

Town of Cabot, Vermont

Green Infrastructure/Low-Impact Development Review

February 2014

Low Impact Development (LID) is an innovative land planning and engineering design approach which seeks to maintain a site's pre-development ecological and hydrologic function through the protection, enhancement, or mimicry of natural processes." LID is considered a non-structural practice used predominantly to guide new development. At its core, LID focuses on minimizing the impacts of development. In doing so, LID mitigates problems before they start. There are generally eight principles of LID (outlined at right). When incorporated as part of the planning process, the result is wetland and riparian habitat protection, reduction of peak runoff flow and rate through the reduction of impervious surfaces, reduced risk of flooding, improved community value and aesthetics, and long-term cost savings from reduced water infrastructure maintenance.



Infiltrate

Evaporate

Recycle

When the impacts of development on a site cannot be fully mitigated through LID due to site constraints or existing infrastructure, **Green Stormwater Infrastructure (GSI)** is often used. GSI is a suite of "systems and practices that restore and maintain natural hydrologic processes in order to reduce the volume and water quality impacts of the built environment while providing multiple societal benefits." GSI relies heavily on infiltration, evapotranspiration, storage and reuse. These functions are utilized in a decentralized way throughout the landscape to manage stormwater as close to the source as possible.

Summary of Review & Findings: Town of Cabot, VT

This review provides a general analysis of the extent to which the Town of Cabot supports the use and implementation of LID and GSI. Cabot is a rural and agricultural community with a relatively high-density village center adjacent to a critical body of water, the Winooski River. Cabot contains a number of significant lakes and ponds that drain into both the Lake Champlain and Connecticut River watersheds. These characteristics, along with issues

LID Components:

- Conservation Development
- Minimize Soil Compaction
- Minimize Total Disturbance
- Protect Natural Flow Patterns
- Protect Riparian Buffers
- Protect Sensitive Areas
- Reduce Impervious Surfaces
- Stormwater Disconnection

Documents Reviewed and Referenced:

- Cabot Town Plan (2012)
- Draft Cabot Land Use Regulations (January 2014)

regarding storm water runoff resulting from the road network, sparse vegetative buffer strips along the Winooski River and water quality degradation concerns in many of Cabot's lakes and ponds provide ample reason to seek ways in which to capture, slow and infiltrate stormwater wherever possible.

Cabot's draft Land Use Regulations ("the Bylaws") incorporate various green infrastructure and low impact development practices through impervious cover maximums and minimum lot size in specific zoning district standards, general standards that protect natural resources and include specific erosion control and stormwater management standards, and various provisions to preserve natural features and systems in subdivision and PUD standards.

Notable are the specific requirements that LID stormwater management practices be implemented to the maximum extent practical and prohibition of conventional structural stormwater management practices outside the Village Center district; requirement of a stormwater management plan for projects that reach an impervious area threshold or are located on steep slopes; a conservation subdivision design process that defines disturbance areas and uses designation of building envelopes to limit clearing and protect natural resources; and inclusion of surface water standards to protect vegetated buffer strips (100 ft in rural districts and 20 ft in developed districts).

Steps the Town of Cabot could take to reduce barriers to green infrastructure implementation and further address protection for the Upper Winooski watershed include incorporation of:

- More detailed discussion in the Town Plan of opportunities for green stormwater infrastructure/ low-impact development best management practices;
- Explicit description of how riparian buffer is measured (from top of bank, etc. see VLCT Model Riparian Buffer ordinance) and requirements roadways or access drives to cross buffer at a right angle to the stream channel;
- Reduced driveway width minimums to better reflect LID standards; Allow parking stall lengths to be reduced to allow for vehicle overhang into a vegetated area;
- More specific requirements for disconnected impervious areas (i.e. the impervious surface area draining to any single vegetated area will not exceed 1,000 sq ft.)
- Incentives or requirements for permanent easements on riparian or wetland buffer areas;
- Though certain terms are defined within the ordinance, for ease in interpretation consider adding LID terms to definitions section also.

Municipal Review:

- **Part 1:** General Plan Sections and Language
Score: 9 out of 10
- **Part 2:** Vegetation and Landscaping
Score: 13 out of 16
- **Part 3:** Minimizing Land Disturbance
Score: 12 out of 12
- **Part 4:** Impervious Area Management
Score: 18 out of 26

Total Score:
52 out of 64

If you have any questions about this review or recommended ordinance language, please contact Kim McKee at mckee@cvregion.com.

Part 1. General Plan Sections and Language

Is there background discussion on (0-5 points):

Score: 4

- Yes No Low-Impact Development and/or Green Stormwater Infrastructure concepts
- Yes No Mention of physical setting, i.e. surface waters and watersheds in the town and region and what are the quality and threats to these resources
- Yes No Steep slopes
- Yes No Protecting shorelines and wetlands
- Yes No Urban ecosystems - rainwater travel through streets, trees, rooftops, gardens etc.

Comments:

There is no reference to the terms *LID* or *Green Stormwater Infrastructure* specifically; though concepts are touched on briefly in the Floodplains, Flood Hazards and Fluvial Erosion section of the Natural Heritage chapter and in the Transportation chapter. More specifically, the connection between road and parking lot design and storm water runoff issues is discussed as well as the need to incorporate landscaping to provide a buffer to absorb stormwater run-off.

There is apt discussion of the physical elements significant to the Town and Village. These include geology, steep slopes, soils and drainage, development capability, earth resources, climate change and weather patterns, wetlands, lakes and ponds, rivers and streams, floodplains and flood hazard areas, steep slopes, rivers and streams, groundwater, and different types of wildlife habitat. The plan includes lengthy discussion of potentially impacts of climate change, flood hazards, impacts of impervious surfaces on increasing runoff and erosion potential and various factors contributing to wildlife habitat degradation, including threats to water quality.

Natural Resources goals include to prevent changes to the landscape which could increase hazardous flooding and to improve water quality. Various implementation strategies are included to protect fragile features, open space and natural resources through the town's Bylaws as well as non-regulatory strategies such as landowner education and outreach, establishment of a conservation reserve fund and stream bank restoration projects.

Have inventories been done? (0-5 points)

Score: 5

- Yes No Basins, watersheds, surface water resources
- Yes No Roads, bridges and culverts
- Yes No Impaired and threatened waters
- Yes No Topography, including steep slopes
- Yes No Soils - infiltration rates

Comments:

The Plan inventories basins, watersheds and surface water resources and discusses ongoing efforts to assess and improve water quality. Threats to water quality are discussed and specific issues of concern are outlined in regards to lakes and ponds.

Prime agricultural soils of federal and statewide importance are described and mapped. Prime farmland/farmland of statewide importance are both discussed and mapped. Soil classifications and characteristics are referenced as mapped and made available by the Natural Resource Conservation Service. Bridges and culverts were inventoried and assessed by CVRPC in 2013 and roads are inventoried in the Transportation section of the Plan.

Areas of steep slopes are mapped and development constraints in relation to steep slopes are discussed throughout the Plan.

Part 2. Vegetation and Landscaping

A. Preservation of Natural Areas (0-5 points)

Score: 4

Municipal regulations should include requirements to preserve existing vegetated areas, minimize turf grass lawn areas, and use native vegetation.

- Yes No Are applicants required to provide a layout of the existing vegetated areas, and a description of the conditions in those areas?
- Yes No Does the municipality have maximum as well as minimum yard sizing ordinances?
- Yes No Are residents restricted from enlarging existing turf lawn areas?
- Yes No Do the ordinances provide incentives for the use of vegetation as filters for stormwater runoff?
- Yes No Do the ordinances require a specific percentage of permanently preserved open space as part of the evaluation of cluster development?

Comments:

The Bylaws outline several site design guidelines that include requirements to preserve existing vegetated areas. To minimize erosion, Development standards in Section 3.D.01 strongly encourages applicants to "protect existing site features that naturally aid in managing stormwater run-off and preventing erosion" and to "minimize clearing of natural vegetation and preserve natural areas consisting of wooding vegetation, preferably in contiguous blocks or corridors." Applicants are also required to establish a "disturbance area" that must "exclude existing vegetation that is required to be retained as a condition of approval unless specifically approved by the DRB."

These standards also prohibit clearing in 100 ft buffers from all rivers, streams or ponds (Section 3.D.03) and from Class I and Class II wetlands (Section 3.D.04). Soil disturbance is also limited on steep slopes (Section 3.D.05).

Subdivision plans required building envelopes (Section 3.F.02.E) for each lot which serves to limit clearing. Subdivisions in the Rural, Developed Shoreland, Shoreland and Conservation districts are required to follow conservation design principles that minimize clearing of existing vegetation (Section 3.F.04), particularly related to preserving contiguous forest blocks and minimizing tree canopy openings. While there is no reference to a specific maximum or minimum yard sizing ordinance, Subdivision Standards also require to the greatest extent feasible that clearing outside building envelopes be limited, even if not associated with forestry and farming (i.e. extensive lawns).

Planned Unit Development (PUD) standards require at least 60% of the development site must be conserved as undeveloped open space in perpetuity. Density bonuses are allowed if 80% or more of the PUD will be conserved (Section 3.G.02.E). PUDs also provide incentives in the form of density bonuses for use of green infrastructure systems and practices to reduce the impact of development on streams, rivers and water quality (Section 3.G.02.F).

B. Tree and Forest Protection Ordinances (0-3points) Score: 3

Municipalities should consider enhancing tree ordinances to a forest ordinance that would also maintain the benefits of forested areas (not just individual trees and their removal and replacement)

Yes **No** Does the municipality have a tree protection ordinance?

Yes **No** Can the municipality include a forest protection ordinance?

Yes **No** If forested areas are present at development sites, is there a required percentage of the stand to be preserved?

Comments:

While there is not a standalone Forest Protection ordinance, subdivision review in the Rural, Developed Shoreland, Shoreland, and Conservation districts must follow conservation design principles and includes a section on site design considerations specific to subdivision development on Forestland (Section 3.F.04.C) to the greatest extent feasible. These standards aim to facilitate continued or future management and harvesting of timber, and/or to conserve contiguous tracts of forest for ecological benefits. The DRB may in certain cases, where a landowner undertakes forest management activities as a part of pre-development site preparation, require the site or portions of the site to be restored or re-vegetated.

The Bylaws do not require an exact percentage of a stand to be preserved, but subdivision design standards serve to ensure Forestland will be protected to the greatest extent feasible. Development standards related to erosion control strongly encourage applications to preserve natural areas consisting of woody vegetation, preferably in contiguous blocks or corridors.

C. Landscaping Island and Screening Ordinances (0-3 points) Score: 3

Landscaping islands can provide ideal opportunities for the infiltration and disconnection of runoff, or the placement of GSI systems. Hardy, low maintenance vegetation should be used for successful, low-cost systems.

- Yes** **No** Do the ordinances require landscaping islands in parking lots, or between the roadway and the sidewalk?
- Yes** **No** Can the ordinance be adjusted to require vegetation that is more beneficial for stormwater quality, groundwater recharge, or stormwater quantity, but that does not interfere with driver vision at the intersections?
- Yes** **No** Is the use of bioretention islands and other stormwater practices within landscaped areas or setbacks allowed and/or encouraged?
- Yes** **No** Do the ordinances require screening from adjoining properties? Can the screening criteria require the use of vegetation to the maximum extent practical before the use of walls or berms?

Comments:

Standards for site design of parking areas in the Bylaws require landscaped islands in rows that contain over 10 contiguous parking spaces (Section 3.B.04.G). The DRB may also require street trees at the edge of any road right-of-way and will require street trees within Village zoning districts (Section 3.B.08.B).

The Bylaws specifically include site design guidelines to reduce and manage stormwater, including a requirement to implement Low Impact Development stormwater management practices to the maximum extent practical (Section 3.D.02.D). Section 3.D.02.E lists the suitable stormwater management practices to be considered. The Bylaws go as far to prohibit conventional structural stormwater management practices outside of the Village Center district unless specifically approved by the DRB.

Screening requirements encourage maintaining existing trees and require use of vegetation along roads, in front and side yards and in parking lots. Notable are requirements for street trees in the Village zoning districts.

D. Riparian Areas (0-5 points)

Score: 3

Municipalities may have existing buffer floodplain ordinances that require the protection of vegetation adjacent to streams. The municipality should consider conservation restrictions and allowable maintenance to ensure the preservation of these areas.

- Yes** **No** Are there measures beyond Floodplain Districts to provide streamside buffers in the community? If so, how strong is this buffer and does it apply in areas zoned for higher density residential and commercial development?
- Yes** **No** Has the municipality also adopted FEH overlay districts or equivalent on a significant portion of its streams in areas zoned for higher density residential and commercial development?
- Yes** **No** Do the ordinances require a conservation easement, or other permanent restrictions on buffer areas?
- Yes** **No** Do the ordinances identify or limit when stormwater outfall structures can cross the buffer?

Yes **No** Do the ordinances restrict development activities that increase impervious cover?

Comments:

Development standards to protect natural resources include provisions that restrict development within buffer areas of rivers, streams, ponds and wetlands. A 100 ft buffer must remain naturally vegetated on all rivers, streams, or ponds, excepting the Village and Developed Shoreland districts where the minimum buffer is 20 ft. The Town is currently in the process of developing regulations that restrict development within River Corridors/FEH areas.

The Bylaws do not require a conservation easement or permanent restrictions on riparian buffer areas specifically, but Subdivision and PUD standards do require permanent conservation easement for all natural areas, green spaces, open space, farm or forestland dedicated in the development process.

Impervious cover is restricted by the use of building envelopes in subdivision regulations impervious cover maximum (ICM) provisions in the various zoning districts – the Conservation District is most restrictive (5% ICM), followed by the Rural District (10%), Shoreland District (10%) and Developed Shoreland District (60%). The remaining higher density districts all maintain an impervious cover maximum to varying extents, requiring a certain amount of greenspace.

Amount of impervious area also factors in to erosion control standards in development review regarding whether a development is classified a major or minor project and whether or not a Stormwater Management Plan will be required. These criteria provide incentive to reduce impervious area in development proposals.

Part 3. Minimizing Land Disturbance

The minimization of disturbance can be used at different phases of a development projects. The goal is to limit clearing, grading, and other disturbance associated with development to protect existing features that provide stormwater benefits. Zoning ordinances typically limit the amount of impervious surfaces on building lots, but do not limit the amount of area that can be disturbed during construction. This strategy helps preserve the site's existing hydrologic character, as well as limiting the occurrence of soil compaction.

A. Limits of Disturbance (0-7 points)

Score: 7

Designing with the terrain, or site fingerprinting, requires an assessment of the characteristics of the site and the selection of areas for development that would minimize the impact. This can be incorporated into the requirements for existing site conditions and the environmental impact statement. Limits of disturbance should be incorporated into construction plans reviewed and approved by the municipality. Setbacks should be evaluated to determine whether they can be reduced.

Yes **No** As part of the depiction of existing conditions, are environmentally critical and environmentally constrained areas identified? (Environmentally critical areas are areas or features with significant environmental value, such as steep slopes, stream corridors, natural heritage priority sites, and habitats of threatened and endangered species.

Environmentally constrained areas are those with development restrictions, such as wetlands, floodplains, and sites of endangered species.)

- Yes No Can any of the existing setbacks be reduced?
- Yes No Are there maximum turf grass or impervious cover limits in any of the setbacks?
- Yes No Do the ordinances inhibit or prohibit the clear-cutting of the project site as part of the construction?
- Yes No Is the traffic of heavy construction vehicles limited to specific areas, such as areas of proposed roadway? Are these areas required to be identified on the plans and marked in the field?
- Yes No Do the ordinances require the identification of specific areas that provide significant hydrologic functions, such as existing surface storage areas, forested areas, riparian corridors, and areas with high groundwater recharge capabilities?
- Yes No Does the municipality require an as-built inspection before issuing a certificate of occupancy? If so, does the inspection include identification of compacted areas, if they exist within the site?
- Yes No Does the municipality require the restoration to compacted areas in accordance with the Soil Erosion and Sediment Control Standards?

Comments:

Subdivision and PUD Standards follow conservation design principles and list highest priority resources as unbuildable land, important farmland, important wildlife habitat and shorelands and riparian areas. These resources *will be* mapped for reference. Development standards in Section 3.D restrict development on steep slopes, within stream corridors and wetland buffers. Subdivision site design standards also restrict fragmentation of contiguous tracts of forest for ecological benefits. The Bylaws do not specifically reference natural heritage sites or rare, threatened and endangered species, though it is possible these will be included on the referenced map.

Disturbance Areas (Section 3.D.01.D) and Building Envelopes (Section 3.F.02.E) limit clear-cutting and various maximums are set in the specific zoning districts that limit the percentage of the lot that may be covered with impervious surfaces.

Construction vehicles are limited to operation within the designated disturbance area according to erosion control standards (Section 3.D.01.D). In addition, phasing of construction is strongly encouraged to minimize the area that is disturbed at any one time and length of time that any area is disturbed.

The Town may require a site inspection before the building is occupied or use commences in order to issue a Certificate of Substantial Completion. Though inspection as described does not specifically reference identification of compacted areas, compliance with conditions of the zoning permit per Section 3.D.01.E, Erosion Control Practices, could require re-seeding and mulching bare soil immediately once construction or a phase of construction is complete.

B. Open Space and Cluster Development (0-5 points)

Score: 5

Open space areas are restricted land that may be set aside for conservation, recreation, or agricultural use, and are often associated with cluster development requirements. Since open space can have a variety of uses, the municipality should evaluate its open space ordinances to determine whether amendments are necessary to provide improved stormwater benefits.

- Yes** **No** Are open space or cluster development designs allowed in the municipality?
- Yes** **No** Are flexible site design incentives available for developers that utilize open space or cluster design options?
- Yes** **No** Are there limitations on the allowable disturbance of existing vegetated areas in open space?
- Yes** **No** Are the requirements to re-establish vegetation in disturbed areas dedicated for open space?
- Yes** **No** Is there a maximum allowable impervious cover in open space areas?

Comments:

Cabot uses conservation subdivision design principles that list unbuildable land, important farmland, important wildlife habitat and shorelands and riparian areas as highest priority conservation resources with various design standards that facilitate this "to the greatest extent feasible." Flexible site design incentives are available for developers that utilize PUD in the form of density bonuses for increased open space set aside, provision of public access to open space, use of green infrastructure practices, incorporation of mixed uses or incorporation of affordable housing units.

Use of Building Envelopes (Section 3.F.02.E) limits disturbance of existing vegetated areas in open space. The DRB may in certain cases, where a landowner undertakes forest management activities as a part of pre-development site preparation, require the site or portions of the site to be restored or re-vegetated (Section 3.F.04.C). Subdivision standards require that building envelopes be located and configured to minimize the amount of impervious surface required to provide access to the building sites. Land dedicated as open space requires a conservation easement per PUD (Section 3.G.03.D) and Subdivision standards (Section 3.F.05.A).

Part 4. Impervious Area Management

The amount of impervious area, and its relationship to adjacent vegetated areas, can significantly change the amount of runoff that needs to be addressed by BMPs. Most of a site's impervious surfaces are typically located in the streets, sidewalks, driveway, and parking areas. These areas are further hampered by requirements for continuous curbing that prevent discharge from impervious surfaces into adjacent vegetated areas.

A. Streets and Driveways (0-8 points)

Score: 7

Street widths of 18 to 22 feet are recommended for low impact development designs in low density residential developments. Minimum driveway widths of 9 and 18 feet for one lane and two lanes, respectively, are also recommended. The minimum widths of all streets and driveways should be evaluated to demonstrate that the proposed width is the narrowest possible consistent with safety and

traffic concerns and requirements. Municipalities should evaluate which traffic calming features, such as circles, rotaries, medians, and islands, can be vegetated or landscaped. Cul-de-sacs can also be evaluated to reduce the radius area, or to provide a landscape island in the center.

- Yes** **No** Are the street widths the minimum necessary for traffic density, emergency vehicle movement, and roadside parking?
- Yes** **No** Are street features, such as circles, rotaries, or landscaped islands allowed to or required to receive runoff?
- Yes** **No** Are curb cuts or flush curbs with curb stops an allowable alternative to raised curbs?
- Yes** **No** Can the minimum cul-de-sac radius be reduced or is a landscaped island required in the center of the cul-de-sac?
- Yes** **No** Are alternative turn-arounds such as "hammerheads" allowed on short streets in low density residential developments?
- Yes** **No** Can the minimum driveway width be reduced?
- Yes** **No** Are shared driveways permitted in residential developments?
- Yes** **No** Can you reduce total length by considering alternative street layouts?

Comments:

Cabot's Bylaws includes standards for driveways (Section 3.B.02) and private roads (Section 3.B.03) within Development Standards. Specifications for driveway (between 10-20ft) widths are slightly wider than Low-Impact Development recommended minimums, though specifications for private roads (14ft if <80 ADT or 20 ft if >160 ADT) allow for reduced widths than the LID recommended minimums.

Landscaped islands are not specifically discussed within the Bylaws though required landscaping along roads is discussed in Section 3.B.08.B. The DRB may require street trees at the edge of any road right-of-way, and will require street trees within the various Village zoning districts. Specifications for these street trees are included in the Bylaws.

Raised curbs are limited to the extent that roads must not be designed with curbs outside of the various Village zoning districts and Commercial Industrial district (3.B.03.B). Also, conventional structural stormwater management practices may not be used outside the Village Center district unless approved by DRB (Section 3.D.02.D). The Bylaws allow alternative turn-arounds (Section 3.B.03.B) and alternative street layouts per Subdivision Standards (Section 3.F.03.B) that requires long, uninterrupted streets be avoided to the extent feasible.

B. Parking Areas and Sidewalks (0-13 points)

Score: 8

A mix of uses at a development site can allow for shared parking areas, reducing the total parking area. Municipalities require minimum parking areas, but seldom limit the total number of parking spaces.

- Yes** **No** Can the parking ratios be reduced?
- Yes** **No** Are the parking requirements set as maximum or median rather than minimum requirements?
- Yes** **No** Is the use of shared parking arrangements allowed to reduce the parking area?

- Yes No Are model shared parking agreements provided?
- Yes No Does the presence of mass transit allow for reduced parking ratios?
- Yes No Is a minimum stall width of 9 feet allowed?
- Yes No Is a minimum stall length of 18 feet allowed?
- Yes No Can the stall lengths be reduced to allow vehicle overhang into a vegetated area?
- Yes No Do ordinances allow for permeable material to be used in overflow parking areas?
- Yes No Do ordinances allow for multi-level parking?
- Yes No Are there incentives to provide parking that reduces impervious cover, rather than providing only surface parking lots?

Sidewalks can be made of pervious material or disconnected from the drainage system to allow runoff to re-infiltrate into the adjacent pervious areas.

- Yes No Do ordinances allow for sidewalks constructed with pervious material?
- Yes No Can alternate pedestrian networks be substituted for sidewalks (e.g., trails through common areas)?

Comments:

Parking requirements are set as minimums though, according to Development Standards, shared parking arrangements are allowed in mixed-use developments and on-street parking can count towards required parking (Section 3.B.04). The DRB may also reduce or eliminate off-street parking requirements within the Village Center district. PUD standards provide a density bonus for PUDs that provide public parking in the Village Center, Lower Village or Village Neighborhood districts (Section 3.G.02.H).

No model shared parking agreements are provided and there is no mention of reduced parking ratios due to the presence of mass transit as mass transit options are lacking in outlying rural communities. Minimum stall width and length are in line with recommended LID minimums.

Seasonal, temporary or overflow parking lots are strongly encouraged to use permeable paving or other suitable surfaces that allow for infiltration of run-off (3.B.04.F). Though there is no reference to reducing stall lengths to allow vehicle overhang into a vegetated area, applicants are strongly encouraged to use vegetation within and around parking lots as part of a low-impact development approach to managing stormwater (Section 3.B.08.D).

The Bylaws do not specifically allow or prohibit multi-level parking structures, nor is there specific reference to sidewalks construction and materials used. Adequate pedestrian access is a criteria for site plan review, subdivision review, and PUD review though use of alternate pedestrian networks is not specifically referenced.

C. Unconnected Impervious Areas (0-3 points)

Score: 2

Disconnection of impervious areas can occur in both low density development and high density commercial development, provided sufficient vegetated area is available to accept dispersed stormwater flows. Areas for disconnection include parking lot or cul-de-sac islands, lawn areas, and other vegetated areas.

- Yes No Are developers required to disconnect impervious surfaces to promote pollutant removal and groundwater recharge?
- Yes No Do ordinances allow the reduction of the runoff volume when runoff from impervious areas is infiltrated into vegetated areas?
- Yes No Do ordinances allow flush curb and/or curb cuts to allow for runoff to discharge into adjacent vegetated areas as sheet flow?

Comments:

While there is no specific requirement referenced to disconnect impervious surfaces, this objective can still be achieved via Low Impact Development (LID) techniques encouraged or required in different sections of the Bylaws. Site Plan Review, Subdivision Review and PUD Review requires use of LID techniques that would serve to infiltrate stormwater adjacent to and within impervious areas (to the extent that is physically and economically feasible). "Major projects" on steep slopes and/or reaching a certain threshold of impervious area would require a Stormwater Management Plan that would take disconnection of impervious surfaces into account. Rooftop disconnection is also one of the recommended best management practices in the *Vermont Low Impact Development Guide for Residential and Small Sites* referenced in the Bylaws.

Landscaping standards also strongly encourages applicants to use vegetation within and around parking lots as part of a LID approach to managing stormwater (Section 3.B.08.D). The Bylaws prohibit the use of curbs outside the Village zoning districts.

D. Vegetated Open Channels (0-2 points)

Score: 1

The use of vegetated channels, rather than the standard concrete curb and gutter configuration, can decrease flow velocity, and allow for stormwater filtration and re-infiltration. One design option is for vegetated channels that convey smaller storm events, such as the water quality design storm, and provide an overflow into a storm sewer system for larger storm events.

- Yes No Do ordinances allow or require vegetated open channel conveyance instead of the standard curb and gutter designs?
- Yes No Are there established design criteria for vegetated channels?

Comments:

Shallow vegetated swales and infiltration trenches to store, treat and convey runoff are listed as a recommended stormwater management practice. The Bylaws do not specifically reference design criteria, but do reference the state's *Low Impact Development Guide for Residential and Small Sites* which contains design considerations.

SUMMARY OF QUANTITATIVE ANALYSIS

GI / LID Municipal Plan and Bylaw Review:	
Name of Municipality	Town of Cabot, VT
County	Washington
Month and Year of Review	Feb. 2014
Name of RPC performing review	Central Vermont RPC
Part 1. General Plan Sections and Language	
Is there background discussion (0-5 points)	4
Have inventories been done (0-5 points)	5
Part 2: Vegetation and Landscaping	
A. Preservation of Natural Areas (0-5 points)	4
B. Tree and Forest Protection Ordinances (0-3 points)	3
C. Landscaping Island and Screening Ordinances (0-3 points)	3
D. Riparian Areas (0-5 points)	3
Part 3: Minimizing Land Disturbance	
A. Limits of Disturbance (0-7 points)	7
B. Open Space and Cluster Development (0-5 points)	5
Part 4: Impervious Area Management	
A. Streets and Driveways (0-8 points)	7
B. Parking Areas and Sidewalks (0-13 points)	8
C. Unconnected Impervious Areas (0-3 points)	2
D. Vegetated Open Channels (0-2 points)	1
TOTAL SCORE	52
MAXIMUM SCORE	64