SUSTAINABLE LAND DEVELOPMENT IN SOUTHWEST VIRGINIA :

HOW DO WE GET THERE?

This report is a product from the New River Valley Planning District Commission and Sustainable Blacksburg Partnership for promoting sustainable land development in our region. Funding provided by: a USDA Forest Headwaters Land Care Partnership Grant and a Private Foundation.

The Recent History of Regional Sustainable Land Development Initiative in the New River Valley

In the spring of 2005, the Landscape Architecture and Urban Planning Department at Virginia Tech in Partnership with the Virginia Department of Forestry (DOF), evaluated the design of several new conservation subdivisions around the New River Valley. The study included a meeting with developers to talk about the issues associated with building subdivisions that had clustered housing. The results of the project referred as "Sustainable Development of Forested Lands" can be found at http://www.uap.vt.edu/forests/forests.html . This study planted the seeds that have grown into a multi scaled sustainable land development planning effort in the New River Valley.

Following the above study, in the summer of 2006, the New River Valley Planning District Commission and the Conservation Fund obtained funding from the Virginia Environmental Endowment and Department of Urban and Community Forestry to explore a Green Infrastructure approach to land use planning for the New River Valley. It was then that the New River Valley Regional Green Infrastructure Partnership was launched. Green Infrastructure can be broadly defined as an interconnected network of open and natural areas that contribute to the health and overall well-being of a community or region. This concept recognizes that development is imminent and embraces growth that is strategically planned to conserve cultural heritage and maintain the natural systems that we depend on. Green Infrastructure considers these natural systems, such as our water table and clean air, as equally important to our well-being as the gray infrastructure that enables unprecedented convenience in our lives.

In order to implement sustainable land development patterns across a landscape, the planning process must be linked across multiple scales, from the local parcel level to a larger regional, landscape scale. In the broadest context, sites considered for development must also be considered in the context of the regional landscape. The Green Infrastructure approach provides the planning framework to help determine where the most significant open space associated with multiple parcel level sites are located. Certain site characteristics, such as designation as an area of cultural or natural significance, access to gray infrastructure, and characteristics of surrounding areas, will determine how and if the site should be maintained as open space or be developed. Specifically, what design elements ensure compatibility with long-term community plans related to its green infrastructure (i.e. clean air, clean water, recreational areas, wildlife areas, etc.)?

To be truly successful, there must be tools available to the individuals, agencies, and organizations working at those different scales, addressing specific planning challenges and opportunities. Currently in Virginia we have very few effective tools available to promote sustainable land development. Conservation easements are the most widely used tool, but not appropriate for every situation. Local zoning and ordinances can also be used, but currently they are not configured to give us the type of development patterns that are useful. Sustainable site selection and landscape design for new development is a potential tool that communities can use at a local scale in an effort to protect ecological services across a community or region.

One option for communities and developers desiring to create sustainable communities is to participate in third-party certification programs designed to recognize developments that critically evaluate new developments against measures and criteria for balanced community growth. Several third-party criteria

exist nationally, some with specific criteria for different regions of the country. Regional criteria are critical for capturing the unique ecological characteristics (i.e. promoting xeriscaping in desert climates) for new development. Certification programs are actively working on developing criteria and strategies that address the unique challenges of developing in the mountainous and predominantly rural areas of Southwest Virginia. Until then, Southwest Virginia communities and developers can only begin to initiate conversations about the certification programs, and not take full advantage of these resources.

In an effort to launch conversations about site specific sustainable design criteria for new development in the New River Valley, Sustainable Blacksburg and the New River Valley Planning District Commission and its partners, developed a full-day "Sustainable Land Development Workshop" during Sustainability Week in Blacksburg in October 2007. This workshop highlighted Green Infrastructure planning concepts and conservation subdivision development through programs such as Earthcraft Communities and LEED Neighborhood designs. The workshop was attended by local developers, locality planning staff and other interested groups and had a total of 68 participants from around the region.

At the close of the workshop, a smaller group convened to discuss how best to continue promoting sustainable land development within the New River Valley within the context of the developing green infrastructure assessment. Among the suggestions from this group was to partner with Southface Energy Institute, who serves as administrator for Earthcraft Communities (a third party certification program) and to explore using the NRV area as a pilot area for the development of a mountain region Earthcraft criterion for the Southeastern United States. The local group from the NRV was also interested in using a pilot project site plan to evaluate if it is feasible for developers to utilize a 3rd party criteria program under current zoning/subdivision. These pilot projects present the opportunity to begin identifying potential issues with current land use regulations in this region.

In May 2008, Sustainable Blacksburg, the New River Valley Planning District Commission and their Green Infrastructure Partners contracted the Southface to facilitate the workshop. The workshop was made possible by two grants from the Forest Headwaters Land Care Partnership and a private foundation that wishes to remain anonymous. Using two developments in NRV that would become the first certified Earthcraft Communities in the area, the workshop opened up the development process to all stakeholders to help identify challenges and issues surrounding sustainable land development. The workshop provided a valuable opportunity to understanding the certification process and to begin the process of critically evaluating criteria for the region. A full workshop report from Southface is attached as Appendix A.

Challenges and Opportunities

At October 2007 meeting and again at the May 2008 workshop, participants identified challenges specific to creating sustainable, ecologically sensitive, livable communities in the New River Valley. These challenges and goals have been translated into action items and can be found in Appendix B.

APPENDIX A:

SOUTHFACE REPORT FROM EARTHCRAFT COMMUNITIES WORKSHOP

May 2008

SUSTAINABLE LAND DEVELOPMENT WORKSHOP REPORT

Facilitated by

Southface

Responsible Solutions for Environmental Living

Executive Summary

On April 28th & 29th, 2008 a Sustainable Land Development Workshop was held at Montgomery County Government Center in Christiansburg, VA hosted by The New River Planning District Commission, Floyd Community Properties and Community Housing Partners with facilitation by Southface Energy Institute. The workshop brought together policy officials, design professionals, and local community members to create conceptual designs for the development projects and a sound knowledge and resource base from which to explore and implement sustainable development policies. The purpose of the workshop was: to explore sustainable construction, design and planning strategies for two development properties in the area, identify the opportunities and challenges of the EarthCraft Communities Piedmont Criteria relative to the development patterns and natural landscapes present in the region and identify local policy issues, opportunities, and challenges to providing incentives for sustainable land development in the region. This report is a summary of these issues and a proposal of next steps for promoting sustainable land development within the region.

Program

The Sustainable Land Development Workshop was organized into two main segments; one focused on developing a collective definition of sustainability, understanding environmental issues affecting the region, and identifying the main issues, challenges and opportunities for sustainable land development policies and tools. The other focus of the workshop was the facilitation of two upcoming development project design charrettes wherein design teams and community members established goals and identified specific strategies the developments can use to attain these goals. This was accomplished by over nine hours of charrette activity.

In Attendance

Attendees	Affiliation
Adele Schirmer	Town of Blacksburg, Engineering
Amy Adams	Architect- Wall Residences
Anne Guppie	Wall Residences
Anne McClung	Town of Blacksburg, Head of Planning
Becky Coleman	Congressman Bouchers Office
Bill Gardner	Floyd Board Supervisors
Bo Abernathy	Floyd County Industrial Development Authority
Bob Strenze	Developer
Charlie Wade	Town of Pulaski, Current Mayor
Chris Burkett	Department of Game and Inland Fisheries
Clay Hodges	Altizer, Hodges, & Varney, Inc
Colin Arnold	Community Housing Partners
Courtney Kimmell	Virginia Tech, Landcare Institute
Dave Rundgren	New River Valley Planning District Commission, Executive Director
David Wall	Wall Construction
David Zachow	Direct Connect Solar
Deborah J Cheslow	Regional Technical Manager-EarthCraft Virginia
Derrick Meyers	Town of Blacksburg, council member
Don Langher	Town of Blacksburg, council member
Ed Cohn	
Elizabeth Vogel	Town of Blacksburg, Community Housing

Eric Sallee	Developer
Erica Adams	Virginia Tech Water Resources Center
Brad Wright	Virginia Department of Forestry
Gary Coggins	Virginia Department of Health
Holly Lesko	Town of Blacksburg, Planning Commission Member
Jack Wall	Wall Residences, Owner
James Ruhland	Community Design Studio/Community Housing Partners
Janaka Casper	Community Housing Partners
Jeff Worrell	Town of Pulaski, Newly Elected Mayor/Current Town Council
Jennifer Wilsie	New River Valley Planning District Commission, Regional Planner
Jessamyn Losse	Community Housing Partners
John Henry	VP of Development CHP
John Neel	Gay and Neel, Vice-President
John Ustis	New River Land Trust
Josh Galloway	Better Housing Coalition
Josh Hollway	Community Housing Partners
Kamala Bowers	Wall Residences, Owner
Kamilia Lawson	Community Housing Partners
Karen Drake	Town of Blacksburg, Comprehensive Planner
Karl Bren	Earthcraft Virginia
Kelley Day	Community Design Studio/Community Housing Partners
Kevin Byrd	New River Valley Planning District Commission, Regional Planner
Kevin Conner	Gay and Neel – Landscape Architect
Lou Murray	Virginia Department of Forestry
Mark Schonbeck	
Matt Hanratty	Town of Blacksburg, Community Housing
Michael Maslaney	Town of Floyd, Town Manager
Meredith Jones	Tom's Creek Investors L.C. Project Manager/Engineer
Melissa Skelton	City of Radford, Grant Writer
Nell Boyle	US Green Building Council Roanoke Chapter
Patrick Bixlar	Sustainable Blacksburg

Patrick Hughes	Hill Studio, Planner
Peter Ozolins	Architect
Reginea Elser	New River Valley Planning District Commission, Regional Planner
Richard Caywood	Virginia Department of Transportation
Ron Rordam	Mayor of Blacksburg
Skip Slocum	Real Estate- Floyd Ecobroker
Steve Sandy	Montgomery County Planning Director
Susan Anderson	Town of Blacksburg, council member
Susan Garrison	Town of Blacksburg Public Works Environmental Program Manager
Tamim Younos	Virginia Tech Water Resources
Than Hitt	Virginia Tech
Todd Peacock	Community Housing Partners
Maggie Dorsey	US Green Building Council Roanoke Chapter

About Southface

Southface is an independent non-profit organization that promotes sustainable homes, workplaces and communities through education, research, advocacy and technical assistance. Since 1978, the Southface Energy Institute has earned a national reputation for education and research in energy, building science and environmental technologies. Recognizing the need for a standard of building environmentally responsible homes, Southface joined the Greater Atlanta Home Builder's Association in 1999 to develop the EarthCraft House program. The program is a blueprint and third-party verification tool for healthy, comfortable, affordable homes that cut energy and water bills and protect the environment. In partnership with The Urban Land Institute, Atlanta Regional Commission, and the Greater Atlanta Homebuilders Southface applied the strategy to the broader development needs of planned communities in the EarthCraft Communities Program.

EarthCraft Communities provides a tool that can be used by developers and homebuyers, as well as public officials and citizen advocates, to evaluate and improve the quality of our communities. The program is voluntary, market-based, and rewards responsible developers with a well known and trusted certification for green development.

Sustainable Land Development Workshop

Sustainability Defined

During the first segment of the workshop, participants were led through several exercises during which they expressed their ideas, frustrations and experiences with sustainability. After sharing their ideas about sustainability, charrette attendees worked together to develop a working definition of this ubiquitous term to place parameters for its use throughout the workshop. The workshop participants developed the following list of sustainability components that regional policies and projects should address.

Components of Sustainability:

Sustainability Defined

- Should consider future generations
- Indefinite
    - Flexible
- Regenerative
    - Biomass as a measure
- Accessible
    - Financially and physically
- Desirability
    - Good design
    - Resilient

Describe your Experience with Sustainability:

- Living off the grid
- Retrofit of structures
- De-constructable buildings
- Freedom
- Objective, subjective = priority structure
- Not burning
- Camaraderie
- Systems approach
- Must be a community - people are a priority
- Interaction - community
- Self-contained
- 5 acres, 70% open

Barriers to Sustainability

- Disposable society
- Economic model – design problem
- Constant growth – government policy
- Oil dependency
- Regulation
- Externalization
- Lack of education on sustainable issues, consequences, etc.
- Elitism – cultural
- Lack of transportation options.

Regional Opportunities for Sustainability

Mountain Issues

One of the objectives of the workshop was to identify specific issues concerning the mountain and valley region of western Virginia not currently addressed within the EarthCraft Communities (ECC) program as well as the criteria within the communities program that may need reconsideration for applicability to the mountain region. All of the following issues need further research in a formal ECC pilot process.

- Critical Slopes
- Geology (Karst)
- Septic Tanks
- Connectivity
- Greenspace
- Common Trenching
- Rural Landscapes

Sustainability Challenges & Opportunities

The final segment of the workshop required the participants to identify local policy challenges impeding the development of more sustainable communities as exemplified in the Harding Avenue and Floyd Community designs. Several issues were mentioned; however, after voting, not all were elected for discussion. The following is a list of the topics mentioned but not identified as most important for discussion by workshop participants: Sewer, Geology (Karst), Greenspace

Connectivity, Greenspace Management, Drought/Fires, University Impact. The following is a summary of each challenge (problem, responsible parties and potential solutions) as discussed in breakout groups.

Water Sources/ Conservation

Problem #1: Graywater and blackwater are considered identical in the region, thus discouraging cost-effective and environmentally sound methods of wastewater treatment and reuse.

Solution: Research precedents in graywater management for similar regions and work with the Health Agency to reconsider/revise regulations regarding its reuse and treatment, separate from blackwater. Consider the differences between urban and rural graywater reuse/treatment best management practices.

Problem #2: Geology/Karst formations threaten the quality of groundwater in the region and pose a challenge to sustainable land development if karst formations are found on site.

Solution: New River Planning District Commission should devise a model stormwater ordinance for local governments to adopt. Such a model ordinance would particularly address karst when found on site. This ordinance would serve to coordinate and raise the bar of development requirements, thus protecting the ground water as an invaluable resource in the region. This ordinance needs to address post-development stormwater management requirements for new development and redevelopment in a community and should define requirements for a post-development stormwater management plan, (required in order to undertake land development activities). This post-development stormwater plan should contain the details of how the development will address post-development stormwater runoff quality and quantity impacts resulting from the permanent alteration of the character and hydrology of the land surface as well as the nonpoint source pollution from land use activities. The ordinance should outline the water quantity and quality performance criteria for managing this runoff and specify local requirements for the use of structural stormwater controls and nonstructural practices, in order to protect public health and safety, protection of public and private property and infrastructure, and environmental protection.

A possible model ordinance outline could be:

- Permit Procedures and Requirements
- Post-Development Stormwater Management Performance Criteria: Water quality, stream channel protection, overbank flooding protection, extreme

flooding protection, structural stormwater controls, stormwater credits for non structural measures, drainage system guidelines, dam design guidelines,
- Construction Inspections of Post-Development Stormwater Management System.
- Ongoing Inspection and Maintenance of Stormwater Facilities and Practices
- Violations, Enforcement and Penalties

Problem #3: Limited sources of potable water.

Solution: Work with local NGOs, local governments and PSAs to create incentives for water conservation by raising PSA rates and/or subsidizing rain barrels and water catchment systems.

Solution: Create a public education campaign about the reasons for conserving groundwater, how to save money by conserving water and the best management practices for rain water filtration and uses.

Solution: Support long range planning. The Department of Environmental Quality requires local planning agencies to create 20-50 year water supply plan for their areas. Local agencies should be supported in this effort with assistance from research institutions. Also, the agencies should reach out to land developers and general public for input.

Other Problems: Many other problems and issues concerning water management were identified, but due to lack of time, could not be discussed in length. They are: implications of water quality and management on wildlife, community-based systems for water and sewer and non point source pollution.

Parking and Transportation

Problem #1: Large parking lots are impediments to pedestrians, are often too large and, thus, breaking with a human-scaled design, creating stormwater runoff issues and increasing the urban heat island effect.

Solution: Design multiuse parking areas. This is recommended for adjacent uses with staggered periods of demand**. IE:** Due to their differing peak parking demand periods, office and retail uses serve as complementary uses.

Solution: Create policy incentives for the use of alternative surfacing materials (high albedo & porous concrete).

Solution: Require parking decks wherein applicable to reduce total parking footprint**.**

Solution: For surface lots- reduce drive aisle widths by using a combination of one-way traffic flow feeding into angled parking stalls.

Solution: Reduce width of two-way drive aisles to 20-feet.

Problem #2: One size fits all regulations

Solution: Local policy makers need to reduce parking ratio to reflect actual parking demand & limit the number of parking spaces required per residential unit.

Solution: Create parking maximums rather than parking minimums to discourage oversupply of parking.

Solution: Reduce parking requirements for buildings located near mass transit.

Solution: Allow parking requirements to be met through the use of on-street parking spaces to help reduce the amount of land devoted to parking.

Problem #3: Not enough adequate public transit options.

Solution: Local planning agencies must broaden the regional transportation system and corporations and other agencies need to support programs like Ride Share.

Solution: Create incentives for corporations and businesses to promote alternative transit options (carpool organization boards, car share programs like ZipCar or rental agencies & preferred parking spaces) and provide facilities for employees to park bikes & shower.

Solution: Public transit providers should incorporate Park and Ride facilities at public transit stations.

Solution: Developers need to reduce the number of parking spaces provided (when allowed) to encourage use of other modes of transportation.

Affordability

Problem #1: There is a poor perception of people who need affordable housing.

Solution: Affordable housing developers must create a public education campaign about the levels of housing need and the high cost of housing in Blacksburg.

Solution: Affordable housing agencies should allow higher ratios of market rate housing while still providing subsidies for the affordable housing components of the development. This strategy would improve the desirability of affordable housing and ensure that the projects to not slide into the traditional decay sometimes associated with concentrated affordable housing projects.

Problem #2: There are problems with student housing in the area. There is an assumption that cheap housing will be taken over by students.

Solution Affordable housing developers must create and enforce stronger deed restrictions for affordable housing units.

Solution: Affordable housing developers must work with the city to develop better restrictions than high parking requirements.

Problem #3: Lack of affordable housing in costly Blacksburg
Solution: Local governments should pass ordinances allowing market rate accessory dwellings (ie: In-law suites). The city ordinance to allow small subordinate accessory dwellings for owner occupants of primary dwellings should be related to size of lot and existing structure. Owners sign occupancy affidavit that expires upon sale.

Solution: Local governmental agencies should provide density bonuses for market rate developments that provide affordable housing. Each development should have limited equity requirements**.**

Density

Problem #1: Perception of density is negative.

Solution: Public education campaign to discuss density misconceptions, challenges and opportunities of density. This education should be targeted towards the general public but also educate elected officials and planning commissions. The content should include visuals and discussion of long range planning implications.

Problem #2: Public infrastructure must be able to accommodate density.

Solution: Long range plans need to identify nodes of density and public funding must be allocated to providing proper infrastructure investments.

Problem #3: Zoning and accessible land can be prohibitive for density.

Solution: The New River District Planning Commission should develop a Transferable Development Right pilot program in a receptive community within its jurisdiction.

Solution: Shorten the review process or decrease fees for developments with higher densities in identified areas.

Solution: Encourage brownfield and infill development.

Development Ordinances

Problem #1: Outdated development requirements unnecessarily increase development impact.

Solution: Better development and zoning ordinances can create less impactful development forms. The New River Valley District Planning Commission should write model ordinances for adoption by local agencies. Some items to consider:

- Frontage – size of lots-Dimensional requirements generates inappropriate development form. Density should be based upon proximity and should be measured as a gross number for the development and flexibility in lot size allowed.
- Road widths- Road widths should be based upon houses served and multiple configurations available.
- Stormwater- See water resources and conservation.
- Common trenching- All electronic utilities should be allowed in one trench. Water and gas and sewer should be allowed in a stacked configuration.
- Mass grading- should be discouraged through steeper allowed road grades. As long as fire access (defined by equipment capability) is possible road grades of 20% historically generate no problems.

Problem #2: The development steps in an innovative community do not often fit the standard order of operations defined by development regulations. (alleys, platting, etc)

Solution: NRVPDC should educate local agencies about innovative community plans. City concerns around developer completion can be addressed by completion bonds.

Problem #3: No flexibility in code

Solution: Explore Duany's Transect and other form based codes

- All codes should be coordinated in one format
  - Building

- Zoning
- Development/Subdivision
- Planning

Solution: Coordination between government offices (local planning, building) and developer and contractor (state – VDOT/DEQ/Health)

Problem #4: Health ordinances restrict the use of greywater. The goal should be to make the treatment and reuse of greywater on-site more prevalent.

Solution: Health Department must be engaged to make regulatory changes and politicians should make the issue imperative.

Solution: The General Assembly should be encouraged to create enabling legislation.

Solution: Local sewer authorities need to resolve sewer billing issues in regards to the reduced contribution to the sewer system.

Solution: Add to building code a requirement for separate piping so that retrofit solutions are more economical.

Solution: Local water authorities should create public and technical educational campaign to foster the development of proper greywater recycling programs when ordinances allow.

Community Design Charrettes Overview

The New River Valley Planning District is undergoing an unprecedented period of development. Community Housing Partners and Floyd Community Properties anticipate setting the standard for the continued development of the area by integrating environmental, cultural, economic, social sustainability technologies and practices into their developments. Indeed, both projects can set the bar for progressive development in Western Virginia and the Southeastern region.

The purpose of the both design charrettes was to discuss, determine and conceptualize, not solely how the project looks and feels but how the buildings, infrastructure and design can perform environmentally, economically and socially.

Each project was scored against the existing EarthCraft Communities (ECC)-Piedmont program criteria; an exercise that confirmed each project's capacity to certify as an ECC community as well as identified areas for further exploration in the development of an ECC mountain program.

The following is a summary of each project's design charrette, conceptual plans and ECC scoring worksheet.

Floyd Eco Village Charrette Overview

This design charrette engaged the development and design team as well as concerned community members to establish specific goals for the project and complimentary design strategies. The team completed an initial scoring exercise and confirmed that the conceptual community design and intended strategies meet the certification requirements of the EarthCraft Communities-Piedmont program. The following is a summary of the design charrette for the Floyd Eco Village.

Site Context

- 2 miles from town center
- Potential trail connection
- Nursing home .5 miles
- 2 miles from school
- Recycling center within 3 miles
- About 3 miles to parkway

Village Goals & Design Strategies

- **Job Creation**

The community will integrate office and commercial uses into the community building and accompanying buildings surrounding the main entrance. The LEED-Silver office building currently under construction by Wall Residences will host several offices. The intent is to provide jobs for the greater Floyd community in an effort to employ the youth of Floyd as well as the provide jobs for the Eco Village residents in an effort to curb long work commutes.

Potential onsite jobs are: rental cabin management, farm management, cooking classes, day care, elderly care, spiritual retreat operations, office work and retail space for community members to sell, display or offer services.

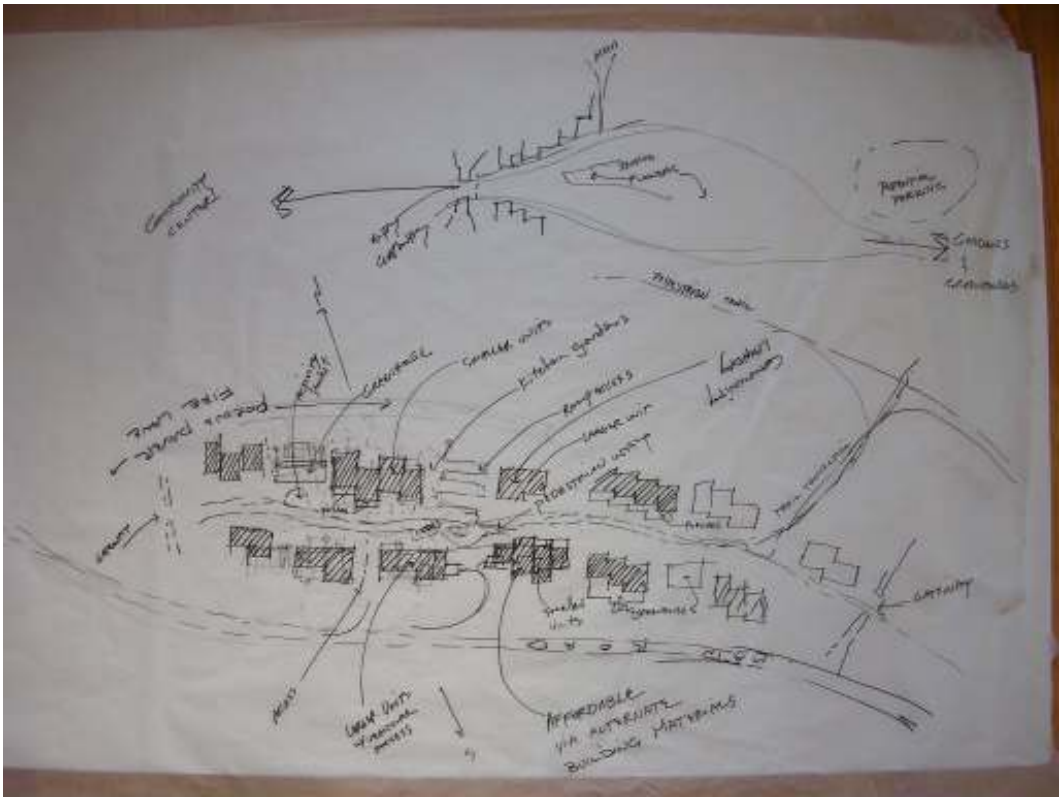
- **Affordability**

The community intends to attract more wealthy retirees as well as a younger population with less income, thus it is essential that the affordability of the residential units be considered by smaller building size (800 sq ft for more affordable units, up to 1,200 sq ft for higher-end units) as well as alternative, natural & local building materials. Locally sourced materials can be utilized for

their environmental responsiveness as well as cost savings. Also, rental units are intended. Some can be in small multifamily dwellings and one in a live/work space above the Franklin Road retail building being considered for just east of the main entrance.

- **Age-in-Place design**

The community is designed to ADA standards throughout and the intent is to design most, if not all, residential units for universal accessibility. The pedestrian way in the central cluster of the houses will be accessible through notable gateways with ramped access to the center.



- **Multi-Generational Community**

Alongside the goal of age-in-place design, the Floyd Eco Village strives to accommodate and welcome residents of all ages, young and old, by providing a

play ground near the community building, building facilities for an on-site daycare & creating a community oriented development at large.

- **Healthy Lifestyles & Fun Atmosphere**

A core value represented in the community design is the resident and visitor's relationship with each other and the Earth. Charrette participants felt strongly that such relationships should be fun and create a healthy lifestyle, thus, the design provides trails for recreation, preserved lands of high-quality soils for onsite food production and the option for aquaculture on-site should development funds be adequate.

- **Closed-loop/ Self Sustaining Community**

The design charrette worked towards balancing land uses with technology to achieve a development layout and plan that supports a self-sustaining community.

The development footprint was restricted to 14 acres (18% of site) and includes the residences, community buildings, office spaces, cabins and barn. Zero lot lines will be used to allow for maximum area of land protected by conservation easement as well as the avoidance of frontage setback requirements and other prohibitive regulations.

A conservation easement will protect 64acres (82% of the site). The following is the breakdown of expected land uses within this conservation easement:

Pasture/Hay/Orchard lands= 40acres (51% of total site)

Agricultural lands=3 acres (4%)

Water storage/Aquaculture ponds = 1 acre (1.3%)

Forest Restoration= 14 acres (18%)

Stream Buffer Restoration= 6 acres (8%)

Other, more technology focused, strategies were discussed with regards to creating a closed-loop community:

Geothermal: Wells have been dug for the LEED office building currently under construction at the entrance of the community and further research must be done to determine the best type of geothermal system to support the HVAC systems of the residential village. It is noted that the waste heat from the geothermal system should be harvested for water heating.

Wind: The team did not discuss the logistics of wind power generation in detail during the design charrette. This is a technological strategy needing further investigation.

Solar: Solar hot water heating is the most efficient use of solar energy and should be considered a priority.

- **Community Education**

The team decided to design a community that educates others about sustainable, community living by inviting surrounding community members and Floyd visitors to the site whenever possible. The team identified three main strategies for outreach: creating an inviting mixed use entrance area, providing rental cabins on the north facing hill and programming the community building strategically. The community building has the potential to offer a professional kitchen area wherein neighbors around Floyd will be able to can and preserve food stuffs for sale.

Once the mixed use entrance and multi-use community building attract people to the village, the buildings themselves (cabins and residential units) are expected to 'push the envelope' with alternative building types, water conservation and wastewater treatment strategies.

Also, it was mentioned that the community wants to offer resources and opportunities not currently offered throughout the Floyd community. The Eco Village intends to be complimentary not redundant with its amenity offerings.

- **Higher Quality of Life for residents**

A core value of the Floyd Eco Village is to increase the quality of life for residents by reducing commutes. This is addressed in several design elements such as: the provision of jobs on site and work spaces wherein artisans and self-employed community members can display their services and goods, connecting the community to the town center with a multiuse trail and providing a space for the storage of community vehicles.

- **Natural landscape & Healthy Environment**

The land was used as pine and Christmas tree farming prior to acquisition, thus the hardwood forests have been badly damaged. The design designates hardwood stands in the northeastern portion of the site for preservation and a significant portion of the land on the southern portion of the site for restoration. Likewise, the design calls for the restoration of the riparian buffer along the creek.

In future iterations of the community design, a community drop-off station for recyclables needs to be sited and regular pick up services scheduled. The composting system will likely be decided and run by community members

- **Wastewater Disposal**

In balancing the costs and environmental impact of wastewater treatment the team decided to utilize a community septic tank and combined drainfield for secondary treatment. The regulatory environment for constructed wetlands is challenging. The team wants to integrate the wetlands into the community

design as secondary treatment; however, the Health Department requires a traditional treatment in place as back up, thus negating any cost savings potential of constructed wetlands.

- **Extensive Water conservation**

One of the developer's main goals was to reduce the need for potable water throughout the community by at least 70%. The team deliberated Floyd's water source issues and decided that a connection to the PSA line 1 mile away is necessary for commercial use and drinking water (approximately 250,000 gallons/ year/ resident). The estimated cost of this connection is $150,000.

Rainwater will be directed from the roofs of all homes into an underground cistern centrally located beneath the pedestrian way between the homes. This water will be used for laundry, flushing toilets and, combined with stormwater and water captured from commercial structure rooftops, will be used to irrigate crops & gardens. The rain water collection is expected to offset the need for potable water by residents and community amenities by 2/3. Other crop irrigation water sources identified were: the construction of ponds on the north facing hill to divert and utilize the stream (supposedly originating from a spring atop the mountain) & agricultural wells (less treatment needed/cost if constructed & used solely for irrigation).

Some challenges identified with this water management system are the allowance and regulations of the PSA for dual water systems (rainwater and PSA line).

Regulatory Challenges

Subdivision Ordinance requires that individual lots have 50 foot frontage to all public roads. This road frontage requirement required the Floyd Community

Properties to design the community as condominiums wherein no lot is owned individually. To make this type of clustered, pedestrian oriented development pattern easier, this ordinance must be analyzed and amended.

Wastewater treatment: The duplicity required to use a constructed wetland system for secondary treatment of wastewater prohibits the use of this low cost and environmentally responsible method of wastewater treatment.

Conclusion & Action Items

The Floyd Eco Village charrette established and explored the intricacies of many goals within the physical and contextual capacities of the property. The conceptual design was able to preserve over 80% of the property in permanent conservation, cluster the housing units around a pedestrian walkway and, in general, create a conceptual community design that respects the natural environment, is productive and supports its members.

There are many design challenges and action items still facing the Floyd Eco Village. The following is a summary of these items.

- The team struggled most with **competing goals** for the development: that of universal design and the other for carbon neutrality as these goals manifest themselves in the physical direct car access to each home. Continued discussion of transit and traffic flows throughout the property is necessary.

- New **Multifamily Regulations** (2006 I.B.C. / I.R.C) must be researched.

- Upgrading of Sam's Road.

- Local greenway organization and adjacent land owners need to be approached to establish physical and legal parameters for the **creation of a direct-access trail** connecting the Eco Village to town through the south west of the property.

- Investigation into the possibility of tapping into the **PSA connection** for potable water source.

- Investigation into the **Corps of Engineers** requirements for creating a pond.

- Investigation into the technical and policy implications of creating **constructed wetlands** for secondary wastewater treatment. (ie: proximity to stream, livestock, fencing required?, etc.)

- Research **streambank restoration** resources. (Conservation Stewardship Program, Environmental Quality Incentives Program)

- Research Management Intensive **Rotational Grazing**. Resources: Joel Salatin (Books available from Acres USA www.acresusa.com) & Appropriate Technology Transfer for Rural Areas www.attra.org.

Harding Avenue Charrette Overview

What do we know? / Issues

- 6% site over 30% grade issues
- 130-200 unit range (5-9 du/AC)
- Gravity Sewer
- Barn – No historic value
- Roads network may be challenging (12% slope for roads)
- Spring house on-site
- Drainageway on-site

- Pump station in Windsor Hills (pumps to peak on Harding, then gravity down to neighborhood on Patrick Henry)
- Capacity in the system – yes, Windsor Hills pump 50% currently
- Extent of public road? What is private?
- What is mysterious hole on site?
- Any Karst? Not really? One borderline area
- Verify internal commercial options in PR Zone district
- Section 3113c: max area for commercial/office uses = 10% gross area of PR district
- Allowed Uses – Daycare, community center
- Extended detention in the low area
- Erosion issues?

Blacksburg Municipal Regulation Issues

- Count on-street parking towards requirements
- -Lower parking ratio for units requirements
- -Allowing higher percent slope for roads
- -Public/private road connections
- -Bike trail water crossings require major mass grading because of storm passage requirements
- -Order of operations
- -Common trenching
- -Outer loop trail connection - $

Excellent Pre-Charrette information was presented. The design team had prepared the following:

Site Model-Cardboard with road layout
Massing blocks- Representing flats, townhomes and duplexes. (from recycled material)
Slope analysis-6% over 30% slope, very little under 15%
Sewage analysis- Adjacent pump station located and capacity confirmed
View Analysis- Views from site and across site in nice large format print
Solar and Wind Analysis- Heating potential identified
Scale tools- Including small scale solar analysis (ala Vitruvius)
Geology- Local GIS source revealed no known Karst. Site coring did not reveal any hidden concerns. Small potential areas were identified and avoided in the design.

Initial Concepts
The massing blocks were useful in engaging participants in a variety of quick options. Initial site analysis was transferred to tracing paper on the site survey. Initial concepts included:

Garden layout with solar orientation: Following the Southwestern border buildings were placed in a solar orientation with triangular greenspace between buildings and street.

Green way layout with separate drives: Traditional development form of the Close was explored without main road frontage. Difficulties of building frontage and private outdoor space were acknowledged.
Picturesque layout: Curvilinear street layout in the Olmsteadian tradition.

Generally speaking the shortcoming of the massing blocks were that desired densities were not obtained and public space considerations were not well understood. Buildings were placed in abstraction and tended to be spread out on all available area. Scale relationships between pedestrians and buildings are difficult to plan without vertical sections. These were analyzed later.

When target unit counts were not reached in initial concepts more traditional layouts were explored. The facilitator asked the participants their favorite vacation cities. Historic cities such as Charleston, Savannah and New Orleans were mentioned. Developments at higher net densities mimic the human scale of the most beloved urban centers. Exercises in higher density yield substantial gains in additional open space. Noting that densities in traditional locales ranged from 12-20 units per acre, the facilitator challenged the participants to utilize only the most accessible portion of the site at 12 units to the acre. Utilizing 12-14 acres at 12 units per would yield 144-168. The other tool present in these centers is a gridded street network

Facilitator lays out a conceptual grid.

As a demonstration of the efficiency these historic layouts a grid of 250' by 400' blocks was laid upon the site following general contour lines. When desired unit count was reached well within the desired development area the rigid grid was adapted to natural features and a more organic response to terrain. The design team quickly and appropriately took the plan toward a more organic network.

The plan evolved to include a parkway main street straddling the sites natural draw. This parkway curves toward the highpoint of the site to allow preservation of the sites only notable tree and to open views to the ridge beyond.

Conceptual layout #8

Lined with the highest density flats this parkway provides the community with its primary public space. This space was designed with a width to height ratio of 7:1 reinforcing a suitable sense of enclosure which is less than an urban core and appropriate for an edge of town community

Secondary streets, with smaller scale housing, follow contours and attention was paid to their alignment so as to create places of distinction for a daycare center and community buildings. Additional site features include community farm and Community Supported Agriculture.

Team Members measure block depths. Fire Safety is also discussed.

Community Goals & Design Strategies

The primary goal of Community Housing Partners is affordable housing across the Area Median Income (AMI) scale. All 10 points available for AMI diversity and rental are achieved. Additional Strategies include:

Site Selection:
Connection and extension of Regional Bike Path

Water Management:
Materials Reuse for erosion control
Elimination of Common area irrigation

Planning and Design:
Street width reduction
Public parking reduction
Mixed Uses with three distinct uses

Preservation Landscape:
Landscape Installation BMP's
Greenspace restoration for preserve area
Habitat protection plan for preserve area

Community Engagement:
Engaging resident with signage and move-in review
Ongoing stakeholder participation beyond incorporation hearings.

Green Buildings
EarthCraft Light commercial for the Daycare center.

Harding Avenue Charette Conclusion and Action Items

The Harding Avenue Project is poised to set the bar for regional development in regards to a variety of community issues. Most obviously, affordable housing but other important issues such as appropriate urban form, greenspace preservation and restoration, and water management.

Touchstone projects like Harding Avenue can be the impetus of change within a region. When properly executed local advocates can point to the success of a project like Harding Avenue and effectively call for change. We look forward to being a part of this successful project.

Obvious next steps include annexation and entitlement. Other not so obvious next steps include: Product development, community systems research and community outreach.

Product development: As a vertically integrated master developer Community Housing Partners will have to worry less about this but the integration of housing product into a final community design is often poorly executed. Housing product is often designed in abstract and engineers rarely understand the interaction of issues such as privacy gradients. Someone with deep experience in site design should be engaged to ensure proper community relationships prior to completion of the final design.

Community systems research: The stormwater path in the open space of the parkway and its potential to demonstrate the community value at the intersection of Green, Gray and Social infrastructure is an opportunity not to be missed. Graduate level workshops or competitions at Virginia Tech and other schools may inspire an advanced design worthy of its potential.

Community outreach: While a requirement of the annexation and entitlement process, community outreach should be looked upon as an opportunity rather than a burden. Engaging the community early and often allows time for support to build and concerns to be addressed.

Conclusion & Next Steps

It is important that all the local sustainability issues discussed by workshop participants are re-visited as opposed to opening the floor for more topics at this stage. The technical issues related to each identified problem should be further researched and specific individuals and agencies whose has authority over the specific problem (ie: Floyd County Commissioner, City of Blacksburg city governance, NRVPDC) must be identified. Once identified, the parameters and processes for creating model ordinances for the region must be discussed in order to evaluate the receptive of all stakeholders. NRVPDC should take responsibility for researching and distributing existing applicable ordinances as well as peer advocates.

Harding Avenue
Earthcraft Communities Scoring

EARTH CRAFT™ COMMUNITIES

Sensibly Built for the Environment

PIEDMONT CERTIFICATION WORKSHEET

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Mail:	**EarthCraft Communities**
	241 Pine Street N.E.
	Atlanta, GA 30308
Fax:	**404-872-5009**
Email:	**ccorley@southface.org**
Phone:	**(404) 872-3549**
Community Name:	Harding Avenue
Community Address:	Harding Avenue
Community GPS:	
Devel. Group Name:	
Devel. Group Address:	
Contact Person:	
Contact Phone:	
Contact Fax:	
Contact E-mail	
Land Planner Name:	
Landscape Architect:	
Civil Engineer:	

Date:

Total Acres		**Dwelling units per acre**		**Square footage of Impervious**	
Multifamily		**Square footage of LEED Buildings**		**Linear feet of Ped/Multi Use Path**	
Single family Attached		**Square footage of Earth Craft LC**		**Commercial square footage**	
Single family detached		**Acreage of Greenspace**		**Civic use square footage**	
Residential Units		**Square footage of Pervious**		**Development Classification**	

Documentation needed: ○ Documentation Collected: ●

	Points	Score	Narrative and Notes	Site Plan	Narratives	Verification Doc	Calculation	Inspection
SITE SELECTION								
Threshold: Regional Plans	x	2	Area is inside urban		○			
Brownfield Redevelopment	5				○	○○		
Greyfield Redevelopment	3				○			
Infill Development -- 25%	2	2	2 sides and across	○				
Infill Development -- 90%	3			○				
Activity Center Location	2			○	○			
Transit Orientation – Existing Local Bus	3	3	BT Blacksburg Transit	○				
Transit Orientation – Planned/Funded Local Bus	2			○	○	○		
Transit Orientation- Existing Rail/Rapid Transit	4			○				
Transit Orientation-Planned Rail/Rapid Transit	3			○	○	○		
Proximity to Regional Bike Path - Existing	3			○				
Proximity to Regional Bike Path - Planned/Funded	2	2	Bike Path is planned	○	○	○		
Jobs/Housing Balance	4				○		○	
SITE SELECTION TOTAL	36	9						

WATER MANAGEMENT								
Threshold: Construction BMPs	x	1		○	○			
Threshold: On-call Personnel	x	1			○			
Threshold: Post-Construction BMPs	x	1		○	○○			○
Threshold: Turbidity Testing	x	1			○○		○	○
Threshold: No Septic Systems	x	2			○			
Minimize Mass Grading	4		May not get due to	○				○
Materials Reuse- Erosion Control	2	2	Grind on Site and		○	○		○
Vehicle Wash Station	1	1	Blacksburg Reqment	○	○○			○
Runoff Volume Reduction	4			○		○○	○	
Water Conservation- Common- Reduce	2			○○	○	○	○	○
Water Conservation- Common- Eliminate	4	4	No irrigation	○○	○	○○	○	○
Water Conservation- Private	5		Conduct survey of		○○			○
WATER MANAGEMENT TOTAL	***22***	13						
PLANNING AND DESIGN								
Threshold: Site Analysis and Planning	x	2	**Site Analysis and**	○	○			
Site Plan				○				
Topography and Aspect				○				
Soil Series				○				
Historic, Cultural & Archeological Resources				○				
Tree Survey w/ Vegetative Cover and Unique Landscapes				○				
Sensitive Wildlife Habitat Areas				○				
Hydrological Study				○				
Aerial Photo of Property				○				
Viewshed Analysis				○				
Solar and Wind Access Analysis				○				
Threshold: Integrated Design	x	1			○			○
Threshold: Bicycle Accommodations	x	1		○○	○			○
Threshold: Pedestrian Accommodations	x	1		○○	○			○
Threshold: Connectivity	x	1		○○	○			○
Internal Connectivity	3	3	V DOT Node Link	○○	○		○	○
Ped/Bike Paths- create	1	1		○○	○			○
Ped/Bike Paths- connect to existing off-site	1	1	Connect careful	○○	○			○
Hearing and Sight Impaired Accommodations	1	1	Trun carted doames at	○	○			○
Bike Lanes	2			○○	○			○
Traffic Calming Design	3	3		○○	○	○		
Street Width – Reduced below local	2			○○	○	○○		○
Street Width – 75% designed to EC specs	3	3	PUD Will allw	○○	○	○○	○	○
Street Trees	3	3		○○	○	○	○	
Public Parking -Reduce below local	2	2	Tenative reduction		○	○		○
Public Parking -Preferred space	1	1		○	○			○
Private Parking	3			○○	○		○	
Density	3	3		○○	○		○	
Mixed Use - Development for two distinct uses	2	2	Day care	○○	○○			
Mixed Use - Development for three distinct uses	1	1	Farm for sale	○○	○○			
Mixed Use- Development for four distince uses	1			○○	○○			
Mixed Use- Development for five distince uses	1			○○	○○			
Mixed Use- Development for six distince uses	1			○○	○○			
Civic Use	2			○○				
Housing Diversity -- under 60% AMI	3	3		○	○		○	

Housing Diversity -- 61-80% AMI	2	2		○	○		○	
Housing Diversity -- 81-100% AMI	2	2		○	○		○	
Housing Diversity -- 101-120% AMI	1	1		○	○		○	
Housing Diversity - Rental	2	2		○	○		○	
Housing Diversity - Section 8	1			○	○		○	
Community Center - Common facility	3	3		○○	○	○		○
Community Center - Intranet	1				○○			○
Adaptive Reuse	2			○○	○			○
Adaptive Reuse -- Historic Preservation	1			○○	○	○		○
PLANNING AND DESIGN TOTAL	***54***	43						
PRESERVATION LANDSCAPE								
Threshold- Greenspace	x	3		○○	○			○
Threshold- Landsape Installation- Mimic	x	1			○	○		
Construction Phasing	1	1		○○	○○			○
Minimize Clear Cutting- 25%	2			○	○			○
Minimize Clear Cutting- 50%	3			○	○			○
Minimize Clear Cutting- Replant 25%	1			○	○	○		○
Utilities Installation- Reduce Disturbance	2				○○			
Utilities Installation- Install prior	1	1			○○			
Landscape Installation- Restore	1	1		○	○○	○		
Landscape Installation- Grind Stumps	1	1			○	○		
Landscape Installation- Organic Fertilizers	1	1			○	○		
Onsite Greenspace Preservation -- Tier 1	2	2	Could be more	○○	○	○	○	○
Onsite Greenspace Preservation -- Tier 2	3			○○	○	○	○	○
Onsite Greenspace Preservation -- Tier 3	4			○○	○	○	○	○
Offsite Greenspace Preservation	3				○○	○		
Greenspace Restoration	3	3	Area below Sewer	○○	○	○		
Habitat Protection Plan	3	3	Joshua Galloway	○○	○	○		
Tree Preservation -- Building With Trees	1			○○	○○	○		○
Tree Preservation -- Design Adjustments	2	2	One tree at front	○○	○○	○		○
Tree Preservation -- Specimen Trees	1			○○	○○	○		○
Tree Preservation -- Culturally-Signficant Trees	1			○○	○○	○		○
Tree Preservation- Association Controls	1				○	○		
Tree Transplanting	2				○	○		○
Materials Reuse- Construction and Energy	2				○○			
Water Quality Buffers -- Streams	3	3		○○	○○			○
Water Quality Buffers -- Wetlands	2			○○	○○			○
Stream Crossings	2			○○	○○	○		○
Community Gardens -- Preserve	1			○○	○	○○	○	○
Community Gardens -- Construct	2	2	1 1/2 acre set aside	○	○○	○○	○	○
PRESERVATION LANDSCAPE TOTAL	***51***	24						

COMMUNITY ENGAGEMENT								
Threshold: Community Participation	x	2			○	○		
Threshold: Neighborhood Association	x	2			○○	○		
Threshold: Covenants, Codes, and Restrictions	x	1			○	○		
Threshold: Environmental Education Coordinator	x	1			○○			
Threshold: Environmental Education - Public	x	1			○	○		
Community Stakeholder Participation - Ongoing	1	1	Need to develop		○○			
Environmental Education – Resident, Move-in review	2	2	Handbook		○○			
Environmental Education – Resident, Signage	2	2	Need evidence on plan		○○			○
Environmental Education – Government, Attempt	2	2	Utilities Blacksburg V		○○	○		
Environmental Education – Government, Success	3				○○	○		
Community-Based Recycling – Facility	3	3	Non Curbside	○○	○○			○
Community-Based Recycling - Composting	2	2	Set up at Community	○○	○○			○
P2AD Partnership	1				○	○		
COMMUNITY ENGAGEMENT TOTAL	***16***	19						
GREEN BUILDING								
Threshold: EarthCraft House	x	5			○	○		○
Threshold: EarthCraft Multifamily -- Low-Rise	x	5			○	○		○
EarthCraft Renovation	3				○	○		○
EarthCraft for Light Commercial	4	4	Day care		○	○		○
Green Building Certification	4				○	○		○
District Heating/Cooling	6			○○	○○			
Distributed Renewable Energy	7			○	○			
Clean Emissions Protocol for Heavy Equipment	2		Double check		○	○		
Reuse of Existing Structures	2				○○	○		
GREEN BUILDING TOTAL	***28***	14						
INNOVATION								
Innovation points	5							
INNOVATION POINTS TOTAL	***5***	0						
EARTHCRAFT COMMUNITIES TOTALS								
SITE SELECTION	36	9						
WATER MANAGEMENT	22	13						
PLANNING AND DESIGN	54	43						
PRESERVATION LANDSCAPE	51	24						
COMMUNITY ENGAGEMENT	16	19						
GREEN BUILDING	28	14						
INNOVATION	5	0						
GRAND TOTAL NEEDED	**100**	**122**	***GRAND TOTAL COLLECTED***					

Floyd EcoVillage

Earthcraft Communities Scoring

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	Atlanta, GA 30308
Fax:	**404-872-5009**
Email:	**ccorley@southface.org**
Phone:	**(404) 872-3549**
Community Name:	Floyd Eco Village
Community Address:	
Community GPS:	
Devel. Group Name:	
Devel. Group Address:	
Contact Person:	
Contact Phone:	
Contact Fax:	
Contact E-mail	
Land Planner Name:	
Landscape Architect:	
Civil Engineer:	

Date:

Total Acres		**Dwelling units per acre**		**Square footage of Impervious**	
Multifamily		**Square footage of LEED Buildings**		**Linear feet of Ped/Multi Use Path**	
Single family Attached		**Square footage of Earth Craft LC**		**Commercial square footage**	
Single family detached		**Acreage of Greenspace**		**Civic use square footage**	
Residential Units		**Square footage of Pervious**		**Development Classification**	

Documentation needed: ○ Documentation Collected: ●

	Points	Score	Narrative and Notes	Site Plan	Narratives	Verification Doc	Calculation	Inspection
SITE SELECTION								
Threshold: Regional Plans	x	2	Comprehensive		○			
Brownfield Redevelopment	5				○	○○		
Greyfield Redevelopment	3				○			
Infill Development -- 25%	2			○				
Infill Development -- 90%	3			○				
Activity Center Location	2			○	○			
Transit Orientation – Existing Local Bus	3			○				
Transit Orientation – Planned/Funded Local Bus	2			○	○	○		
Transit Orientation- Existing Rail/Rapid Transit	4			○				
Transit Orientation-Planned Rail/Rapid Transit	3			○	○	○		
Proximity to Regional Bike Path - Existing	3			○				
Proximity to Regional Bike Path - Planned/Funded	2	2	We want to	○	○	○		
Jobs/Housing Balance	4				○		○	
SITE SELECTION TOTAL	36	4						

WATER MANAGEMENT								
Threshold: Construction BMPs	x	1		○	○			
Threshold: On-call Personnel	x	1			○			
Threshold: Post-Construction BMPs	x	1		○	○○			○
Threshold: Turbidity Testing	x	1			○○		○	○
Threshold: No Septic Systems	x	2	No individual onsite.		○			
Minimize Mass Grading	4	4	Large land in	○				○
Materials Reuse- Erosion Control	2	2	Using mulch from		○	○		○
Vehicle Wash Station	1	1	David says he has a	○	○○			○
Runoff Volume Reduction	4	4	Permeable roads,	○		○○	○	
Water Conservation- Common- Reduce	2	4		○○	○	○	○	○
Water Conservation- Common- Eliminate	4		Wells and stormwater	○○	○	○○	○	○
Water Conservation- Private	5				○○			○
WATER MANAGEMENT TOTAL	***22***	21						
PLANNING AND DESIGN								
Threshold: Site Analysis and Planning	x	2	**Site Analysis and**	○	○			
Site Plan				○				
Topography and Aspect				○				
Soil Series				○				
Historic, Cultural & Archeological Resources				○				
Tree Survey w/ Vegetative Cover and Unique Landscapes				○				
Sensitive Wildlife Habitat Areas				○				
Hydrological Study				○				
Aerial Photo of Property				○				
Viewshed Analysis				○				
Solar and Wind Access Analysis				○				
Threshold: Integrated Design	x	1			○			○
Threshold: Bicycle Accommodations	x	1	Bike racks needed at	○○	○			○
Threshold: Pedestrian Accommodations	x	1	Pedestrian way	○○	○			○
Threshold: Connectivity	x	1		○○	○			○
Internal Connectivity	3			○○	○		○	○
Ped/Bike Paths- create	1	1		○○	○			○
Ped/Bike Paths- connect to existing off-site	1	1	Existing trail extension	○○	○			○
Hearing and Sight Impaired Accommodations	1	1	Universal design / age	○	○			○
Bike Lanes	2			○○	○			○
Traffic Calming Design	3	3	Limited car access	○○	○	○		
Street Width – Reduced below local	2	2	24 foot on paving and	○○	○	○○		○
Street Width – 75% designed to EC specs	3			○○	○	○○	○	○
Street Trees	3			○○	○	○	○	
Public Parking -Reduce below local	2				○	○		○
Public Parking -Preferred space	1	1		○	○			○
Private Parking	3	3	Shared parking with	○○	○		○	
Density	3	3	6 units to the acre	○○	○		○	
Mixed Use - Development for two distinct uses	2	2	office, commercial,	○○	○○			
Mixed Use - Development for three distinct uses	1	1	agricultural	○○	○○			
Mixed Use- Development for four distince uses	1	1	daycare	○○	○○			
Mixed Use- Development for five distince uses	1			○○	○○			
Mixed Use- Development for six distince uses	1			○○	○○			
Civic Use	2			○○				
Housing Diversity -- under 60% AMI	3			○	○		○	

Housing Diversity -- 61-80% AMI	2	2		○	○		○	
Housing Diversity -- 81-100% AMI	2	2		○	○		○	
Housing Diversity -- 101-120% AMI	1			○	○		○	
Housing Diversity - Rental	2	2		○	○		○	
Housing Diversity - Section 8	1			○	○		○	
Community Center - Common facility	3	3		○○	○	○		○
Community Center - Intranet	1	1			○○			○
Adaptive Reuse	2			○○	○			○
Adaptive Reuse -- Historic Preservation	1			○○	○	○		○
PLANNING AND DESIGN TOTAL	***54***	35						
PRESERVATION LANDSCAPE								
Threshold- Greenspace	x	3		○○	○			○
Threshold- Landsape Installation- Mimic	x	1			○	○		
Construction Phasing	1			○○	○○			○
Minimize Clear Cutting- 25%	2			○	○			○
Minimize Clear Cutting- 50%	3	3		○	○			○
Minimize Clear Cutting- Replant 25%	1			○	○	○		○
Utilities Installation- Reduce Disturbance	2				○○			
Utilities Installation- Install prior	1	1			○○			
Landscape Installation- Restore	1	1		○	○○	○		
Landscape Installation- Grind Stumps	1	1			○	○		
Landscape Installation- Organic Fertilizers	1	1			○	○		
Onsite Greenspace Preservation -- Tier 1	2			○○	○	○	○	○
Onsite Greenspace Preservation -- Tier 2	3			○○	○	○	○	○
Onsite Greenspace Preservation -- Tier 3	4	4	82% is publicly	○○	○	○	○	○
Offsite Greenspace Preservation	3				○○	○		
Greenspace Restoration	3	3		○○	○	○		
Habitat Protection Plan	3	3		○○	○	○		
Tree Preservation -- Building With Trees	1			○○	○○	○		○
Tree Preservation -- Design Adjustments	2	2	cabin siting and use of	○○	○○	○		○
Tree Preservation -- Specimen Trees	1			○○	○○	○		○
Tree Preservation -- Culturally-Signficant Trees	1			○○	○○	○		○
Tree Preservation- Association Controls	1	1			○	○		
Tree Transplanting	2				○	○		○
Materials Reuse- Construction and Energy	2				○○			
Water Quality Buffers -- Streams	3	3		○○	○○			○
Water Quality Buffers -- Wetlands	2			○○	○○			○
Stream Crossings	2		Will have to	○○	○○	○		○
Community Gardens -- Preserve	1	1		○○	○	○○	○	○
Community Gardens -- Construct	2	2		○	○○	○○	○	○
PRESERVATION LANDSCAPE TOTAL	***51***	30						

COMMUNITY ENGAGEMENT								
Threshold: Community Participation	x	2			○	○		
Threshold: Neighborhood Association	x	2			○○	○		
Threshold: Covenants, Codes, and Restrictions	x	1			○	○		
Threshold: Environmental Education Coordinator	x	1			○○			
Threshold: Environmental Education - Public	x	1			○	○		
Community Stakeholder Participation - Ongoing	1	1	Direct access trail to		○○			
Environmental Education – Resident, Move-in review	2	2			○○			
Environmental Education – Resident, Signage	2				○○			○
Environmental Education – Government, Attempt	2	2			○○	○		
Environmental Education – Government, Success	3				○○	○		
Community-Based Recycling – Facility	3	3		○○	○○			○
Community-Based Recycling - Composting	2	2		○○	○○			○
P2AD Partnership	1				○	○		
COMMUNITY ENGAGEMENT TOTAL	***16***	17						
GREEN BUILDING								
Threshold: EarthCraft House	x	5			○	○		○
Threshold: EarthCraft Multifamily -- Low-Rise	x	5			○	○		○
EarthCraft Renovation	3				○	○		○
EarthCraft for Light Commercial	4				○	○		○
Green Building Certification	4	4			○	○		○
District Heating/Cooling	6	6	Geothermal lines	○○	○○			
Distributed Renewable Energy	7			○	○			
Clean Emissions Protocol for Heavy Equipment	2		Newer equipment		○	○		
Reuse of Existing Structures	2				○○	○		
GREEN BUILDING TOTAL	***28***	20						
INNOVATION								
Innovation points	5							
INNOVATION POINTS TOTAL	***5***	0						
EARTHCRAFT COMMUNITIES TOTALS								
SITE SELECTION	36	4						
WATER MANAGEMENT	22	21						
PLANNING AND DESIGN	54	35						
PRESERVATION LANDSCAPE	51	30						
COMMUNITY ENGAGEMENT	16	17						
GREEN BUILDING	28	20						
INNOVATION	5	0						
GRAND TOTAL NEEDED	**100**	**127**	***GRAND TOTAL COLLECTED***					

APPENDIX B:

Regional Action Items defined through Sustainable Blacksburg Week Land Development Workshop

(October 2007)

AND

Southface Earthcraft Communities Workshop

(May 2008)

Sustainable Land Development Community Forum

Identified Issues to Resolve to Move Sustainable Land Development Practices Forward for the Region:

1) **Creation of supplemental Sustainable Land Development Criteria for Southwest Virginia**
    a. Problem
        i. There is no development criterion in existence that captures environmentally and culturally sustainable development practices for the mountain region of Southwest Virginia that communities are voicing the need for. While the 3rd party programs provide a solid base to work from, it is difficult to widely promote development "best practices" without having studied it for our region.

    b. Task
        i. Create development criterion as identified at the Sustainable Land Development workshops:

            1. Geology (Karst and other geologically specific formations)and storm water runoff
            2. Septic Tanks/Sewer within different geological/soil environments
            3. Wildlife/Ecological Systems
            4. Drought/Fire Impacts on development in transition lands
            5. Connectivity-Green Infrastructure in Landscape
            6. Steep Slope and Viewshed Preservation
            7. Groundwater Recharge/Drought

            Other Identified criteria needs that capture energy and economic efficiency challenges are:

            8. Rural Southwest Virginia Landscapes-Density and Scale
            9. Common Trenching
            10. Water Conservation and Reuse Issues: Rainwater/Greywater/Blackwater
            11. Transportation (Parking/Mass Transit/Alternative Transportation)
            12. Encouraging Alternative Energy Use in an area with "cheap energy from abundant coal resources"

    c. EXAMPLES of Proposed Action Item Ideas
        a. Create a WORKING roundtable of diverse stakeholders that moves forward the concept of "best practices" or regional supplemental development criteria.
        b. Partner with local developers who are doing green development practices already to evaluate some of the proposed supplemental criteria within ongoing projects. Not made public. A part of this smaller group to evaluate what is to test the feasibility from the economic/developer perspective.
        c. Using a pilot project site plan, evaluate what components of a 3rd criteria program are possible under current zoning/subdivision.

2) Evaluate the delivery process needed to implement sustainable land development at the local level.

a. Problem:
   i. The way current local and state processes are set up, some of the proposed development principles are difficult to implement based on local review processes. Additionally, there is no mechanism within local code for developers to test progressive or new sustainable development ideas. We need a process that the end result is that "green developments" are easier to do than traditional development practices. The process created **must** address the economic realities of development whether it is through incentives, by-right, 3rd party programs, etc.

b. Task
   i. Evaluate current land development review processes and discuss what approaches are most promising for implementation.

c. EXAMPLES of Proposed Action Item Ideas
   i. Develop an incentive process that could supplement 3rd party program use
   ii. Review and revise local processes and codes that ultimately would make it easier to do a sustainable land development than traditional development.
   iii. Begin to develop other land use implementation tools and incentives for our area such as Purchase of Development Rights, Transfer of Development Rights, etc.

3) Connectivity of Open Space in the Landscape(Green Infrastructure)

a. Problem:
   i. Fragmentation of a region's green infrastructure diminishes the ecosystem services performed (water storage and filtration, biodiversity, carbon storage, etc). Open spaces must be connected to one another.
   ii. Regional connectivity for recreation, wildlife habitat, preservation of open space is not a priority in new land development subdivisions and little coordination exists across local government boundaries
   iii. Fragmentation of a region's green infrastructure reduces economies of scale that make possible and profitable forestry, agriculture, restoration, and related management practices needed to sustain ecological health.

b. Task
   i. Identify barriers and opportunities to promoting contiguous open spaces.
   ii. Identify processes that would allow conservation development subdivisions to locate their open spaces in ways that maximize contiguous regional open space. I.e. Identify a mechanism to link regional open space planning efforts to parcel level subdivision development.
   iii. Identify existing Virginia regional programs and suggest how these can be incorporated into the local level planning process.

c. EXAMPLES of Proposed Action Item Ideas
   i. Develop sample regional planning policies and incentives that identify and encourage contiguous open spaces.
   ii. Develop sample Earthcraft criteria and incentives within a process that identifies and encourages contiguous open spaces.

4) Land management issues associated with community owned open space

a. Problem:

i. Conservation subdivisions/Cluster developments are proposed as a subdivision design that maintains rural character. There are a number of management issues and problems that are associated with open space located within conservation subdivisions. Some of the identified problems include: home owner expectations with property turnover, implementation/lack of long term management plans, finding economically feasible models for open space management -that is keeping with their rural character (forestry, agriculture) to jobs, tax revenues, and regional economic vitality….

b. Task

i. List opportunities and concerns for open space management in conservation subdivisions.
ii. Discuss different land management models for conservation subdivisions.
iii. Propose potential solutions that encourage or at allow active management of open space.

c. EXAMPLES of Proposed Action Item Ideas

i. Evaluate different land management models for conservation subdivisions.
ii. Develop sample planning policies that encourage or at allow active management of open space
iii. Develop sample EarthCraft criteria and incentives that encourage or at allow active management of open space.

5) Incorporating agriculture into residential and mixed use developments

a. Problem

i. Residential and mixed-use developments are typically separated from agriculture and food production. Over time this has lead to a variety of problems including:
    1. Loss of working farm land and the natural services provided through its open space state
    2. Lack of subdivision and farming models to reduce the need to transport food long distances from where it is grown to where it is consumed
    3. No economic incentive for farmer to keep as working farm land
    4. A lack of food security resulting in potential food contamination
    5. Conflicts between agricultural land use and residential homeowner expectations as areas develop around remaining farms

b. Task

i. Identify groups and programs that are interested in promoting agriculture within communities
ii. Discuss model agricultural subdivision models
iii. Identify local zoning and other code issues that hinder the inclusion of agriculture and farming in developments
iv. Identify incentives and other models that would be applicable to region

c. EXAMPLES of Proposed Action Item Ideas

i. Create sub-group of working round table that moves forward the concept of incorporating agriculture into residential and mixed use developments
ii. Examine other developments that have incorporated agriculture and farming and identify issues and best practices
iii. Recommend incentives for including agriculture in residential and mixed use developments

6. **Rural Southwest Virginia Landscapes –Density/Smart Growth**
    a. Problem
        i. The population of Southwest Virginia is growing and dense developments are not widely favored by the public. Density is not understood as a sustainable method for land development. Many communities may wish to be green and profess wanting smart growth, but when the common principles of smart growth are exercised (e.g. density), the community rejects those principles in mass..the concept of not in my backyard but yours is ok.

    b. Task
        i. Defining and discuss what "Smart Growth" and "Sustainability" means to our communities in rural Southwest Virginia.
        ii. Suggest ways in which the region can educate policy-makers and the public on the benefit of density in relation to the benefits it can afford (affordability, open space preservation, reduce sprawl, etc).
        iii. Find ways in which the region can encourage density as an incentive to sustainable land development.

    c. EXAMPLES of Proposed Action Item Ideas
        i. Density can be encouraged through the use of incentives if properly planned on a regional level where specific growth areas. Identify these regional growth areas and provide density incentives for sustainable developments in these areas.
        ii. Develop a series of Forums for the Community on Smart Growth that represents perspectives of different stakeholders in the development process

7. **Affordability**
    a. Problem
        i. Sustainable Land Development is not cheap. It is usually more costly to build environmentally sound infrastructure and energy efficient homes. It is because of this it creates communities that only wealthy individuals can afford to live there. How do we grow in an environmentally sound manner while not creating elite communities?
    b. Task
        i. Identify challenges associated with affordable housing and environmental friendly housing
        ii. Investigate different types of incentives to address affordable housing in sustainable land development models

    c. EXAMPLES of Proposed Action Item Ideas
        i. Create a working group to move forward issues

8. Transportation

a. Problem

i. Due to its rural nature, Southwest Virginia does not have a wide variety of alternative travel or mass transit options available beyond the Single Occupancy Vehicle. Density and rural population development patterns make it difficult to provide economical and appropriate forms of alternative transportation options. Other issues include:

1. Costs associated with providing pedestrian facilities or alternative transportation accommodations become an affordability issue;
2. Localities have no alternative transportation policies set in place for future developments;
3. Overall lack of incentives for developers to provide alternative transportation requirements

b. Task

i. Identify various alternative transportation strategies that support sustainable land development patterns

ii. Identify issues involved with establishing rural transportation shuttles delivering people to towns/communities with transit services

b. EXAMPLES of Proposed Action Item Ideas

i. Explore ride-share program incentives for developments establishing a program.

ii. Investigate incentives for trail/bike lane connectivity and other alternative transportation planning options within local development processes-parking requirements, etc.

Appendix C: Sustainable Land Development Community Forum Results

August 27th, 2008

Proposed Action Items to Move
Sustainable Land Development Practices Forward for the Region:

1) **Creation of supplemental Sustainable Land Development Criteria for Southwest Virginia**
    a. Members
        i. Facilitator: Mary Ann Hitt
        ii. Members: Regina Elsner, Joey Fagan, Chris Lawrie, Erica Adams

    b. Proposed Action Item Ideas (No party identified to move forward)
        a. Develop a process for communities to identify what sustainable criteria are important to them and consider supplementing 3rd party criteria.
            1) Supplementing 3rd party criteria with our local targets for sustainability: overcoming mass transit challenges, incorporating management of open space, creating appropriate stream buffers, karst, protecting ridgelines, etc.
            2) Linking regional plans with local site development
            3) Make data available to local governments and developers to properly inform decisions at the site level.
            4) Partner with local developers who are doing green development practices already to evaluate some of the proposed supplemental criteria within ongoing projects.

2) **Evaluate the delivery process needed to implement sustainable land development at the local level.**
    a. Members
        i. Facilitator: Leslie Hager-Smith
        ii. Members: Elisabeth Vogel, Annie Guppy, Jack Wall, Jennifer Wilsie, Nichole Hair, Carole Lindstrom, Ken McFadyen
    b. Proposed Action Item Ideas (No party identified to move forward)
        i. Develop a regionally organized education/advocacy program involving local key stakeholders: locality staff, state staff, citizens, businesses/private sector, realtors, VT planning, realtors, planning commissions, school boards and regional subgroups. Utilize a bottom up concept that will translate politically.
        ii. Provide incentives that are adaptable to multiple localities.
            1. Educate developers on the marketability of sustainable practices and to encourage life cycle analysis as part of the marketing.
            2. Local governments to develop an incentive system for sustainable practices
        iii. Create a Regional Research working group to create a database, library, etc. of best practices. This will provide a base for discussions to educate, discussions on cultural norms, political and government policies to then investigate incentives.

3) **Connectivity of Open Space in the Landscape(Green Infrastructure)**

    a. Members
        i. Facilitator: Laura Belleville
        ii. Participants: Joshua Galloway, Chad Adkins, Barry Helms, Paul Revel

b. Proposed Action Item Ideas
    i. Create a map to identify open spaces/natural assets (Green Infrastructure Partnership/PDC)
        1. Require comp plans to include these assets, organize by watersheds, create incentives for developers to incorporate into sites, get state funding to the Dept. of Natural Resources to create the maps, educate the public to gain acceptance of ecological-based open spaces/natural assets.
    ii. Encourage state law to require localities to incorporate regional natural assets into their plans and enforcement
        1. Develop fees or incentives for natural assets in the review process
        2. Conduct an environmental site review
        3. Build flexibility into codes to allow for conservation/cluster developments
        4. Demonstrate economic viability of cluster developments and educate consumers
        5. PDC to coordinate these concepts across all localities and assist with environmental reviews.
    iii. Important programs to be involved: Earthcraft Communities, Green Infrastructure Center, DCR Fish and Wildlife, VOR. Good examples to follow are Hampton Roads PDC and Va Beach PDR program.

4) Land management issues associated with community owned open space, Incorporating agriculture into residential and mixed-use developments.

a. Members
    i. Facilitator: Meghan Dorsett
    Members: Debbie Lineweaver , Charlotte Hanes, Jerry Moles, Dave Rundgren, Kamala Bauers, Kay Paver, Diane Zahm, Evan Bowditch, Courtney Kimmel

b. Proposed Action Item Ideas
    i. Evaluate different land management models/ordinances to incorporate community gardens/food agricultural uses into land development. (Kamala Bauers and Kay Paver to investigate).
    ii. Create agricultural/residential districts that allow both to work together.
    iii. Create a public information program to link residents to local farming, coops, CSA's, and jobs related to agricultural industry. (Diane Zahm and Evan Bowditch to investigate).
    iv. Develop an incubator program that assists with market strategies, equipment loans, business plans, seed money, etc. (Courtney Kimmel to investigate).
    v. Create a website for local green products: food, bioenergy, forestry, etc.
    vi. Develop sample planning policies that encourage or at allow active management of open space.

6. Rural Southwest Virginia Landscapes –Density/Smart Growth

a. Members
    i. Facilitator: Abigail Convery
    ii. Participants: Blaine Keesee, Derrick Myers, Peter Ozolins, Pat Bixler

b. Proposed Action Item Ideas
    i. Provide a Citi-fication (urban view) of the codes for towns like Blacksburg to accommodate density in the appropriate areas (Comment on during upcoming Blacksburg zoning comment periods).
    ii. Change the negative perception of density with the public through a series of articles in the NRV Current (not assigned), through field trips for developers to urban redevelopment projects (Peter Ozolins).
    iii. Develop a series of Forums for the Community on Smart Growth that represents perspectives of different stakeholders in the development process. (YMCA at Virginia Tech).

7. **Affordability**
    a. Members
        i. Facilitator: Anne McClung
        ii. Participants: Susan Anderson, Tim Colley, Daniel Breslau, James Ruhland, Meredith Jones

    b. Proposed Action Items (No parties identified to move forward)
        i. Encourage public/private partnerships with land in desirable, developable areas.
        ii. Provide education on long term costs and benefits of sustainable development: affordability is a life-cycle cost that needs to be part of the market.
        iii. Investigate the relationship of density/mixed-use to affordability and use bonuses as incentives
        iv. Encourage local governments to have a "green label" for homes or recognition programs to help educate consumers.
        v. Provide a governance structure that favors sustainability and affordability in the long term.

8. **Transportation**
    a. Members
        i. Facilitator: Kevin Byrd
        ii. Participants: Don Langreher, Kim Steika, Angela Parrish, David Zachow

    b. Proposed Action Item Ideas
        i. Add park and Ride lots (VDOT/PDC)
        ii. Create an action group for exploring mass transit expansion in areas where it currently exists, or in areas more urban where it could exist
        iii. Explore ride-share program incentives for developments establishing a program through the use of a Rideshare Message Board. (PDC)
        iv. Provide incentives for trail/bike lane connectivity through local development processes and a Regional Bikeway/Walkway Plan
        v. Encourage safe routes to school