



Code and Regulatory Barriers to the Living Building Challenge

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CASCADIA
REGION GREEN BUILDING COUNCIL



Our current (and even our best) practices continue to do harm.



Business as usual is no longer an option.

What are the
OBSTACLES to true
innovation?





2006 International Building Code

101.3 Intent. *The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.*

Risk - Through the Microscope of Codes...



Risk - The Bigger Picture...

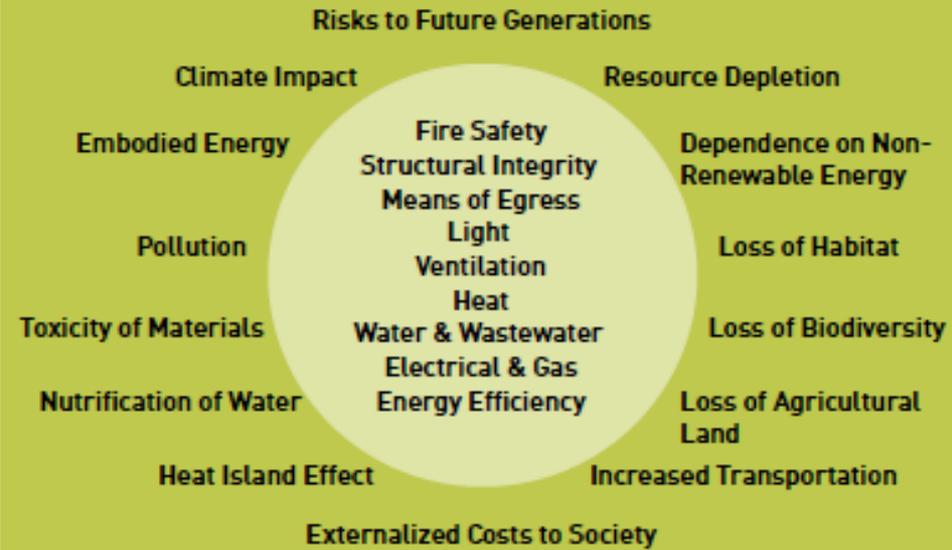
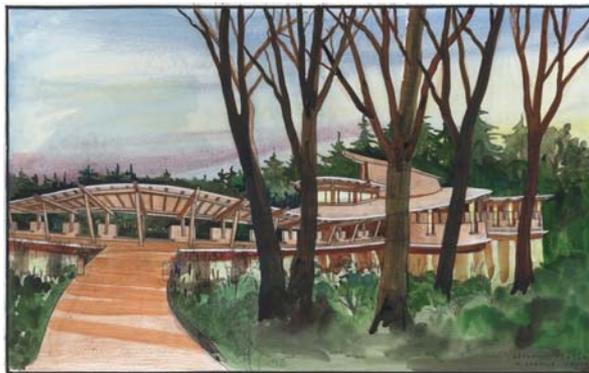


Diagram courtesy of the Development Center for Appropriate Technology – Copyright DCAT, 2000



Living Building Projects not only meet minimum standards imposed by regulations, but internalize larger risks of climate change impacts and resource use.



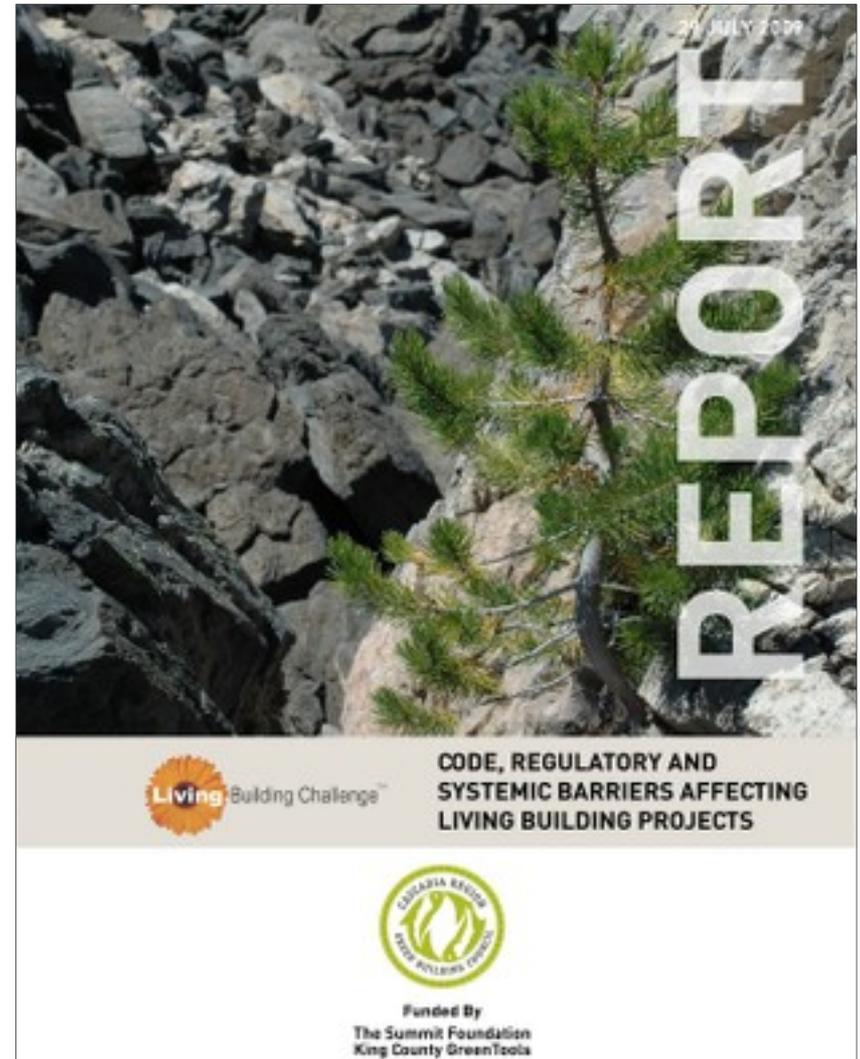
Addressing Code + Regulatory Barriers



Shifting from minimum requirements to regenerative practices

- Shifting risks from project level to balancing risks at all scales
- Seeking solutions, not just preventing problems

“Once the full risk profile of projects is included in regulatory considerations, it will become more difficult and expensive to gain approval for the most damaging projects than for the most beneficial ones. Governments in general, and the regulatory realm in particular, need to act decisively to reverse this preference as human and environmental health depend on it.”



Vancouver Code Study



Vancouver Code Study

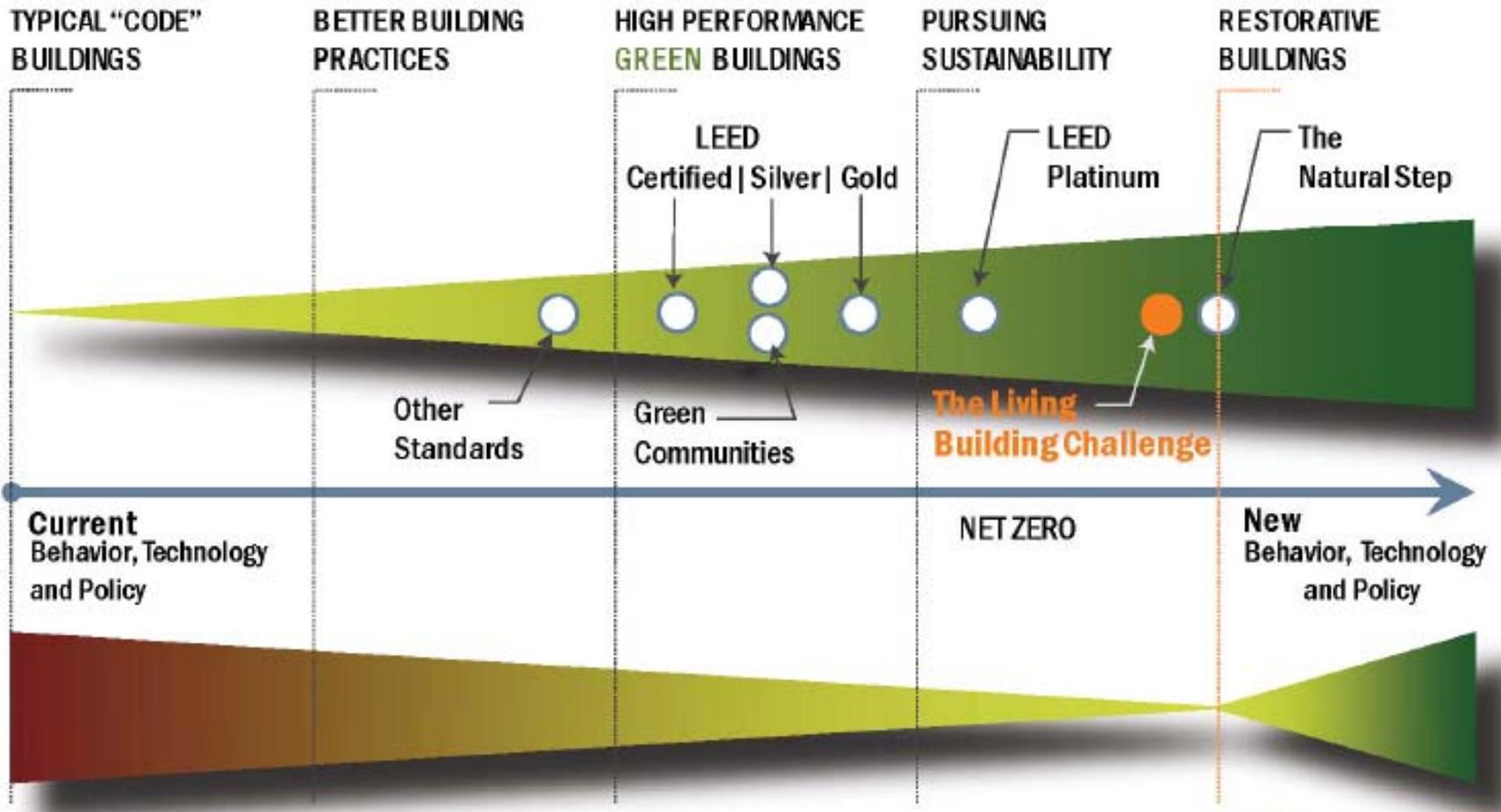
Goal

Evaluate code and regulatory barriers to LBC for affordable housing projects within both City of Vancouver & Clark County



Why ?

A LIVING BUILDING



Vancouver Code Study

Participants

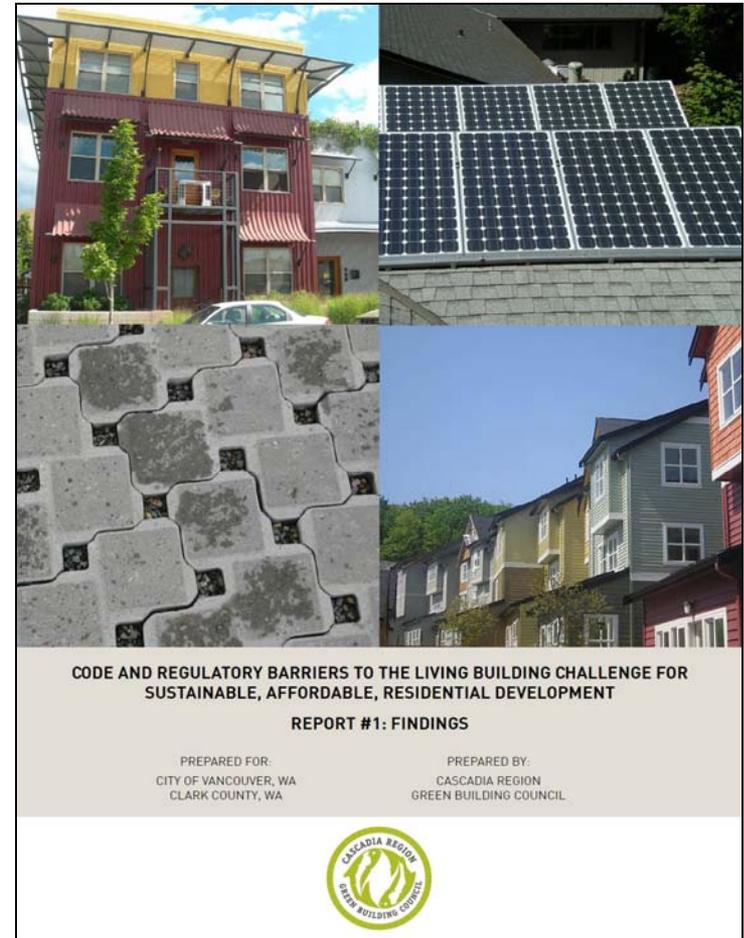
- Vancouver, WA
- Clark County
- Cascadia, Mithun, SERA
- Affordable Housing Partners
- Funded by CTED



Report #1: *Findings*

Report #2: *Recommendations*

Report #3: *Cost/Benefit Analysis*



www.ilbi.org/resources/research

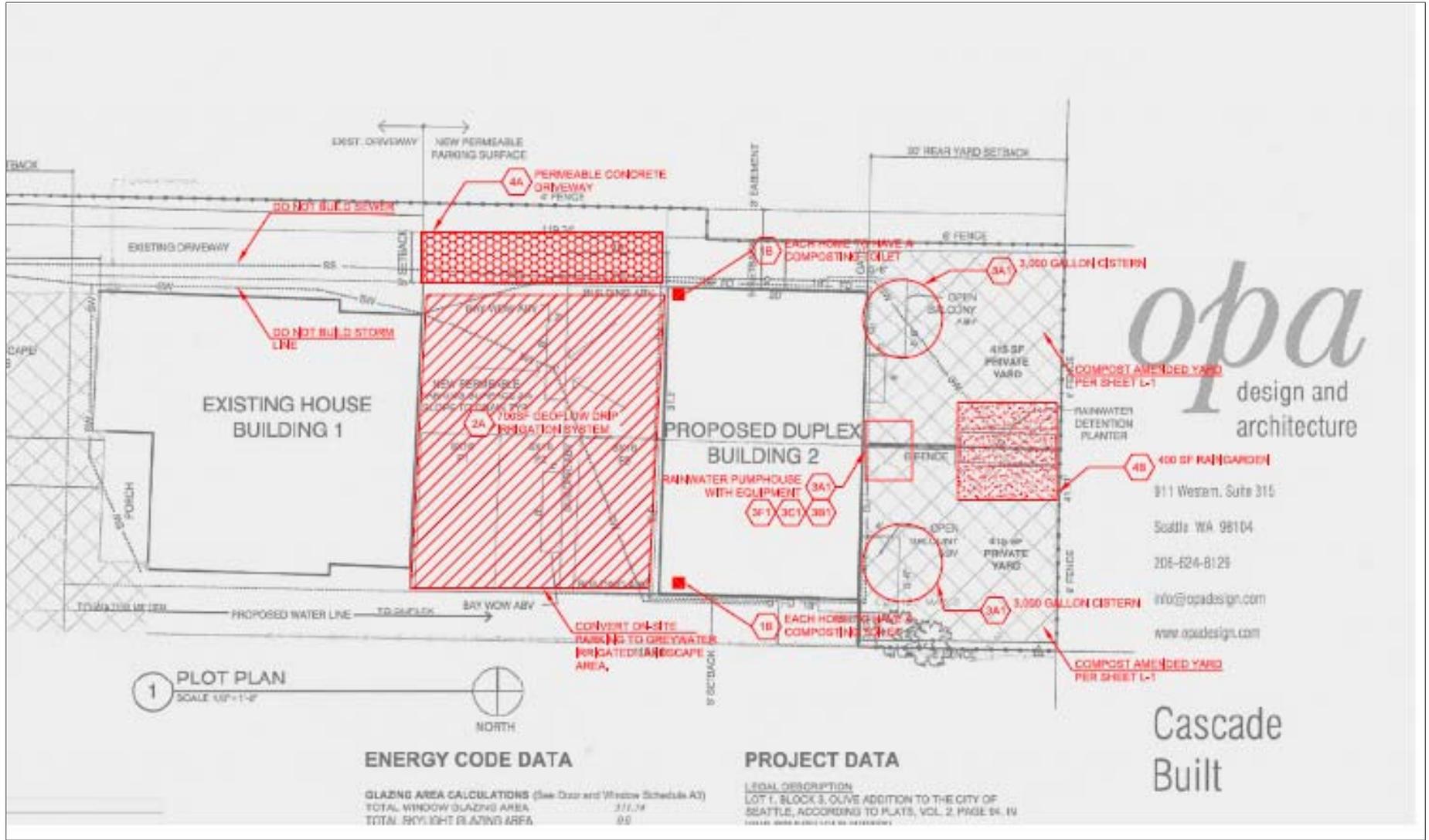


Process: *Selection of Case Study Projects*

- 2-unit urban townhome
- 54-unit urban stacked flat apartments
- 11-unit single family cottage development
- 34-unit multifamily co-housing project
- 175-unit master planned community
- 10-unit single family rural strawbale construction



Process: Applying LBC design strategies



Process: *Land Use, Development + Building Code Analysis*

Code	
Zoning	VMC Title 20, CCC Title 40
Land Divisions	VMC 20.320, CCC 40.540
Planned Unit Development	VMC 20.260, CCC 40.520
Site Plan	VMC 20.270, CCC 40.520
Grading	VMC 17.12, CCC 14.07
Erosion Control	VMC 14.24, CCC 40.380
Stormwater Management	VMC 14.25, CCC 40.380
Parking Standards	VMC 20.945, CCC 40.340
Street Standards	VMC Title 11, CCC 40.350
International Building Code – 2006 Edition	Standards and Amendments WAC 51-50
International Mechanical Code – 2006 Edition	Standards and Amendments WAC 51-52
International Fire Code – 2006 Edition	Standards and Amendments WAC 51-54
Uniform Plumbing Code – 2006 Edition	Standards and Amendments WAC 51-56, 51-57
Washington State Energy Code – 2006 Edition	WAC 51-11
Washington State Ventilation and Indoor Air Quality Code – 2006 Edition	WAC 51-13
On-site Sewage Systems	CCC 24.17
Group A Public Drinking Water Systems	WAC 246-290
Group B Public Drinking Water Systems	WAC 246-291
Large On-Site Sewage Systems	WAC 246-272B
Wastewater Treatment Facilities	WAC 173-240
Evidence of Adequate Drinking Water Supply	RCW 19.27.097

Report #1 Key Findings:

Land Use + Development Code Barriers





Key Findings:

Minimum Parking Requirements

In urban locations with access to alternative transportation options, reduced parking requirements can provide additional area for onsite systems such as greywater subsurface drip systems.





Key Findings:

Connection to Public Water

Connection to public water system is required where service is available and a waiver to this requirement would be needed from the City or County in order for Public Health to approve. Code changes to this requirement would need to be coordinated with water purveyors.





Key Findings:

Connection to Public Sewer

Connection required within UGA as a condition to building permit issuance. A septic permit cannot be issued by Public Health unless a sewer waiver is granted. Any variances would need to be coordinated with sanitary sewer service purveyors.





Key Findings:

Setbacks for Cisterns

For small urban lots, above ground rainwater harvesting cisterns must meet setback requirements limiting area available for water collection systems.





Key Findings:

Stormwater BMPs

Outdated stormwater codes in effect. Future adoption of 2005 DOE manual will allow low Impact development BMPs.





Key Findings:

Driveway & Fire Access Road Width Requirements

Increased impervious surfaces pose barriers to sustainable water discharge. Possible opportunities to reduce width requirements and promote pervious pavement options without compromising intent of code.





Key Findings:

Common Areas

Assessing if common areas can be allowed to double as onsite area for greywater and stormwater mitigation systems on constrained sites.





Key Findings:

Treatment of Group A Water Systems

Chlorination is mandatory for surface water systems. LBC requires treatment without chemicals.





Key Findings:

Rural Cluster Development

In the County, rural cluster developments only allowed where environmental critical areas exist.



Report #1 Key Findings: *Building Code Barriers*





Key Findings:

Toxic Materials

Where red listed materials are specifically called out in the codes (preservative and fire treated lumber, vapor retardants, PVC), costly to source alternatives and burden of proof for alternatives is on project teams.





Key Findings:

Energy Efficiency

Restrictions that present barriers to maximizing energy efficiency:

- Design temperature ranges for heating and cooling
- Insulation clearances in wall and roof cavities
- Passive crawl space ventilation requirements
- Advanced framing definition





Key Findings:

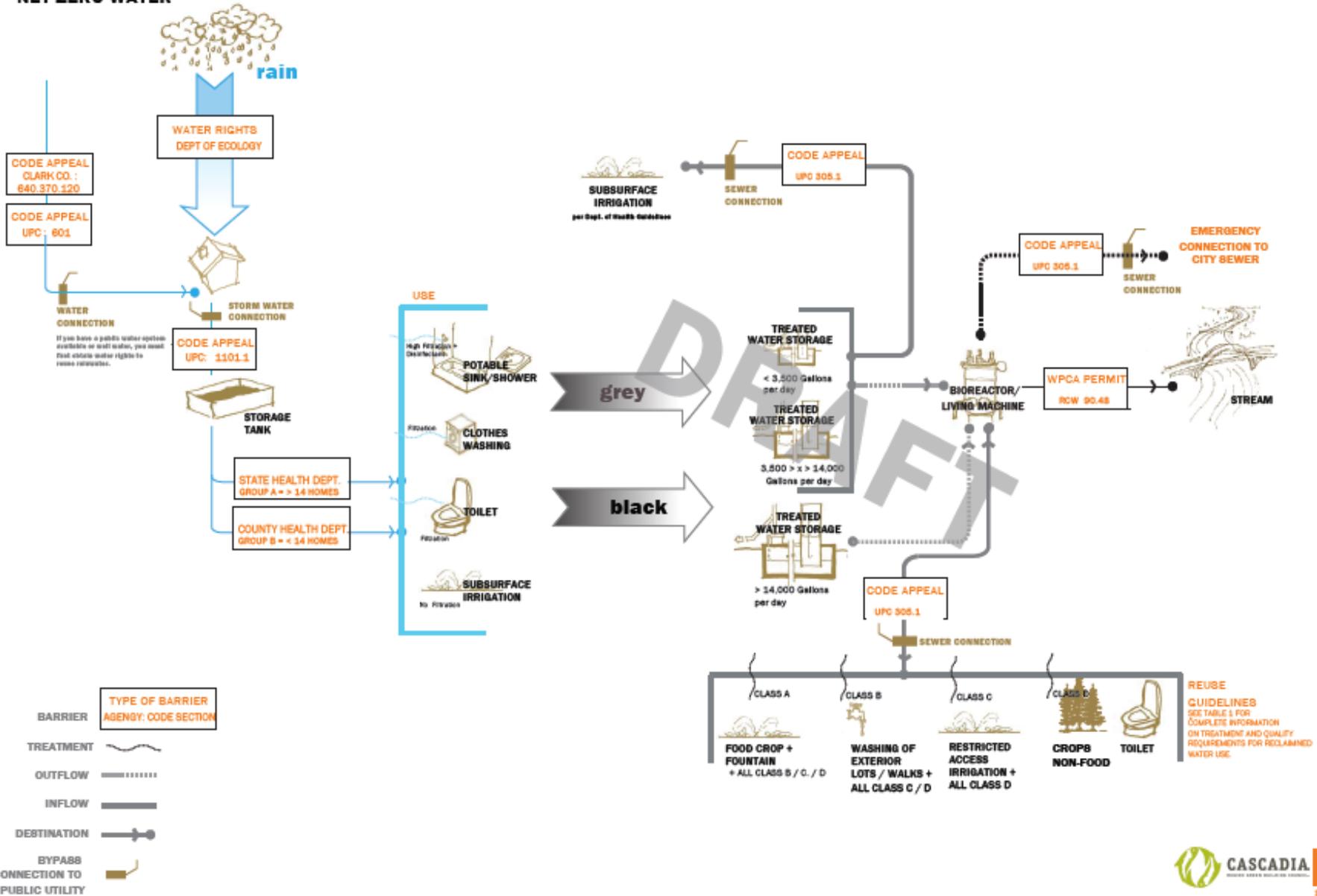
Water Supply & Discharge

UPC hurdles:

- Connection to sewer and storm utility required
- Antiquated fixture performance
- Potable water required for plumbing fixtures



WASHINGTON STATE NET ZERO WATER



Institutional Barriers

- Alternative Materials + Methods
- Linear Approval Process
- Lack of Information + Training
- Limitations to Changing Code



2009 Stakeholder Meetings



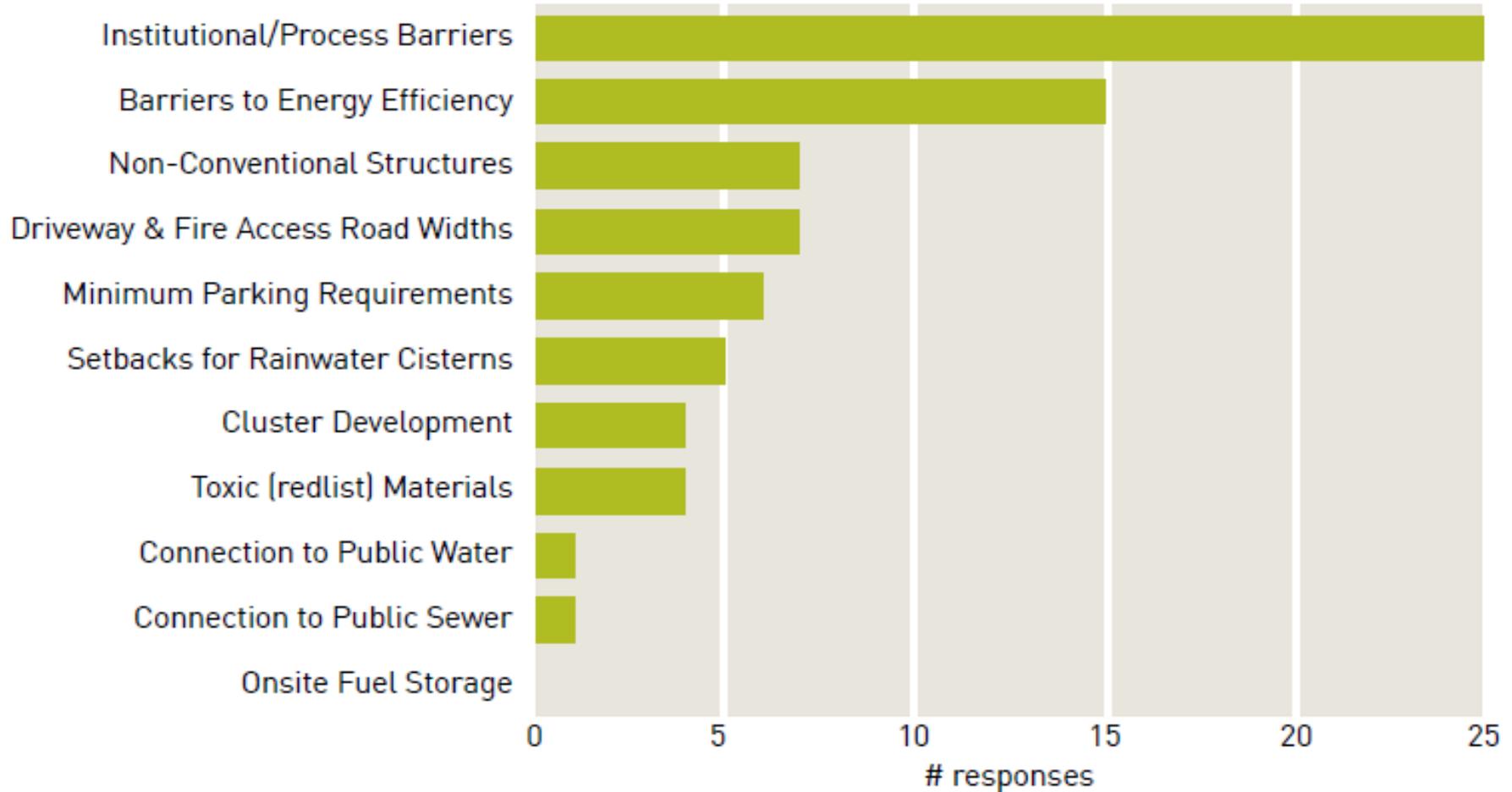
- ❑ Jan. 21st
Presented code obstacles and solicited feedback

- ❑ Feb. 11th
Brainstormed on strategies to remove the obstacles + met with targeted state/local officials on water barriers

- ❑ March 4th
Prioritized the strategies

Report #2 Recommendations

Table 1: External Stakeholder Priorities



Report #2 Recommendations

Institutional/Process Barriers

Short Term

Expedited/Priority Permit Processing
Mandatory Internal Trainings

Long Term

Mandatory Green Pre-application Meetings
Technical Assistance Program



Report #2 Recommendations

Barriers to Energy Efficiency

Short Term

Permit Guidance on Renewables + Passive Strategies
Density Bonuses for Efficiency Measures

Long Term

Mandatory Reporting + Mitigation of GHG
Performance Testing
District Energy Demonstration Ordinance



Report #2 Recommendations

Barriers for Non-Conventional Building Structures

Short Term

Flexibility for “Incubator” Projects
Code Guidance for Strawbale

Long Term

Code Advisory Committee for Alternative Technologies



Report #2 Recommendations

Driveway + Fire Access Road Widths

Short Term

LID Code Guidance

Long Term

Update Standards to Require Narrower Pavements

Stormwater Utility Fee Reductions



Report #2 Recommendations

Minimum Parking Requirements

Short Term

Include New Parking Requirements in City/County
Comprehensive Plan Update



Report #2 Recommendations

Above Ground Cisterns

Short Term

Code Guidance on Designing, Permitting,
Installing + Maintaining Cisterns

Amend Code



Report #2 Recommendations

Cottage Housing

Long Term

Develop New City/County Codes to Allow Cottages
and Cluster Developments



Report #2 Recommendations

Water Related Barriers

Short Term

Code Guidance on Designing, Permitting,
Installing + Maintaining Cisterns

Long Term

Neighborhood Scale Net Zero Water
Demonstration Project



Report #3 Cost-Benefit Analysis

Benefits

- Environmental
- Societal
- Financial

Costs

- Staff
- Training
- Outreach
- Infrastructure



Report #3 Cost-Benefit Analysis

TABLE 3: PRIVATE SECTOR COSTS / PAYBACK

This table summarizes the anticipated first cost increase and payback for the single family residence and multi-family residence when prerequisites of the Living Building Challenge are met.

Project Size	Anticipated First Cost Increase	Payback
SINGLE FAMILY RESIDENCE	27-32% increase	30 years
MULTI-FAMILY RESIDENCE	31-36% increase	22 years



Next Steps

Clark County Sustainable Communities

*Project Purpose:
Engage key stakeholders to
craft a regional strategy for
fostering sustainable
development across the
County with a goal of 50%
participation.*





CASCADIA
REGION GREEN BUILDING COUNCIL



Thank you!

Cascadia Region Green Building Council
www.cascadiagbc.org

