased runoff and flooding
- Erosion, sedimentation
- Loss of habitat
- Non-point source pollution



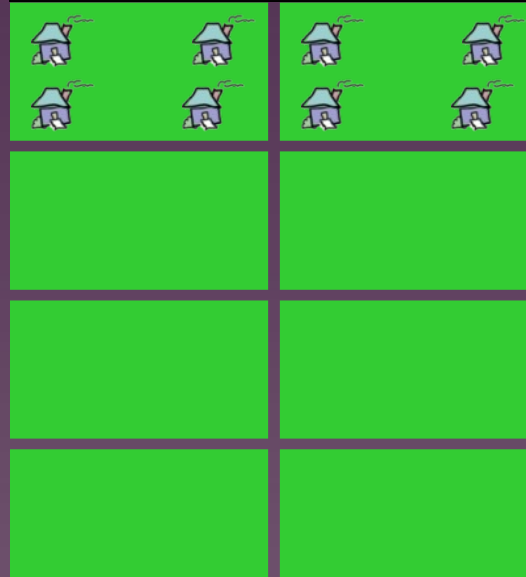
Water quality implications: Accommodating 8 units on 8 acres

**Scenario A:
1 unit/acre**



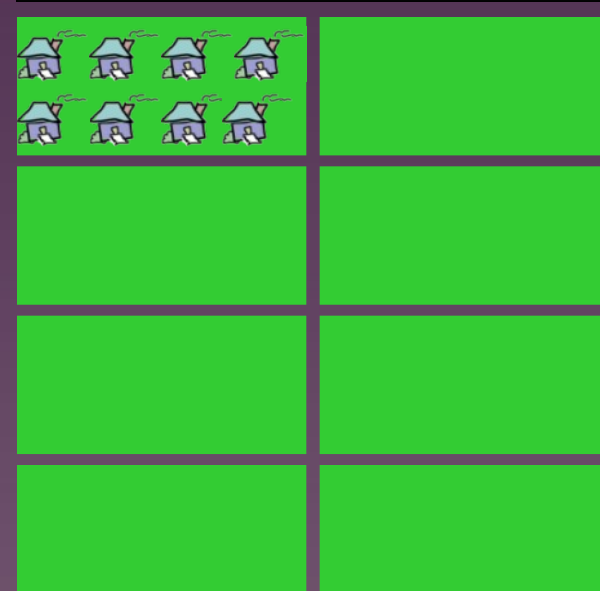
Impervious c = **20%**
Tot. runoff = **149,600 ft³/yr**
Runoff/house = 18,700 ft³/yr

**Scenario B:
4 units/acre**



Impervious cover = **38%**
Total runoff = **49,600 ft³/yr**
Runoff/house = **6,200 ft³/yr**

**Scenario C:
8 units/acre**



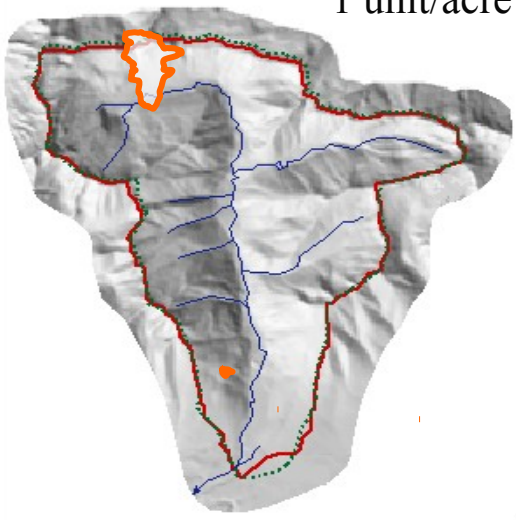
Impervious cover = **65%**
Total runoff = **39,600 ft³/yr**
Runoff/house = **4,950 ft³/yr**

The lower density scenario creates more run-off and consumes more land than the higher density scenario.

Watershed Impacts

Accommodating 10,000 units at different densities

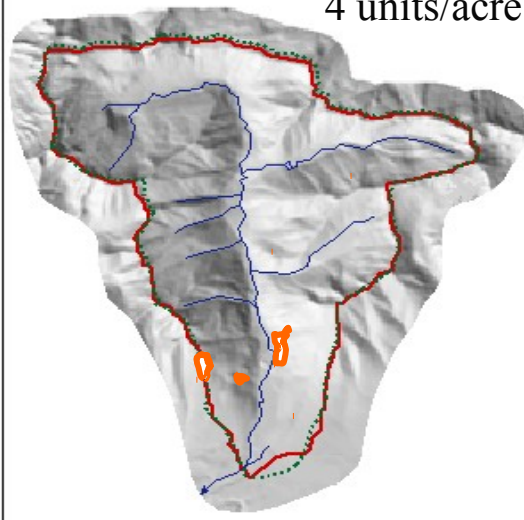
1 unit/acre



10,000 new houses on
10,000 acres produce
187 million ft³ /yr
stormwater runoff

Site: 20% impervious
Watershed: 20%
impervious

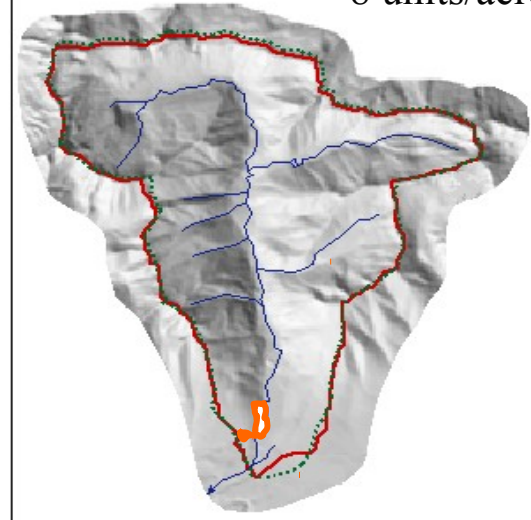
4 units/acre



10,000 new houses on
2,500 acres produce
62 million ft³ /yr
stormwater runoff

Site: 38% impervious
Watershed: 9.5%
impervious

8 units/acre



10,000 new houses on
1,250 acres produce
49.5 million ft³ /yr
stormwater runoff

Site: 65% impervious
Watershed: 8.1%
impervious

The lower density scenario consumes 2/3 more land than the higher density scenario

Water supply implications:

Increased Demand on Supplies

- Large lots increase water demand
- Bigger lawns use more water

Utah study: per capita use dropped 50% by going from 2 – 5 units / acre

Seattle study: 67% increase in density (from 4 – 12 units/acre) resulted in 60% decrease in water use

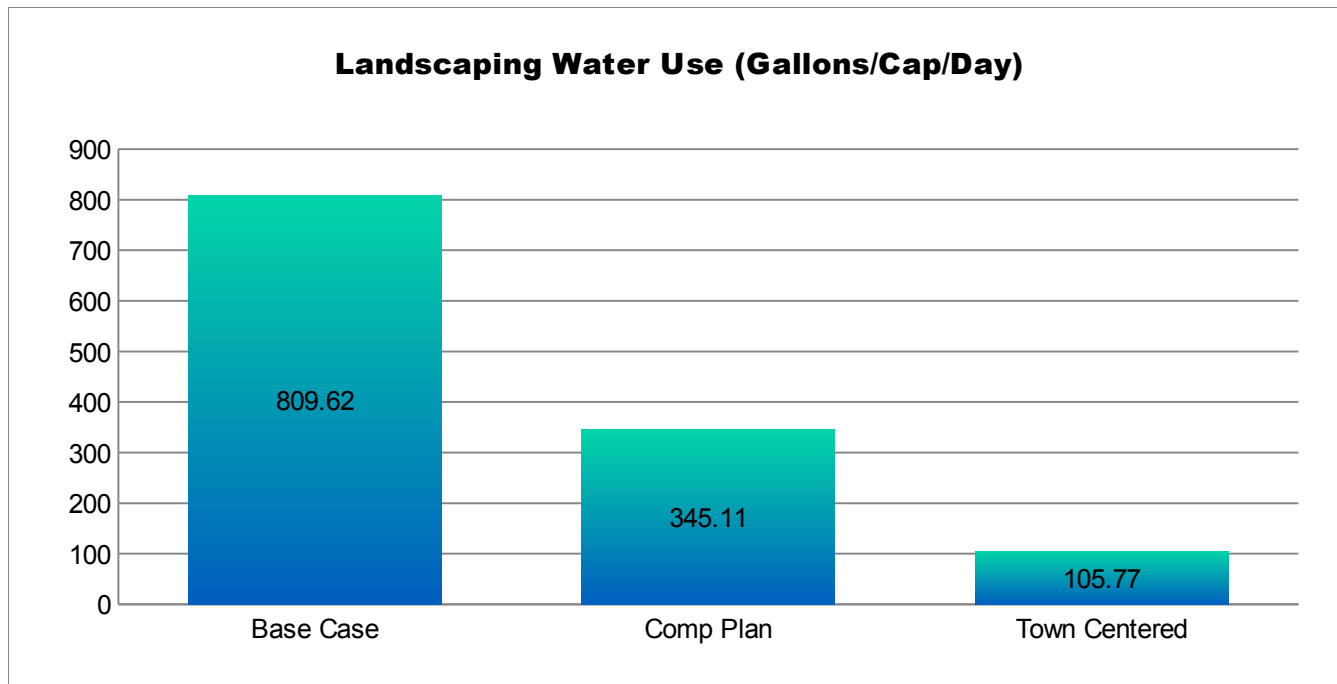


Landscaping Water Use

57% reduction from Base Case to Comp Plan

87% reduction from Base Case to Town Centered

Every square foot of green lawn needs 0.1 gallons of water per day – it's a huge water consumer



Water infrastructure implications:

- Longer transmission lines mean more leakage
- Costly to extend delivery / sewer systems
- Greater reliance on wells and septic systems
- Deferred investment/maintenance in existing systems



Paving over watersheds



Infrastructure Nightmare...

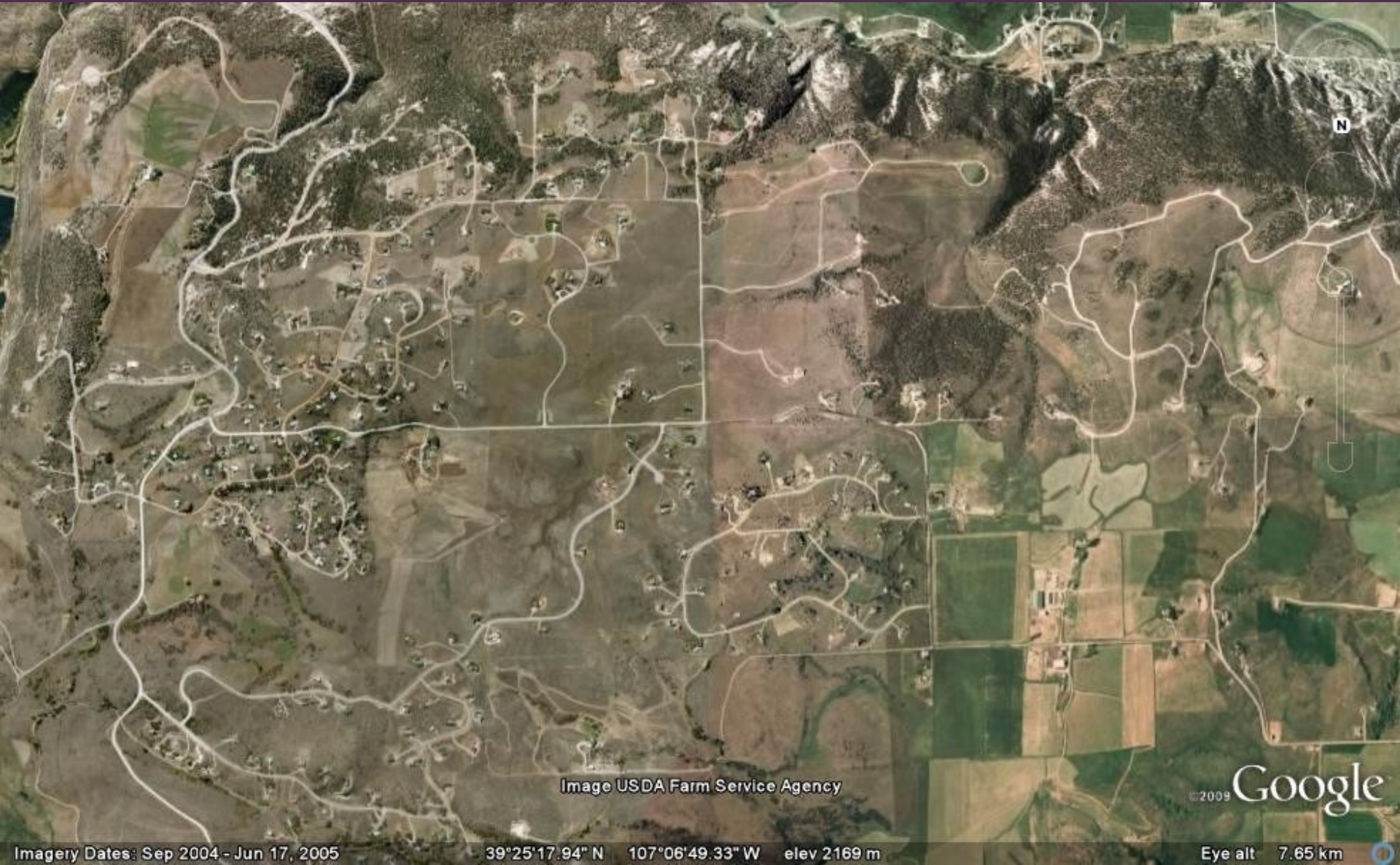


Image USDA Farm Service Agency

©2009 Google

Imagery Dates: Sep 2004 - Jun 17, 2005

39°25'17.94" N 107°06'49.33" W elev 2169 m

Eye alt 7.65 km

Using water inefficiently



...and losing the “Good Stuff”



Why are we growing like this?

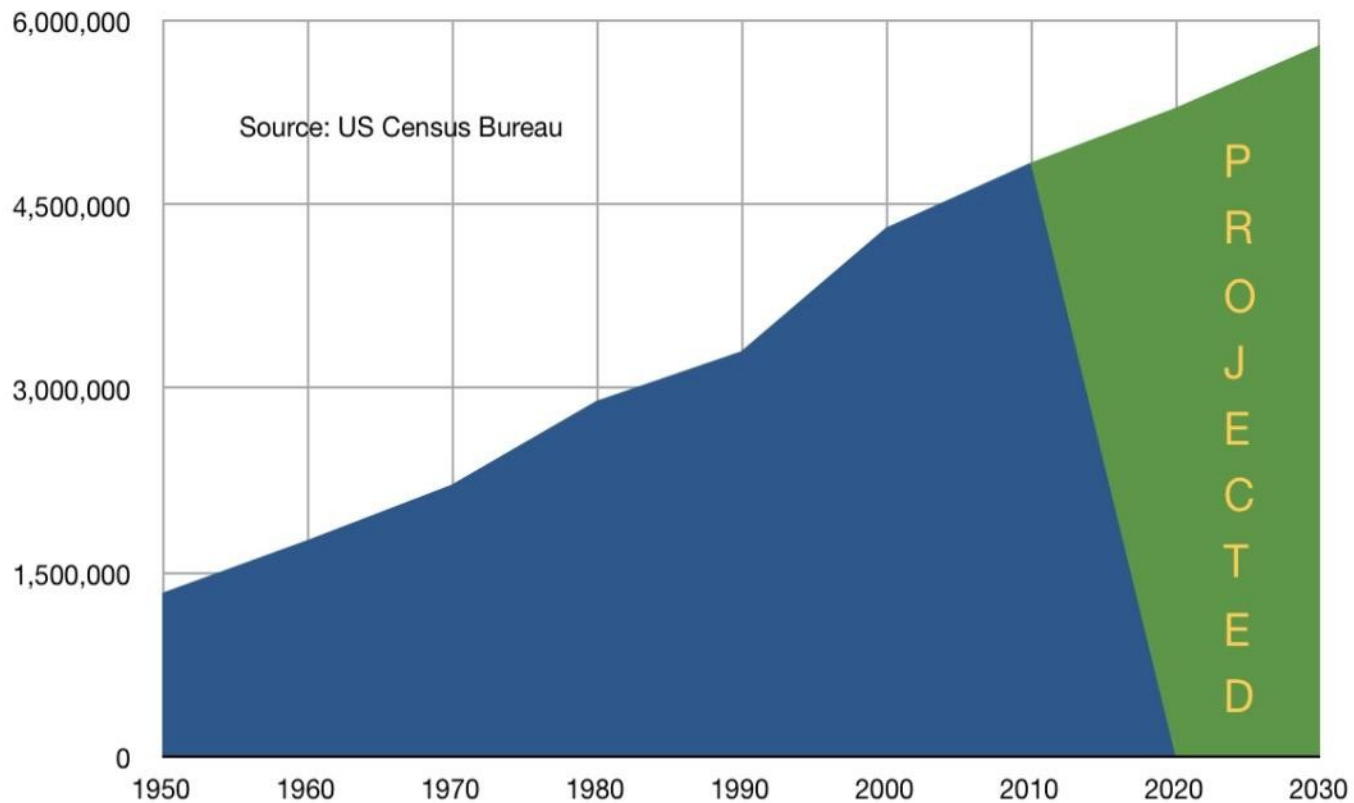


Image USDA Farm Service Agency

©2008 Goo

SUSPECT: Growth

Colorado Population, 1950-2030 (projected)



SUSPECT: Developers!



SUSPECT: The NIMBY's



**SUSPECT:
Elected Leaders?**



SUSPECT: Planners



SUSPECT: Engineers



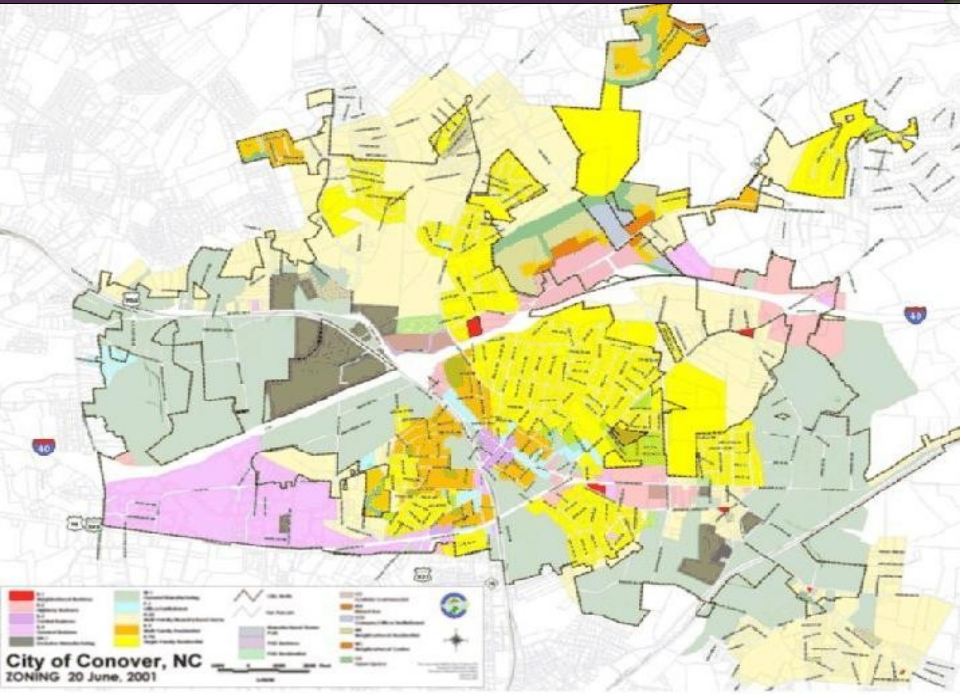
SUSPECT: Environmentalists?



SUSPECT: Cars



We are getting what we plan for...



Outmoded zoning and transportation investments
are fueling inefficient growth...

We have been planning for our cars





...not people



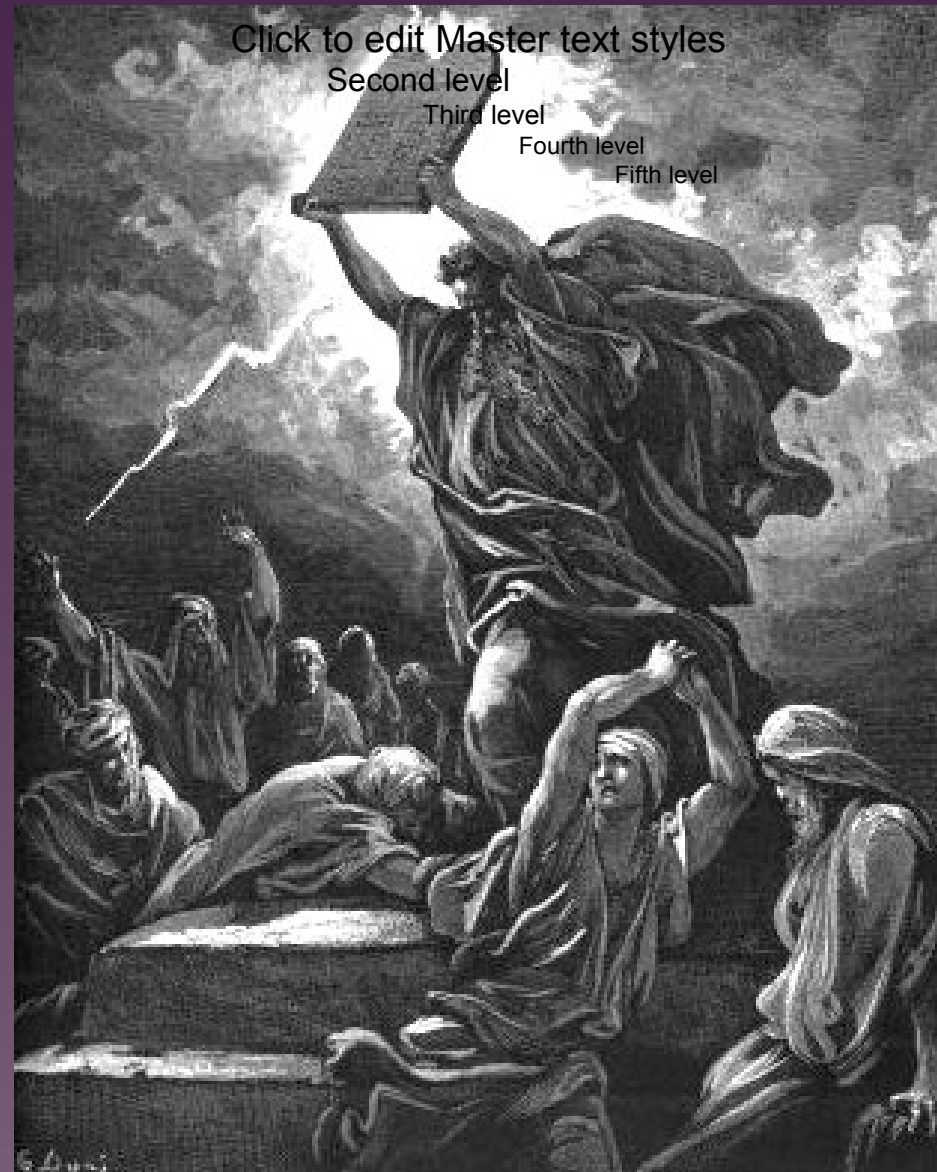
...nor water

What our zoning codes give us



Breaking the Code!

Retool policies to encourage what we want and discourage inefficient development patterns...



Market



Forces


The game has changed...



Rapid growth in the West helped fuel a monumental "bust."

Far-flung Sub-divisions are Faring Worse than In-town Development



An aerial photograph of a large residential subdivision. The landscape is green with many winding roads and several small ponds. Many of the lots appear to be vacant, with some houses visible but many empty spaces. The overall scene suggests a large-scale housing project that is not fully occupied.

Foreclosures and Obsolete Subdivisions Clogging the Market

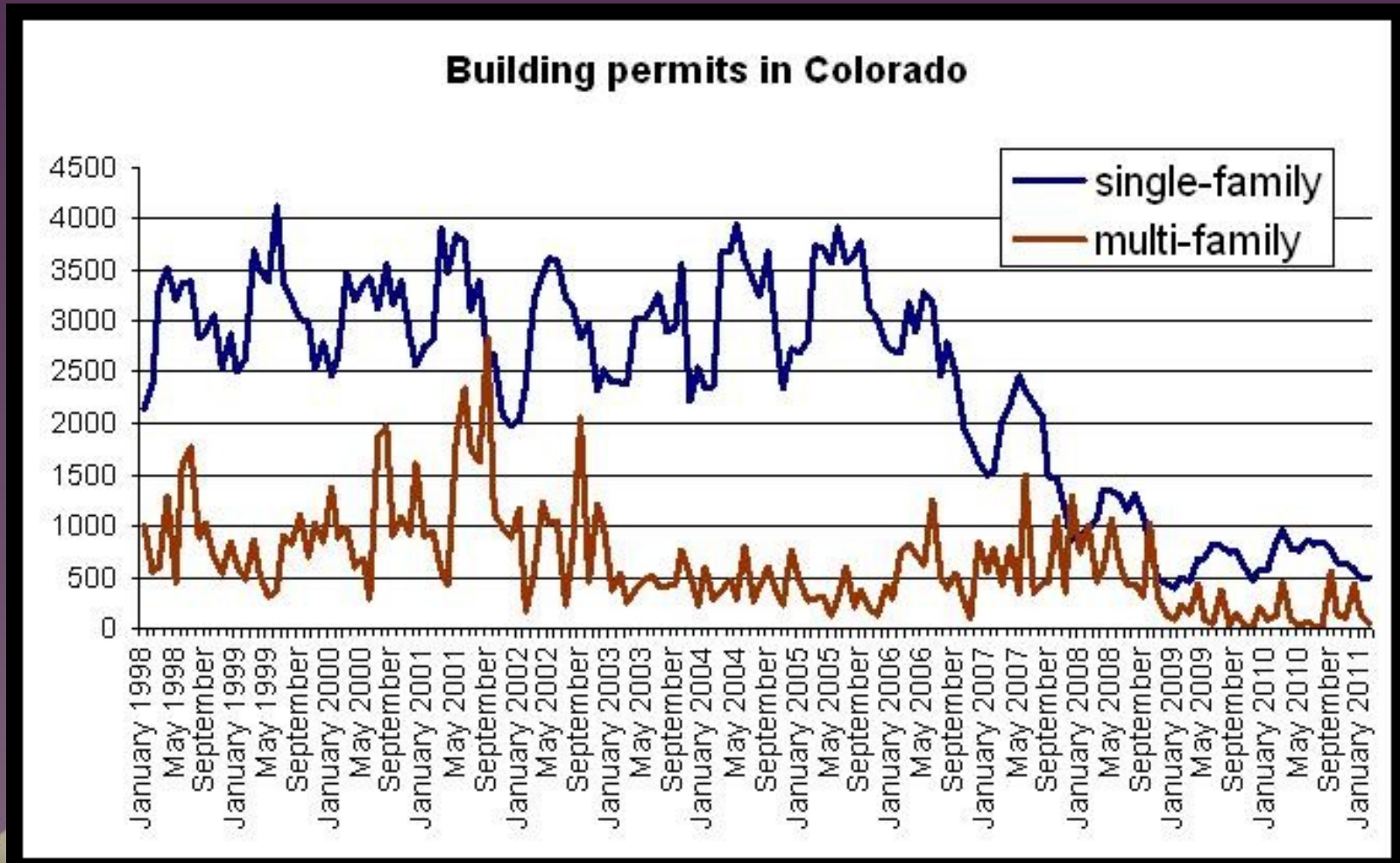
Teton County, ID: estimated 75% of approved home lots vacant, sufficient for 4X population, and almost \$250 million in foreclosed real estate.
Arizona: Over a million approved - but vacant - housing lots

Changing Circumstances:

The worst housing market in 75 years
Need to be proactive to succeed



Changing Circumstances: Single Family Construction Decreases More Dramatically Than Multi-Family



A Changed Housing Market is Emerging

People will seek to live in housing that they can afford; housing costs will be more directly tied to income.

Demand for traditional single family housing will fall and demand for townhomes and multi-family will rise.

Renting will be more appealing to many households – and these households will demand high quality rental options

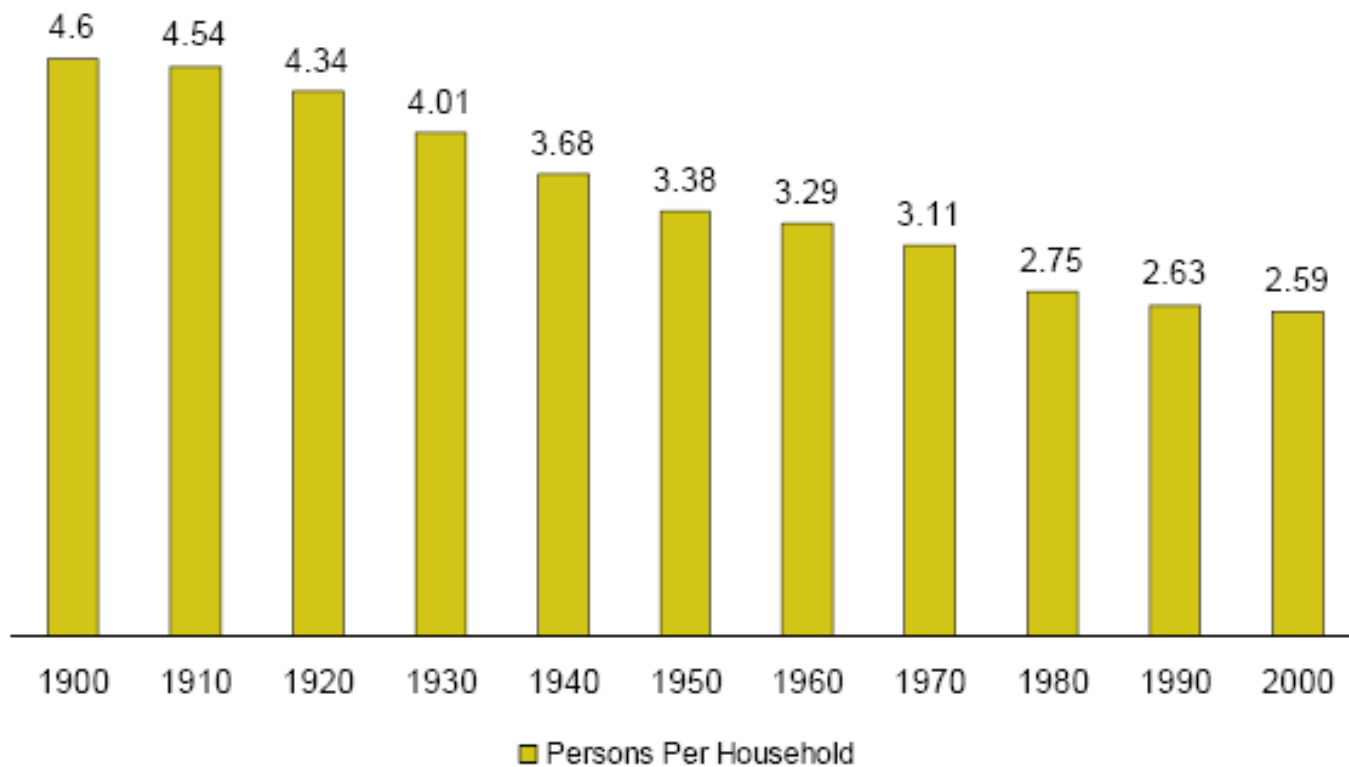


Where are we headed?



- University of Utah
- National Association of Realtors
- National Association of Home Builders

Smaller Households



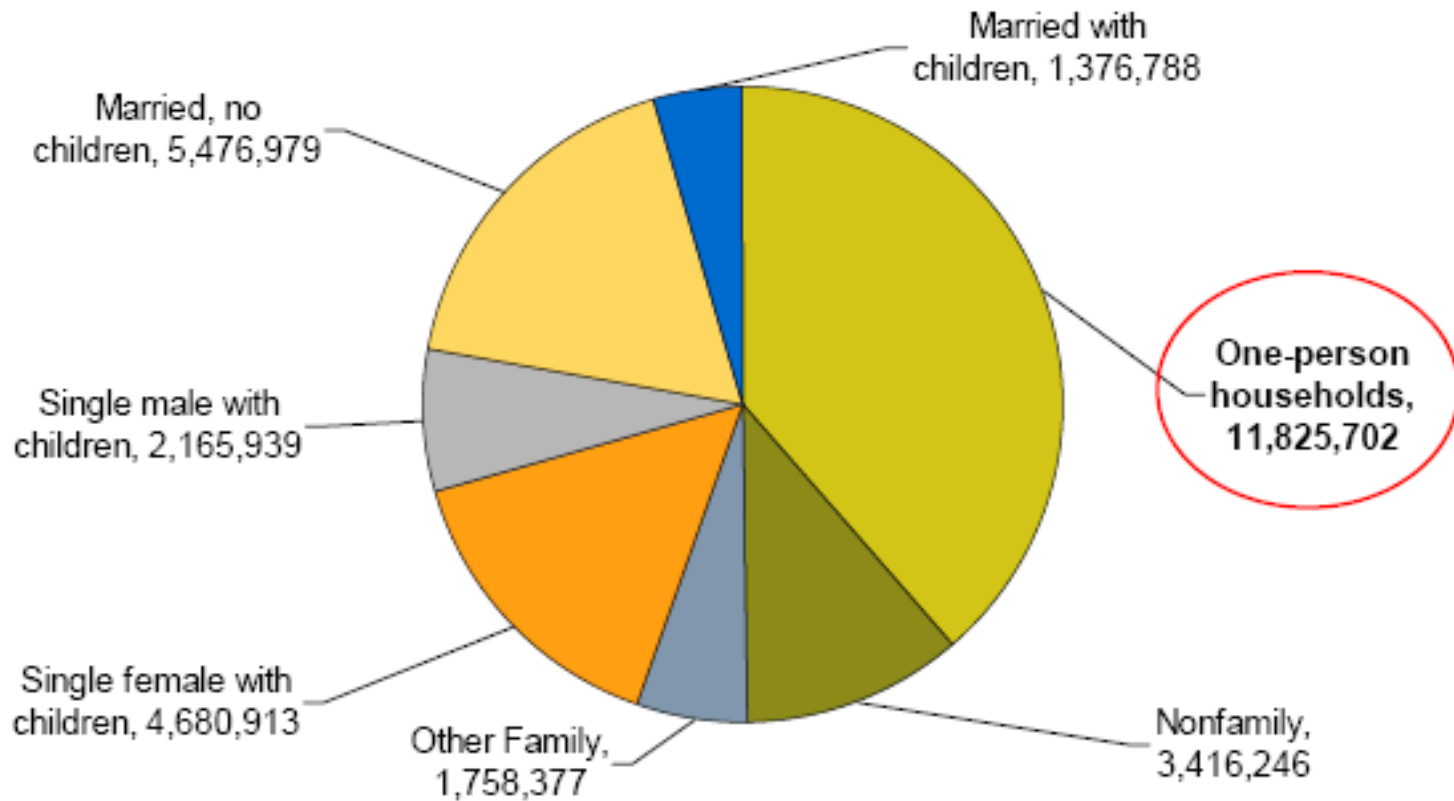
SOURCE: US Census

Source: RCLCO

Single Person Households Leading the Way

85% growth in households w/o children

**Absolute Change in Households, United States
1980–2000**



Who is the future market? (hint, its not just the boomers...)

GEN Y MAKES UP
THE LARGEST
SHARE OF U.S.
POPULATION,
FOLLOWED BY
BOOMERS, &
GEN X

GENERATION	BORN	2009 AGE (year-end)	% OF NATION	EST. # OF PEOPLE
Eisenhowers	Before 1946	64+	17%	51M
Baby Boomers	1946 – 1964	45 – 63	27%	75M
Generation X	1965 – 1978	31 – 44	18%	52M
Gen Y	1979 – 1996	13 – 30	27%	80M
Gen Z?	1996 and After	0 – 12	10%	30M

Source: RCLOC

SOURCE: Claritas, National Center for Health Statistics, RCLCO

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Retirees: Location Preference

Second level

Third level

Fourth level

Fifth level

City or suburb close to a city: 51%

Suburb away from a city 19%

Rural community 30%

Conventional suburbs away from cities are the least desirable for this group.

Where do your kids want to live?

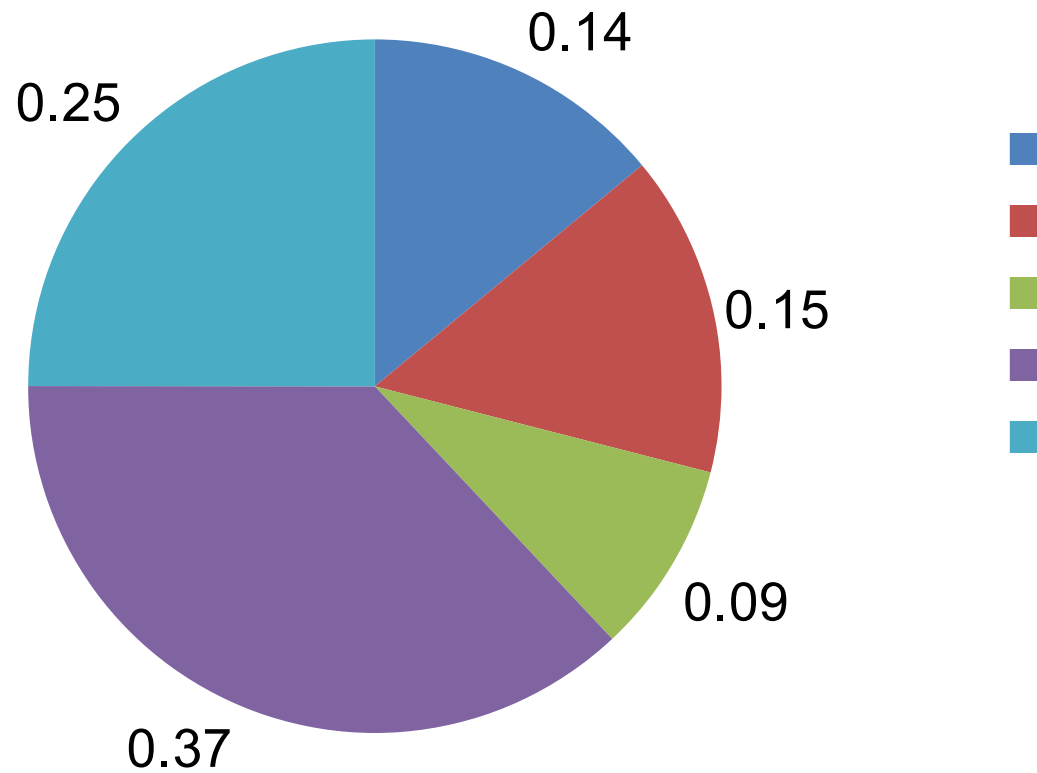


RCLCO Consumer Survey

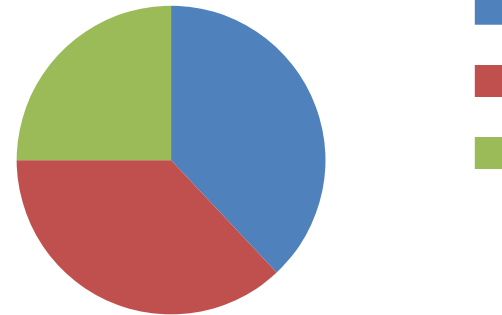
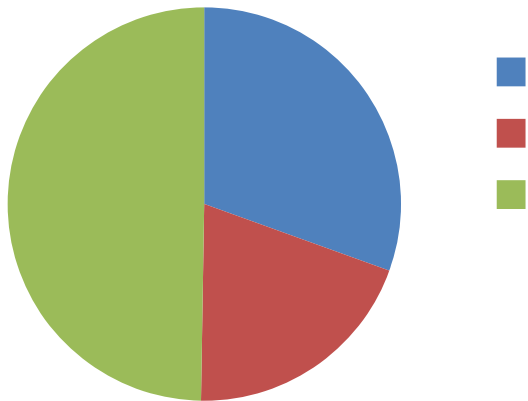
**Desire for convenience, connectivity,
healthy work-life balance**

- **1/3 will pay more for housing walkable to shops, work, and entertainment**
- **2/3 say living in a walkable community is very important to their location decision**
- **1/2 would trade lot size for proximity to shopping or to work**
- **1/3 willing to trade lot size and “ideal” homes for walkable, diverse communities**

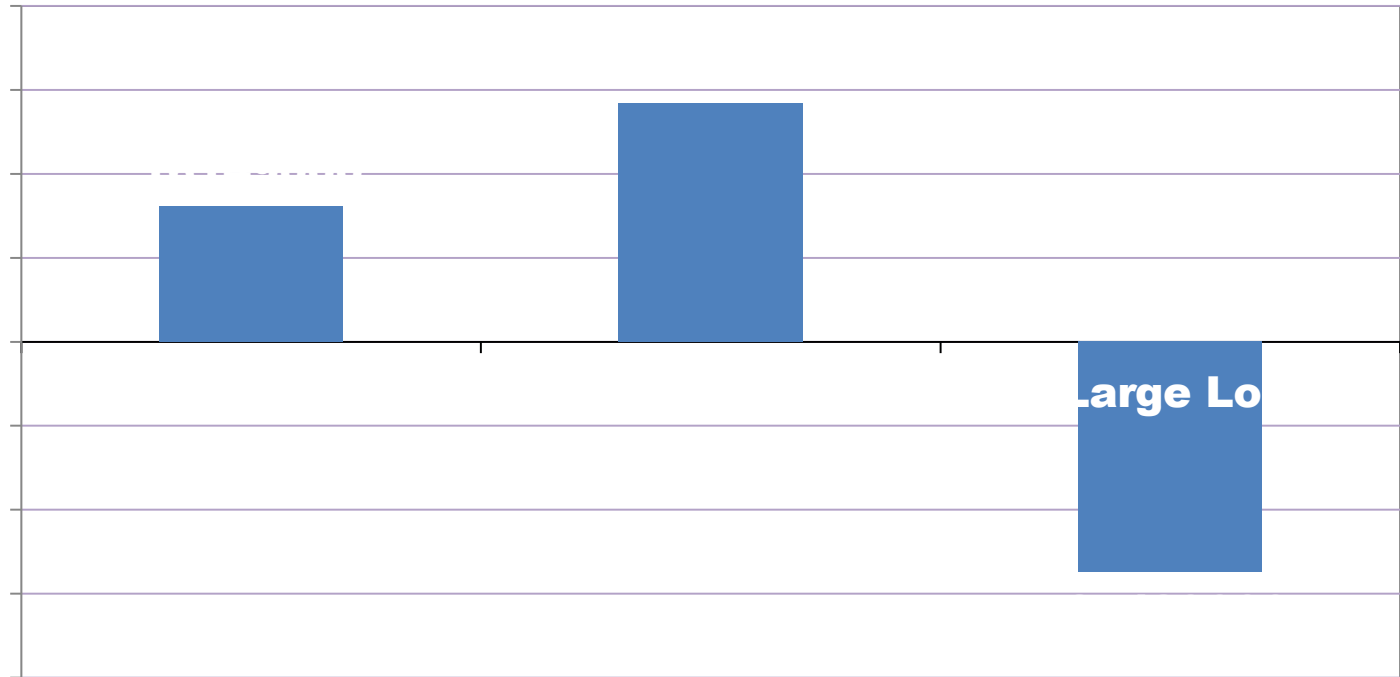
Changing Consumer Preferences



Changing Consumer Preferences

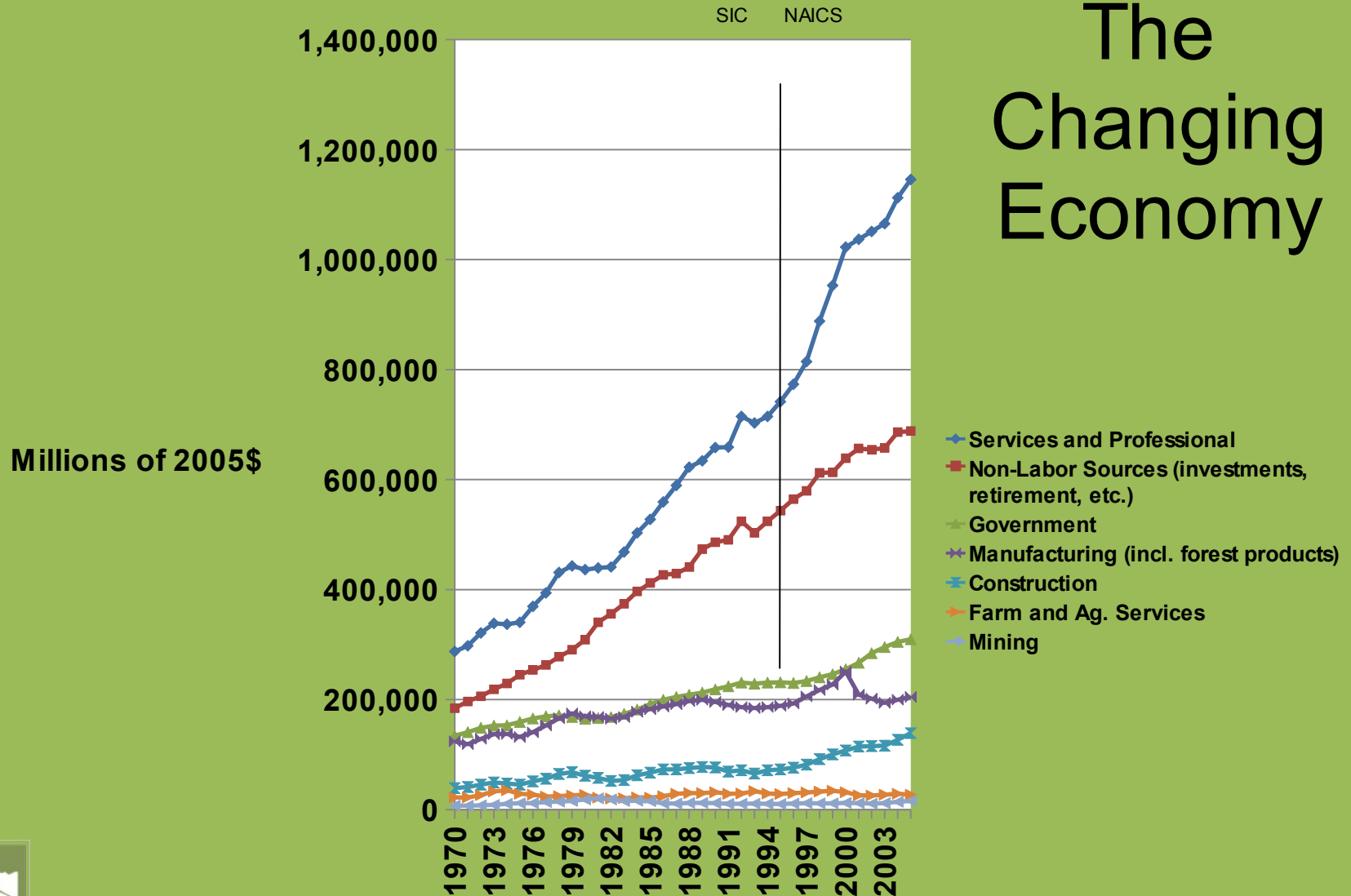


Reality Check: Supply vs Demand



Personal Income Sources in the West, 1970-2005

The Changing Economy



Economic Impacts of Tourism and Outdoor Recreation in Colorado

- Creates \$10 billion in economic activity and 107,000 jobs
- Produces \$7.6 billion in retail sales and services across Colorado.
- 65.7% of tourists in Colorado come for activities involving the natural environment.



So what does this all mean to watershed health?

- Entered a new normal, but don't know what it looks like yet
- 21st century real estate market will differ from what we've known
 - Greater demand for “in-town” development, mixed-uses, smaller footprints
- Growth is slowed, but not stopped – it will return
- How communities shape future development is essential

The future will not be like the past or the present.



Rethinking the Built Environment

In 2030, about half of the buildings in which Americans live, work, and shop will have been built after 2000.



Over the next 30 years, we will be responsible for re-creating half the volume of our built environment.

Analysis by Professor Author C Nelson

Principles for Water-wise Development

Improve Development Patterns

- *Strategic Location*
- *Compact Community Form*
- *Walkable Design*



Maintain Natural Infrastructure

- *Where not to grow*
- *Where to conserve*



Sustainable Site Design

- *Minimize stormwater runoff*
- *Reduce water demand*



Conserve Natural Infrastructure

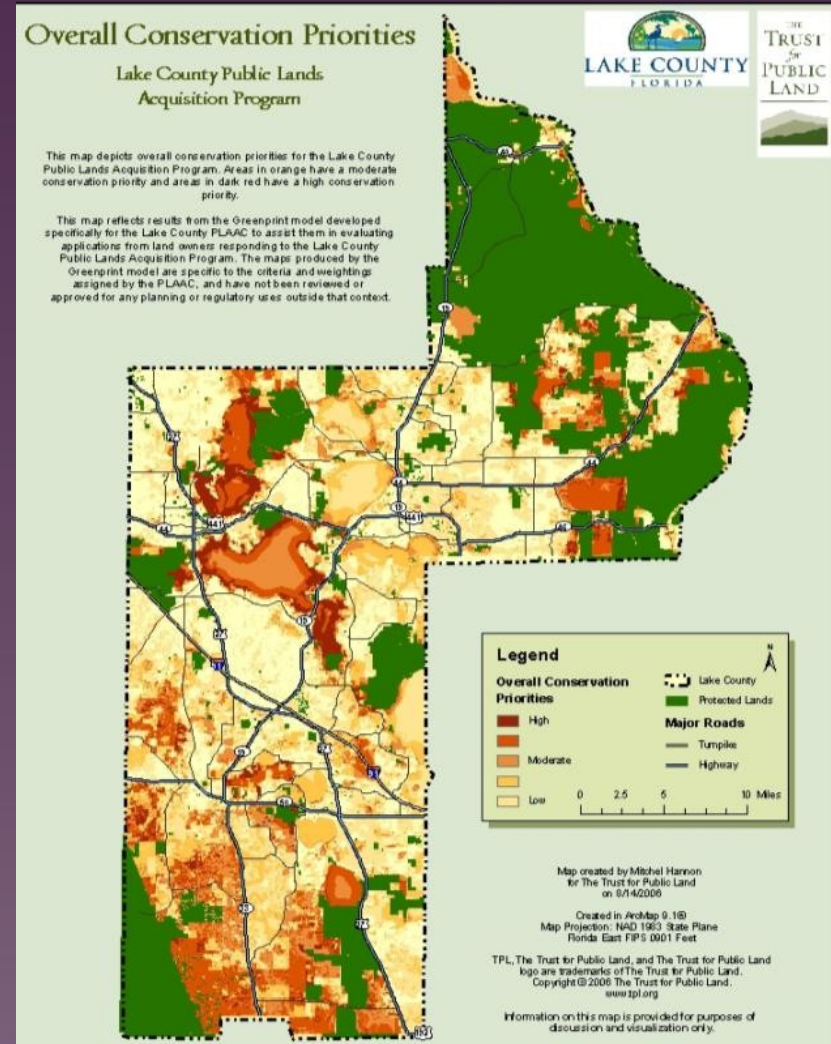
- Preserve large, continuous areas of open space
- Preserve or restore sensitive ecological areas



Where not to grow

ID areas not suited for growth:

- Floodplain / Riparian Areas
- Ecologically sensitive areas
- Steep slopes, fire hazard, etc.
- Areas without infrastructure
- Areas without water



Strategic Conservation

Resources & political will are limited: what exactly are you trying to protect?

1. Identify Conservation Priorities

- Engage the community in setting priorities

2. Create appropriate tools and programs

- Infrastructure planning
- Acquisition: Easements, TDR, PDR programs
- Policy: zoning, floodplain ordinances, riparian setbacks, clustering provisions, service area boundaries



Restore natural resource systems



Multi-functional parks & open space

~ floodplain + parks + habitat + open space + wetlands ~



Compact Development Patterns

Rethinking how we grow...

- Compact Community Form
- Smart location: Infill / Redevelopment
- Mixed Uses, Housing Types
- Walkability, Transit



Strategic Location

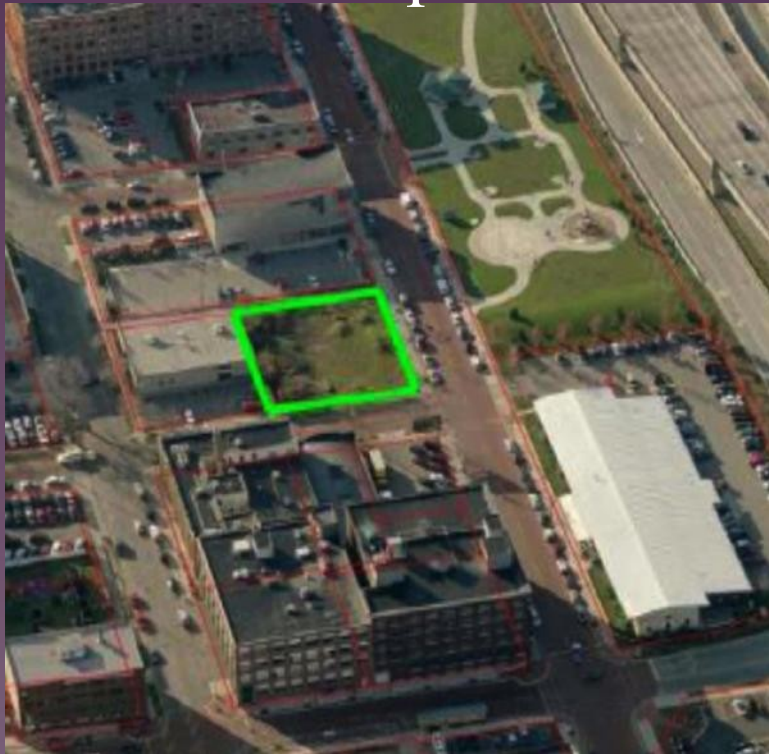
Guide development to strategic locations and encourage infill and redevelopment



- Map areas poised for infill/redevelopment
- Create incentives / remove policy barriers
- Link with economic development efforts
- Coordinate local planning efforts (IGAs)
- Infrastructure planning/policies
- Service area boundaries

Which location is better for water?

Infill Development



or

Edge Development

Click to edit Master text styles

Second level

Third level

Fourth level

Fifth level



Which location is better for water?

Redevelopment Site

or Greenfield Site



The Power of Infill and Redevelopment



The Power of Infill and Redevelopment



The Power of Infill and Redevelopment



The Power of Infill and Redevelopment



Compact Community Form

Apply community and neighborhood design principles to shrink the development footprint



- Enable density in appropriate locations
- Discourage low-density “sprawl”
- Eliminate policy barriers
- Ensure good design



Compact Community Form

Create transportation choices with trails, transit and walkable design



Which pattern is better for Water?



Lower density Development



Compact Development

Mixed Uses

Encourage a mix of
land uses &
development types



Click to edit Master text styles

Second level

Third level

Fourth level

Fifth level



- Remove policy barriers
- Assess market conditions
- Economic development programming
- Parking...

Mixed Uses



This type of housing is served by this type retail, roads, and parki

The Transportation Footprint

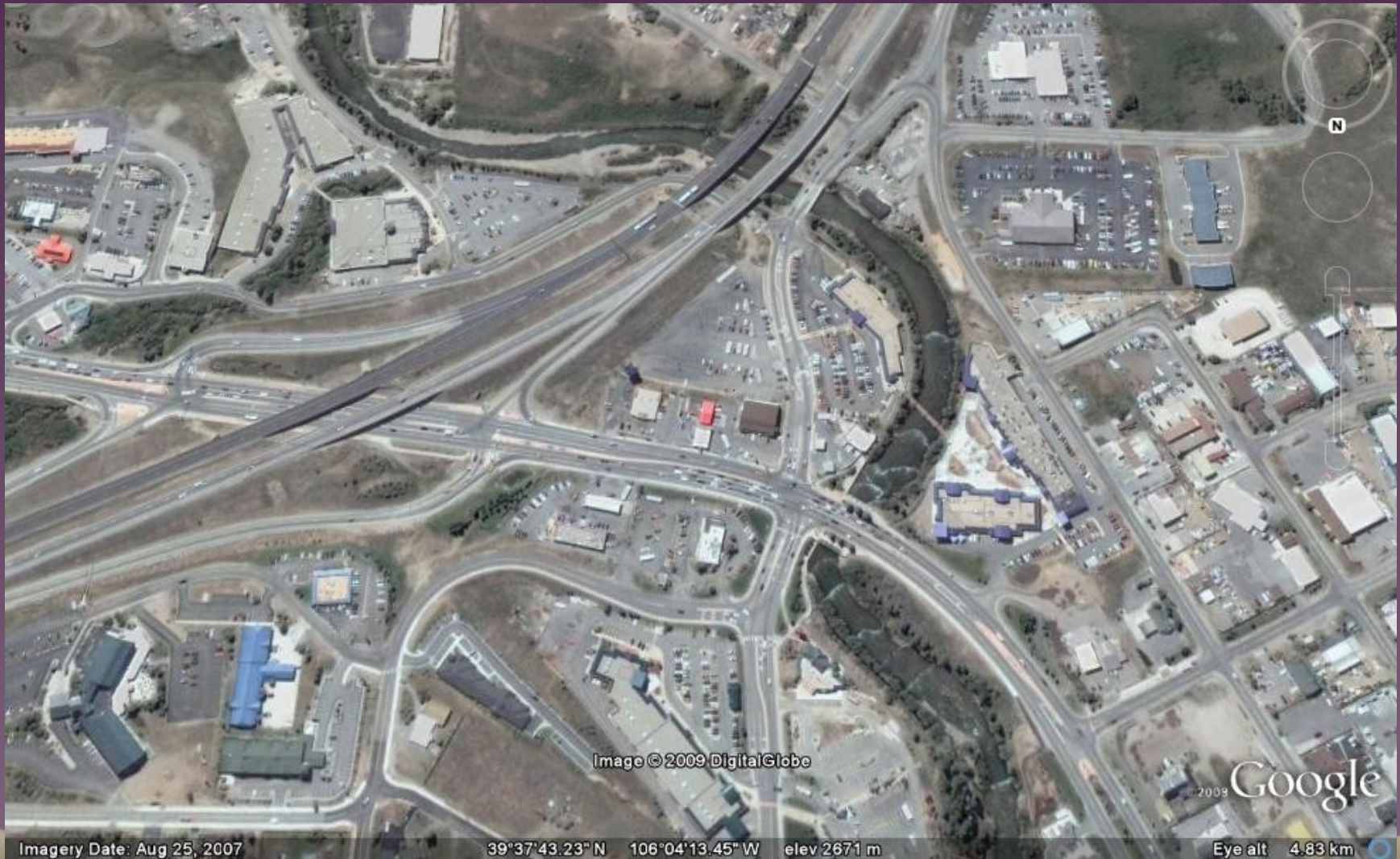


Image © 2009 DigitalGlobe

2009 Google

Imagery Date: Aug 25, 2007

39°37'43.23" N 106°04'13.45" W elev 2671 m

Eye alt 4.83 km

Mixed Use: The Watershed's Perspective



Livable Communities



III. Sustainable Site Design

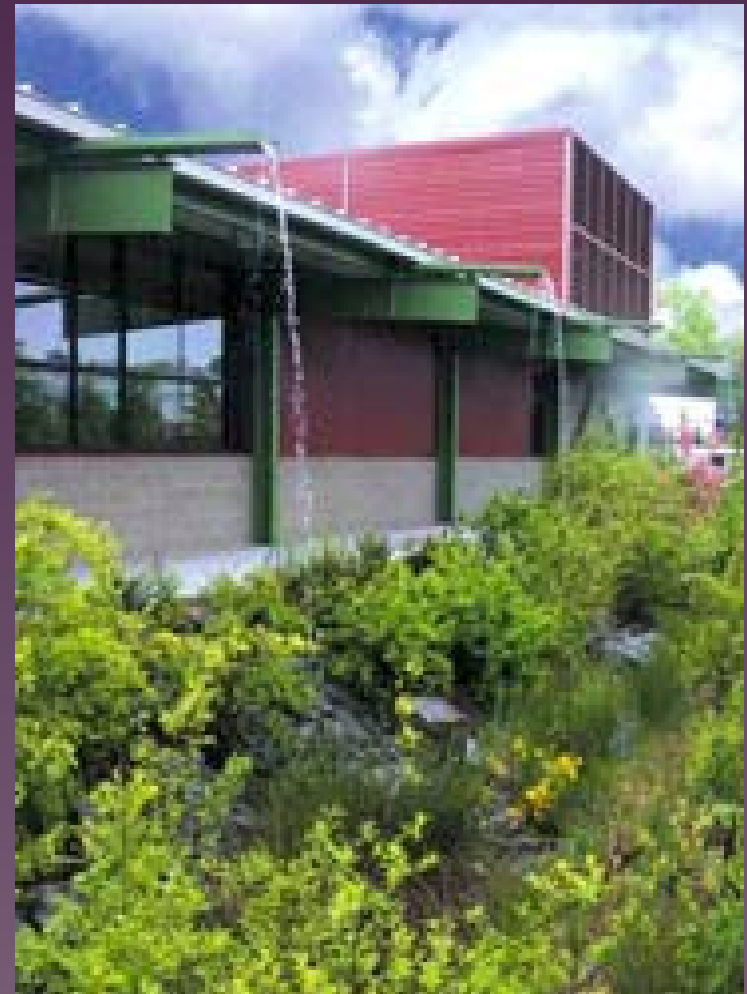
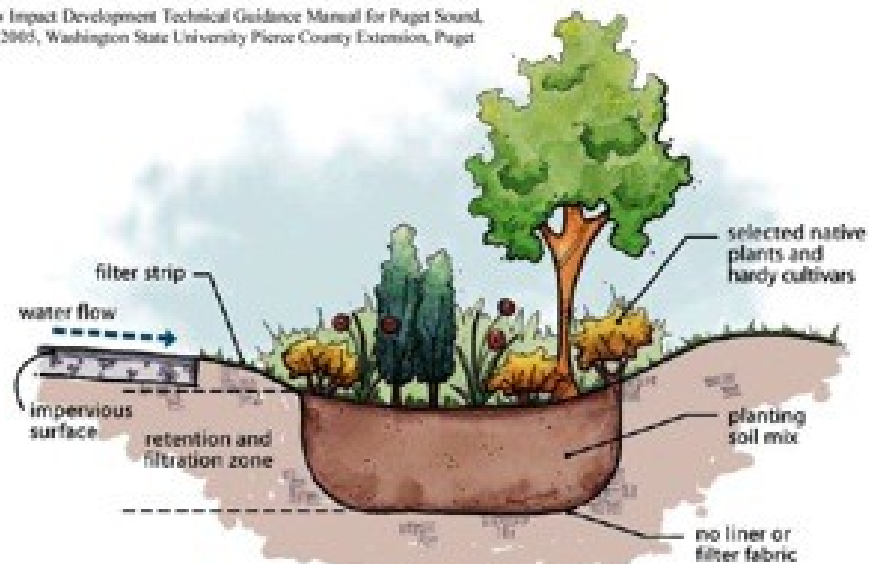
Integrate efficiency and green design infrastructure



Green Infrastructure:

A suite of planning and design tools to reduce, capture, treat and reuse stormwater runoff

Low Impact Development Technical Guidance Manual for Puget Sound,
Jan 2005, Washington State University Pierce County Extension, Puget



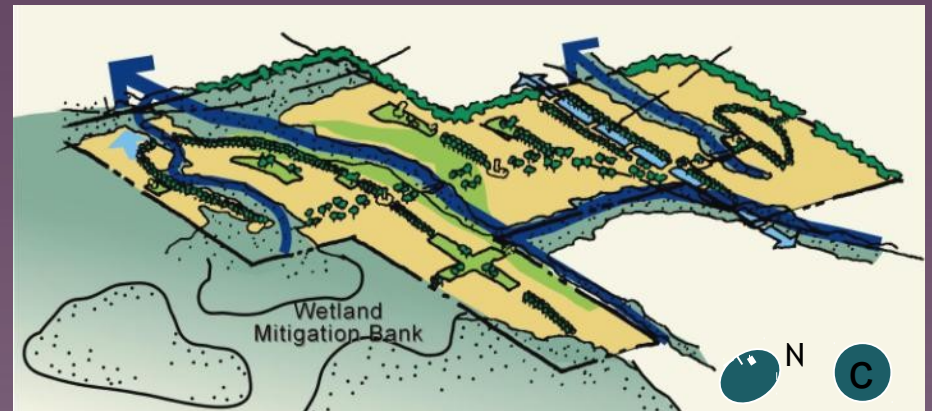
Minimize impervious cover



*Narrower Streets
Efficient Parking
Permeable Pavement*



Use drainage as a design element



“Green Streets”



Rethinking the Right of Way



“Green Streets”



Covington, KY



Water Use Efficiency

Water-wise landscaping

- Smart irrigation
- Water-efficient appliances
- Graywater systems
- Stormwater Capture
- Purple pipe for reuse



“Our cheapest, most readily available supply is reduced demand.”





**YOU'RE
ALL A
BUNCH OF
TREE-
HUGGING
HIPPIES!**



Questions for Watershed Groups

1. What is your role in promoting water-wise development patterns?
2. How do you best engage with local officials, planners, developers and others in promoting the “good stuff” and avoiding the bad stuff?



"Integration is easy on paper, but a lot more important and more difficult in the field than any of us foresaw".

- Aldo Leopold, 1934 -

Thank You

Clark Anderson
canderson@sonoraninstitute.org



The Watershed Benefits of Use Mix

A tale of Two Development Patterns...



Mixed Use

- 27,000 sq.ft commercial
- 1,100 sq. ft retail
- 140 Loft Apartments
- Parking

Conventional zoning

- Single, separate uses
- big box stores
- Lots of parking
- Lots of roads



x140)

The Math:

Housing +

Commercial sq.ft +

On site parking; loading +

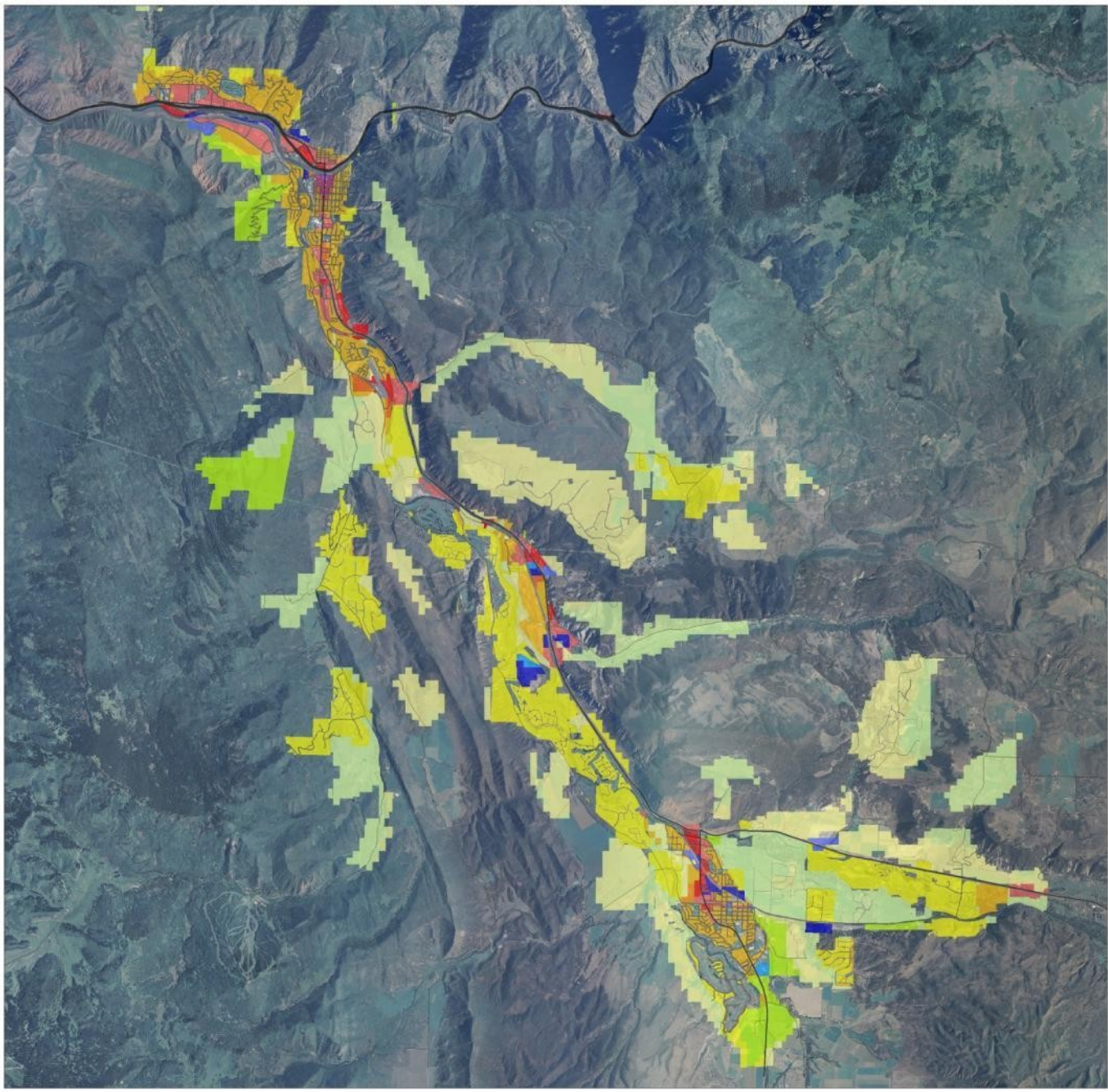
Off-site streets/roads/parking =





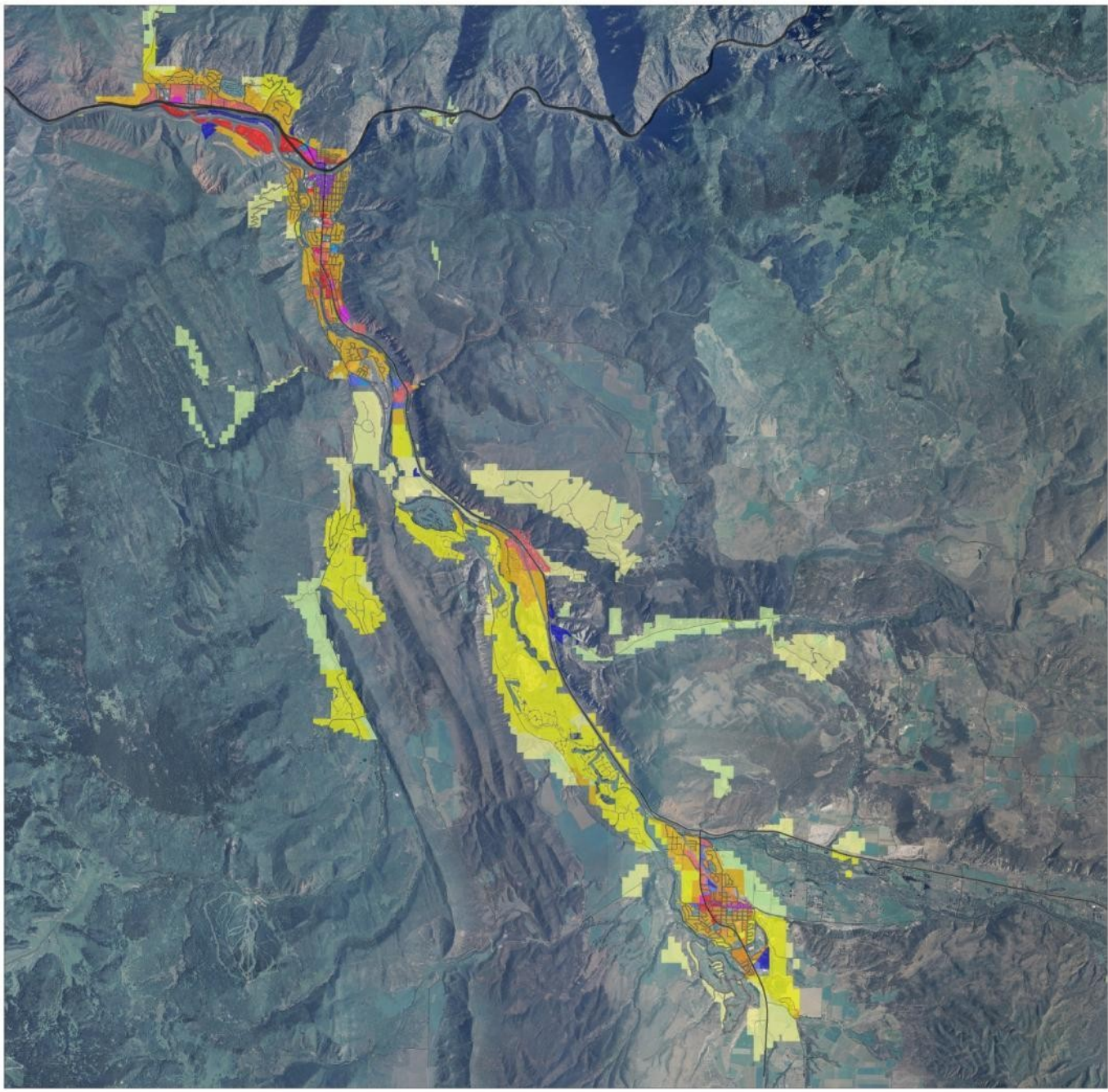
Business as Usual

Glenwood Springs and Carbondale



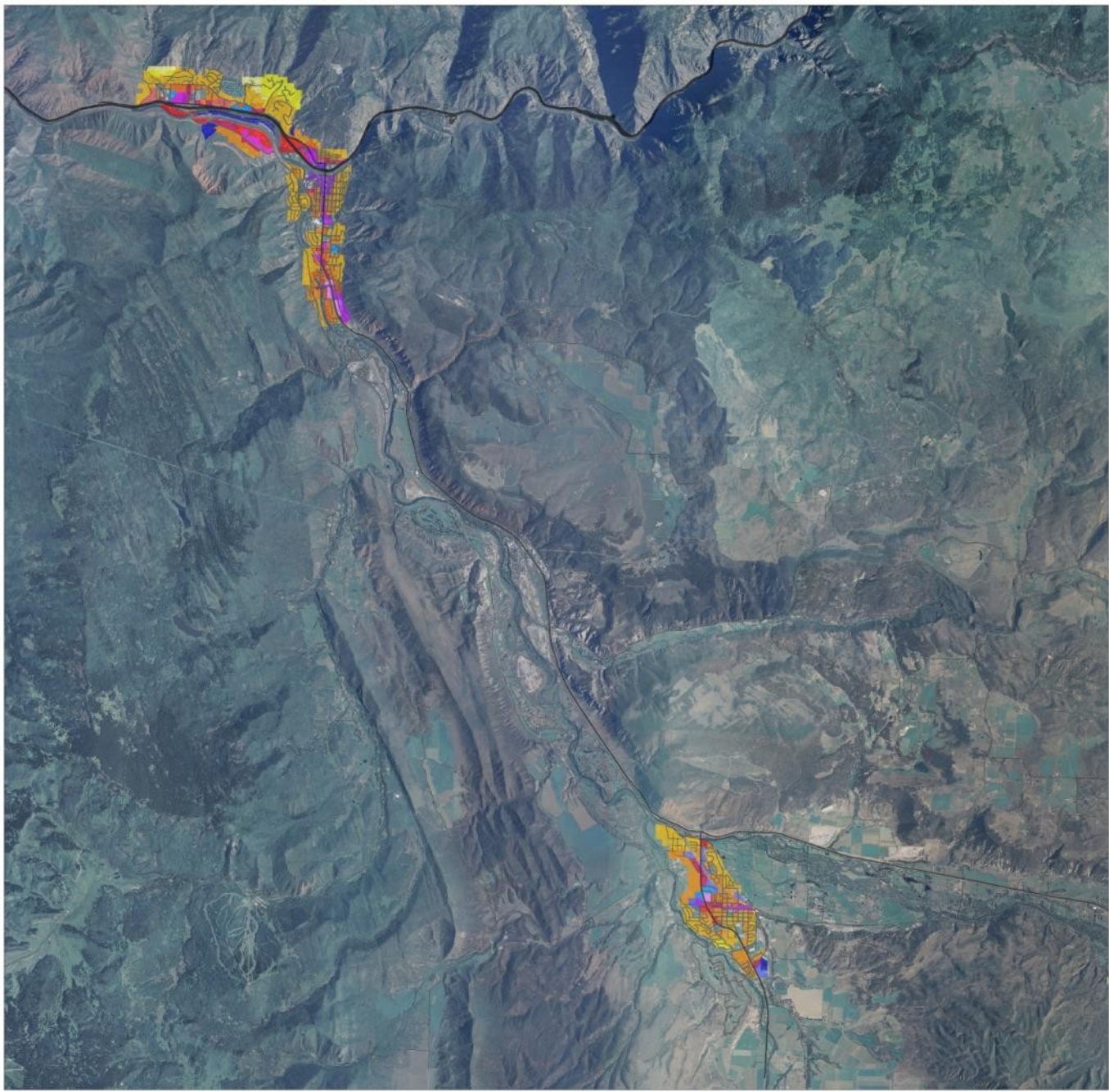
Comprehensive Plan

Glenwood Springs and Carbondale



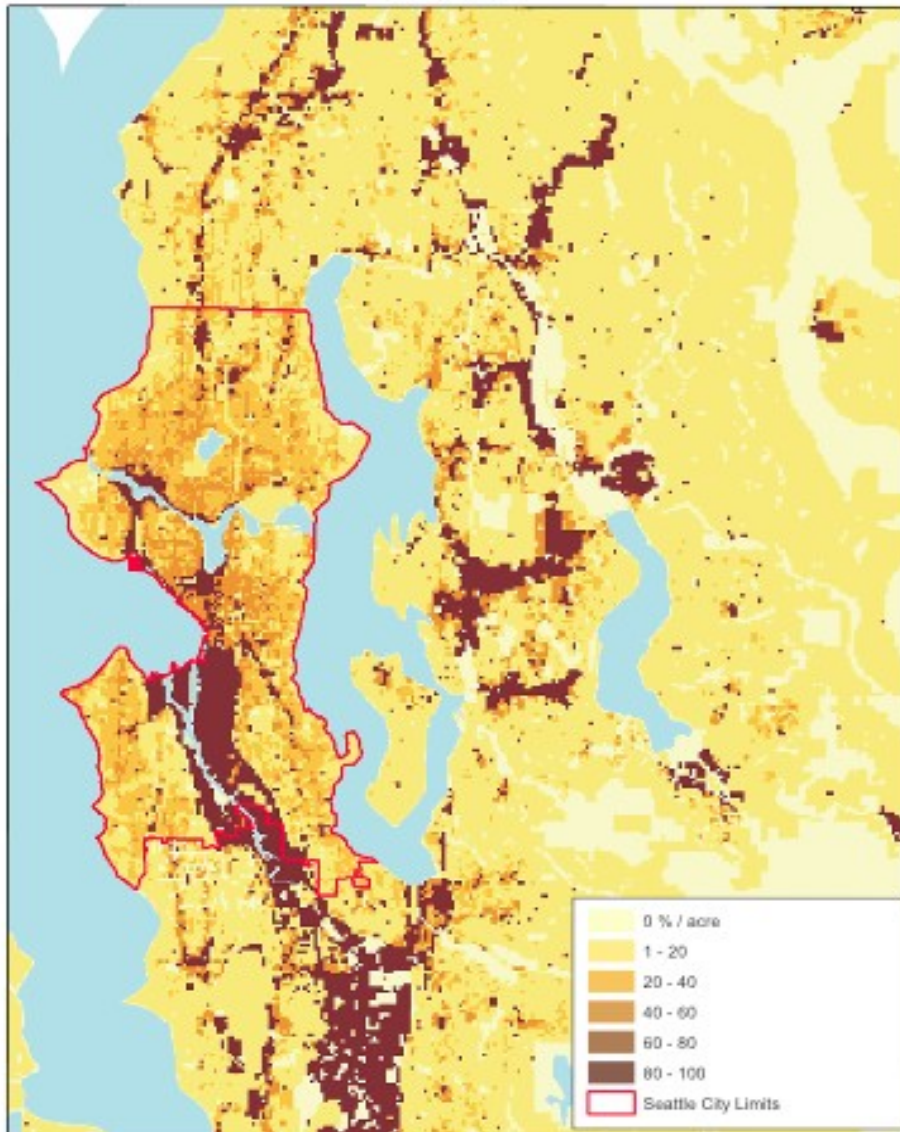
Town Centered

Glenwood Springs and Carbondale



Rethinking Impervious Cover

Per Acre



Per Capita



Source: Criterion Planners for the Puget Sound Regional Council