

# Low Impact Development (LID) Report City of Bothell 2011

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## Introduction

The purpose of this document is to help identify barriers for LID implementation, and establish goals and metrics to promote and measure the use of LID techniques.

## Identified Structural Barriers and Measures to Address Them

The current economic situation has resulted in fewer permit applications which inhibits our ability to completely identify barriers for implementation. The following identified barriers are an estimation based on a thorough investigation of our codes and practices with limited input from permit applications:

### *Operations and Maintenance*

**Inspection Barrier-** Any commercial construction of LID techniques currently requires a special inspection. This is an additional burden on a project being developed. Also, we currently employ a water quality inspector for our annual inspection program, but they are not trained to adequately inspect LID techniques. There is also concern that replacing a single large pond with multiple smaller LID techniques will significantly increase the time required to inspect and attain compliance with maintenance standards.

*Action-* Hire an inspector that is knowledgeable with installation and maintenance of LID techniques to cover both the construction and annual inspections, while cross training with current inspectors to improve the level of knowledge and awareness of all staff.

**Maintenance Barrier-** some LID techniques require more in depth gardening maintenance and expertise that is not currently housed within our Street and Storm Maintenance crew. As both Parks and Maintenance are funded through our general fund there is contention as to who is responsible for this type of maintenance.

*Action-* Establish a maintenance policy and schedule and provide training and possible funding to support the division tasked with this responsibility

### *Staff Training and Experience*

**Reluctance to Adopt Barrier-** There is some skepticism as to whether LID is an acceptable alternative to conventional means. While training has been offered there seems to be an

additional hesitancy due to lack of confidence in the effectiveness of these techniques. Also, current work load inhibits travel and ability to obtain further training

*Action-* This barrier will be solved (or confirmed) through implementation over time. Some engineers are not convinced that these methods will provide an adequate solution without compounding current stormwater issues. The City will attempt to bring LID training to Bothell to further encourage understanding and participation

**Process Needs Adjustment to Regulate-** Current staff are working on a myriad of tasks and need to have a streamlined application and permitting process to minimize the additional time constraints

*Action-* streamline the process so that planners and review staff have the proper permitting process and do not have to apply several extra steps to accomplish these tasks

### *Community Acceptance and Understanding*

**Lack of understanding of techniques-** could possibly lead to improper assessment of site conditions and allowance for noncompliance without a complete assessment of all available LID possibilities

*Action-* Update current review checklist with all LID techniques available in our Design Manual and provide a list of possible techniques for each soil type and individual site conditions

**Lack of qualified planning-** can lead to potential improper design and initial placement of LID structures

*Action-* Seek updated and clear guidance documents and training opportunities that provide clear instruction for planning and review staff so that all consultant plans are properly assessed to address potential installation failures

**Lack of qualified contractors-** can lead to improper placement and installation on site

*Action-* Hire an LID inspector or train construction inspectors to ensure that proper installation occurs according to each specific LID technique

### *Economic Issues*

**Lack of permit project applications-** impedes our ability to identify barriers

*Action*-Economy will hopefully turn around in the near future to allow for new permit applications

**Lack of development interest**- impedes adoption of new regulations

*Action*- Provide education and training to staff that utilizing the proper techniques will allow for urban development

**Poor economic conditions**- increases the cost complaints from potential developers

*Action*-Create innovative ways to incentivize LID techniques and/or eliminate the option of using cost as an excuse not to implement LID otherwise this will continue to be an issue for noncompliance

## *Environmental Concerns*

**Soil types**- in some areas of Bothell prohibit the use of LID infiltration techniques

*Action*- determine whether amended soils will provide adequate infiltration for a 25-50 year storm event and allow for conventional method overflow installation to accommodate for 100 year storm event (though overflow eliminates the design advantage of using an LID technique)

**Groundwater levels**- in some areas of Bothell prohibit the use of LID infiltration techniques

*Action*- create a list of alternative methods which can be applied when groundwater levels prohibit infiltration techniques

**Floodplain management**- in some areas of Bothell prohibit the use of LID infiltration techniques

*Action*- create a list of alternative methods that are based on site constraints

**Presence of existing infrastructure**- on some development sites prohibits the use of LID techniques on site

*Action*- create a list of LID techniques that will function within the site constraints

**Presence of contaminated soils**- prohibits the use of some LID infiltration techniques on site

*Action*-provide a list of LID techniques that do not require infiltration into the existing soils, or require all redevelopment to amend all known contaminated soils

**Prolific Springs or Seeps**- areas within Bothell that have prolific springs or seeps within the development site prohibit the use of LID infiltration techniques

*Action-* provide a list of LID techniques that do not require infiltration on site

## **Identified Nonstructural Barriers and Measures to Address Them**

*Nonstructural Regulatory* (submitted by our Community Development Planners)

The *Imagine Bothell...Comprehensive Plan* as implemented within the Bothell Municipal Code contains barriers to implementation of a number of Low Impact Development principles. The City of Bothell utilizes a net buildable area approach to determining potential lot or dwelling unit yield. This net development approach deducts a number of site elements including surface water facilities from potential lot yield. Accordingly, the more land area occupied with surface water facilities the fewer lots or units a developer will achieve.

The City of Bothell relies upon a minimum lot area approach to control single family residential density. This method prohibits minimizing lot area to 'cluster' developments into smaller footprints resulting in a greater amount of land disturbed to accommodate a given development. Accordingly, many LID principles, such as clustering, preservation of forested areas and inclusion of surface water facilities adjacent to or as part of a lot, are prohibited.

Conceivably, it is possible for a development to implement all of the LID principles identified by Ecology and still comply with the City of Bothell's lot area and deduction of surface water facility provisions. But such compliance would come at a cost to both the developer in economic terms and City of Bothell in drastically reduced GMA population capacities.

Amendments to the Comprehensive Plan and implementing BMC are needed to fully accommodate the LID principles identified by the Department of Ecology.

### **Discussion**

The Washington State Department of Ecology (Ecology) is responsible for issuing National Pollution Discharge Elimination System (NPDES) Phase II Permits to jurisdictions in the State of Washington. These Phase II permits must be obtained by all local governments desiring to administer and issue grading permits and other land disturbance activities. Without a Phase II Permit a local government that issues a grading permit could be in violation with the Federal Clean Water Act subject to the punishments and enforcement actions of that federal law.

For an undeveloped property, rainfall and other precipitation falls onto trees, understory plants, groundcovers, and organic matter and rarely falls directly onto exposed soils. This natural cycle creates a hydrologic regime 50% evapo-transpiration, 35% absorbed into the groundwater table, and 15% leaving the site as surface water runoff. However, development removes those natural features and replaces them with roofs, parking lots, sidewalks and other surfaces that do not allow infiltration into the soil and reduces evapo-transpiration. These 'traditional' construction techniques and development patterns result in a hydrologic cycle of 15% Evapo-transpiration, 15% Infiltration and 70% surface water runoff. This change to the natural cycle results in greater

surface water runoff flows and volumes because precipitation is intercepted by the impervious surfaces then quickly transported to pipes, concreted-lined vaults, and other facilities where it is stored and released to surface water bodies. These practices prevent water infiltration to the soil reducing groundwater infiltration and increasing the speed, volume and flow of surface water runoff into streams and rivers. Such changes degrade the natural morphology of creeks, streams and rivers resulting in poor habitat conditions for aquatic wildlife. Preventing such damage requires developments maintain a more natural hydrologic cycle.

Low Impact Development is the term used to describe a host of development and surface water practices which more closely match the natural hydrologic cycle

The Washington State Department of Ecology has issued guidance to local governments which describe a number of LID development principles which include:

- Clustering development;
- Limiting the amount of impervious surface cover;
- Narrowing roads, streets and other public thoroughways;
- Retaining native vegetation; and,
- Reducing lot setbacks.

Each of the principles identified by Ecology touch a number of possible regulatory barriers within different locations within the Comprehensive Plan and BMC. The following section identifies potential barriers within the Imagine Bothell...Comprehensive Plan and the Bothell Municipal Code.

### **Potential Barriers to implementation of Low Impact Development Surface water/ infiltration facilities.**

The analysis below is limited to those landscape elements of Low Impact Development that would result in a departure from 'traditional' development. These landscape elements or features include such things as clustering of development, retention of forest areas, installation of rain gardens, stormwater infiltration ponds, and other LID features which may occupy land traditionally devoted to other features such as yards, streets, and parking lots.

#### **Surface water barriers**

*Imagine Bothell...* Comprehensive Plan  
Land Use Element Policies

LU-P4 The City shall maintain a Comprehensive Plan Map (see Figure LU-4 in map pocket) for the purpose of illustrating the proposed allocation of land uses throughout the Bothell Planning Area. Land uses shall be categorized by the following designations. It is intended that these designations be utilized separately where only one type of land use is determined to be appropriate, and in combination where more than one type of land use is determined to be appropriate. The development potential of any individual property under the land use designations of



this Comprehensive Plan shall be based on the net buildable area of that property, and shall be further subject to planned unit development provisions, availability of necessary utilities, critical area regulations, impact mitigation, and other applicable development policies, regulations and standards. Net buildable area, for the purposes of this Comprehensive Plan, shall mean the gross land area, measured in acres, minus land area in roads and other rights of way, surface stormwater retention / detention / water quality facilities, critical areas, critical area buffers, and land dedicated to the City. (emphasis added)

This Comprehensive Plan Policy is implemented in the development regulations within BMC 12.14.030.B.2.d which states:

“Land area in roads and other rights-of-way, surface storm water retention/detention/water quality facilities, critical areas, critical area buffers, or land dedicated to the city, shall not be included in any proposed single-family lot, unless so stated in the conditions of an approved planned unit development, in accordance with Chapter 12.30 BMC.”

12.14.030. B.3.d states:

“In the R 5,400a through R 2,800 zones, land area in roads and other rights-of-way, surface storm water retention/detention/water quality facilities, critical areas, critical area buffers, or land dedicated to the city shall not be counted in the calculation of number of units allowed, unless so stated in the conditions of an approved planned unit development, in accordance with Chapter 12.30 BMC.”

#### **Analysis – LID surface water facility barriers**

Land Use Element Policy 4 and BMC 12,.14.030.B.2.d and 12,.14.303.B.3.d establishes the potential of a property as being based upon the net buildable area, which is established after deducting a number of features from the gross site area. These deductions have a direct effect upon the number of lots or dwelling units achievable on a given property. For example, should LID-consistent surface water facilities (ponds, rain gardens, infiltration areas) require additional land area when compared to more conventional surface water facilities (underground vaults, pipes, catch basins) the resultant lot or dwelling unit yield would be reduced. This is a disincentive to incorporating LID surface water facilities, which tend to be dispersed throughout the development and can occupy larger areas of land which would result in fewer lots / dwelling units within the development.

#### **Barriers to Clustering and Tree retention**

*Imagine Bothell...* Comprehensive Plan  
Land Use Element Policies

LU-P4 The City shall maintain a Comprehensive Plan Map (see Figure LU-4 in map pocket) for the purpose of illustrating the proposed allocation of land uses throughout the Bothell Planning Area. Land uses shall be categorized by the following designations. It is intended that these designations be utilized

separately where only one type of land use is determined to be appropriate, and in combination where more than one type of land use is determined to be appropriate. The development potential of any individual property under the land use designations of this Comprehensive Plan shall be based on the net buildable area of that property, and shall be further subject to planned unit development provisions, availability of necessary utilities, critical area regulations, impact mitigation, and other applicable development policies, regulations and standards. Net buildable area, for the purposes of this Comprehensive Plan, shall mean the gross land area, measured in acres, minus land area in roads and other rights of way, surface stormwater retention / detention / water quality facilities, critical areas, critical area buffers, and land dedicated to the City. (emphasis added)

Comprehensive Plan Map designations shall be implemented through zoning classifications on the City's official Zoning Map.

**1. Residential, 40,000 square foot minimum lot size (R 40,000).**

This designation shall provide for detached residential development at a minimum lot size of 40,000 square feet, plus compatible uses such as schools and churches.

The R 40,000 Plan designation shall be implemented by the R 40,000 zoning classification.

- 2. Residential, 9,600 square foot minimum lot size (R 9,600);  
Residential, 8,400 square foot minimum lot size (R 8,400);  
Residential, 7,200 square foot minimum lot size (R 7,200);  
Residential, 5,400 square foot minimum lot size, detached (R 5,400d).**

These designations shall provide for detached residential development at minimum lot sizes of 9,600, 8,400, 7,200 and 5,400 square feet, and compatible uses such as schools and churches.

These Plan designations shall be implemented by identically named zoning classifications. That is, the R 9,600 Plan designation shall be implemented by the R 9,600 zoning classification; the R 8,400 Plan designation shall be implemented by the R 8,400 zoning classification; and so forth.

- 3. Residential, one dwelling unit per 5,400 square feet of net buildable area, attached or detached (R 5,400a);  
Residential, one dwelling unit per 4,000 square feet of net buildable area (R 4,000);  
Residential, one dwelling unit per 2,800 square feet of net buildable area (R 2,800).**

These designations shall provide for attached or detached residential development at one dwelling unit per 5,400, 4,000 and 2,800 square feet of net buildable area, and compatible uses such as schools, churches and day care centers.

These Plan designations shall be implemented by identically named zoning classifications. That is, the R 5,400a Plan designation shall be implemented by the R

5,400a zoning classification; the R 4,000 Plan designation shall be implemented by the R 4,000 zoning classification; and the R 2,800 Plan designation shall be implemented by the R 2,800 zoning classification.

This Comprehensive Plan Policy is implemented in the development regulations within BMC 12.14.030.B.2.a which states:

“Single-Family Minimum, Average and Maximum Lot Area.

- a. In the R 40,000, R 8,400, R 7,200 and R 5,400d zones, no lot shall be less than the minimum lot area per single-family dwelling unit, except as may otherwise be permitted under an approved planned unit development, in accordance with Chapter [12.30](#) BMC or under Fitzgerald/35th Avenue SE Subarea regulations in accordance with Chapter [12.52](#) BMC. No more than one primary dwelling unit shall be placed on a lot.”

12.14.030. B.3.a states:

“In the R 5,400a through R 2,800 zones, land area in roads and other rights-of-way, surface storm water retention/detention/water quality facilities, critical areas, critical area buffers, or land dedicated to the city shall not be counted in the calculation of number of units allowed, unless so stated in the conditions of an approved planned unit development, in accordance with Chapter [12.30](#) BMC.”

#### **Analysis – Barriers to Clustering and Tree retention**

Land Use Element Policy 4 and BMC 12, .14.030.B.2.a and 12, .14.303.B.3.a establish the development potential of a property based upon the net buildable area, which are those lands remaining after roads, surface water facilities, critical areas and their buffers, and land dedicated to the City are deducted from the gross site area. Accordingly, the greater the land area preserved as ‘lot area’ the greater the lot yield a developer may achieve.

Further, because the BMC requires that “...no lot shall be less than the minimum lot area...” land dedicated for other purposes, such as forested tracts, open space, parks, large surface water facilities, and other features identified with LID cannot be credited as part of the lot within single family residential zones. This represents a barrier to the LID principles of clustering and tree retention within single family residential zones.

#### **Action**

Development is economically driven and must ‘pencil-out’ or make a return on investment. Most of the barriers identified above are as much economic barriers as they are regulatory barriers. Conceivably, it would be possible for a development to implement all of the LID principles identified by Ecology and still comply with the City of Bothell’s lot area and deduction of surface water facility provisions s but such compliance would come at a cost to the developer of drastically reduced lot or dwelling unit yield. Another cost would be to the City of Bothell in drastically reduced population capacities and the resultant Growth Management Act (GMA) compliance issues.

Amendments to the Comprehensive Plan and implementing BMC are needed to fully accommodate the LID principles identified by the Department of Ecology.

## LID Feasibility Matrix

LID Techniques	Feasible/Not Feasible/ Limited	Structural/ NonStructural	Barriers/Limitations
Site analysis	F	NS	No barriers-need to modify application submittal requirements to require additional LID soil analysis and infiltration rates information
Native vegetative retention	F	NS	Barriers for non- green PUDs because tracts not credited toward lot size or density except for green PUDs. Need to modify Comp Plan and BMC to remove lot reduction requirement
Narrow road width	L	S	Need to maintain travel path for fire safety vehicles-limited to residential roads
Narrow sidewalks	NF	S	Conflicts with pedestrian access needs, urban streetscape standards, and ADA access requirements
Reduced setbacks	L	NS	Must maintain side yard setback between structures for fire safety. Some community opposition to 'close feeling' of minimal setback distances. Must modify Comp Plan and BMC to allow reduced yard setbacks absent a PUD
Clustering	F	NS	Must modify Comp Plan and BMC to allow reduced lot areas and dimensions to allow for clustering
Curbless roads to bio-infiltration	L	S	Sidewalks must be seperated from road with bio-infiltration or landscaping to address safety issue. Must have clearly defined edge

Curb inlets to bioinfiltration	F	S	Curbs required adjacent to sidewalks to prevent illegal parking
Bioretention/Rain gardens	F	S	Access, inspection and maintenance are an issue that must be addressed
Preserve organic soil layer	F	NS	Need to modify requirements to preserve organic layer and replace after construction
Minimize compaction of soils	F	NS	Must explore code options to incentivize or require compliance
Soil amendments	F	NS	No barriers
Pervious paving	L	S	Fire Department is reluctant to allow pervious paving on primary travel lanes
Green roofs	F	S	Modify building standards to require engineered designs, certification of membrane and possible venting requirements
Minimize excavation foundations	F	S	Engineered structural designs required
Tree wells/boxes	F	S	No barriers
Impervious surface limits	F	NS	Must modify BMC to limit the amount of impervious surfaces
Habitat corridors	L	NS	Technically feasible, but there is great barrier to lot area and density and would be very difficult to enforce
Conservation easements	L	NS	Again, technically feasible but difficult to enforce

Table A- LID Feasibility Matrix

# Practices, Goals, Planned Actions and Timeline

## *Current Practices*

### **Fitzgerald/35<sup>th</sup> Ave SE Subarea Regulations**

In 2008 City Council adopted heightened zoning and best practices regulations for a subarea within the City known as Fitzgerald/35<sup>th</sup> Ave SE (BMC 12.52). These regulations were put into place to protect the ground and surface water within the Palm, Woods, and Cole Creek drainage basins which provide necessary cool water sources for North Creek. Some LID and hydrologic saving measures put into place are as follows:

- 50 foot wide vegetated buffer must be placed adjacent to detached residential areas
- Use of reclaimed water for surface percolation or direct recharge-must meet groundwater recharge criteria in accordance with the State Department of Ecology
- Applicant must show that the proposed activity will not adversely affect the infiltration and recharging of the groundwater table in a manner that will result in decreases in groundwater interflow to surface water
- Effective impervious area shall not exceed 20% for lands zoned R 5,400a and R 9,600 and 15 percent for lands zoned R 40,000 based upon the gross area of the total site. Measures to achieve this standard shall include but are not limited to the following:
  - Minimization of impervious area from roadways and other sources through site layout
  - Employment of pervious surfaces on sidewalks, trails, and nontraveled portions of roads
  - Dispersion of surface water within preserved forests area through gravity systems
  - Infiltration of runoff through bioretention facilities adjacent to impervious surfaces consisting of swales with amended soils or similar facilities
  - Infiltration of runoff from roof areas to lawn areas with soil amendment or bioretention facilities
  - Employment of vegetated roofs
  - Engineered infiltration systems other than bioretention
- A management plan shall accompany all proposals for facilities to meet the effective impervious surfaces standards and shall include all periodic maintenance required for function
- Forest cover on site shall not be less than 50 percent for lands zoned R 4,500a and 60 percent for lands zoned R 9,600 or R 40,000. Forest cover shall be based upon the gross area of the total site.
- Site design shall follow a procedure to identify the natural processes existing on and around the development in a manner that preserves natural processes to the maximum amount extent feasible
- Site design shall locate all land alteration on the least sensitive portions of the site, and cluster developed areas
- Vehicle and pedestrian circulation systems shall be designed to minimize alteration of topography and natural hydrologic features

- LID Best Management Practices listed that may be used in defining credits for determining effective impervious surfaces:
  - Porous asphalt and pavement
  - Permeable pavers
  - Dispersion
  - Vegetated roofs
  - Reverse slope sidewalks
  - Bioretention
- Critical areas to include wildlife corridors that provide a continuous connection to North Creek along Cole Creek
- Application must include a special study to evaluate project impacts on critical fish and wildlife habitat existing on and in the vicinity.

### **GREEN Planned Unit Developments (PUD)**

The Green PUD code additions (BMC 12.30) allow developers the option of using LID techniques on site in addition to other non-structural LID options such as:

- Narrower roads
- Possible clustering
- Tree retention
- Critical area buffers

### **Stream Buffer**

Critical Area Regulations (14.04)-established regulations applicable City-wide for the protection of surface water bodies such as wetlands and streams

### **Protection of Groundwater Movement**

Hillside Development (12.14) - regulations applicable city-wide for the protection of groundwater movement as it may be affected by hillside development

LID techniques are required for development in our Design Manual with the caveat that they are subject to specific site conditions and a provision to omit them is allowed with proper documentation

### *Future Practices*

It is hoped that we will be able to make revisions to our code which remove all barriers, streamline the application process, and, where applicable, provide incentives for developers to adopt LID techniques

whenever possible on site. These non-structural barriers should be addressed to provide the option for sustainable development practices:

### **Clustering**

By addressing LU-P4 we hope to allow for clustering to occur in order to save some of the native landscape and allow for natural water flow whenever possible

### **Impervious Surface Limits**

For new development we hope to set an impervious surface limit to encourage maximum utilization of LID technique on site, and to reduce stormwater complications in the future

### **Narrower Roads**

Where possible we hope to establish a possible reduction in impervious road size. This would be supplemented with additional pervious sections along the side to accommodate the needs of street residents and emergency vehicles

### **Native Vegetation Retention**

The City currently has a policy to replace every lost tree on site with eight planted trees. This has proven to be ineffective at retaining forest cover and the trees are not required to stay when the property changes ownership. We are currently trying to define a way to allow trees outside of critical areas and buffers to be considered in the lot size to allow developers to retain as many native trees as possible for some type of credit towards their LID requirements.

### **LID Stormwater Facilities**

The City needs to remove the stormwater facilities from separate tracts when planning for lot size. This would allow developers to retain their number of lots while applying LID techniques such as rain gardens. This revision should take place during the initial code amendment process as this barrier seems to be a high priority for LID infiltration success.

### **Reduced Lot Setbacks**

The City Comprehensive Plan has certain standards to retain for parking and yard space which currently prohibit reduced lot setbacks. Amending current planning codes to allow for a reduction in certain areas would allow developers to adopt this non-structural LID. The Fire Department is holding to setbacks in between houses to allow access to first responders during emergency situations

### **Habitat Corridors**

Habitat corridors are not currently listed in our code and will need to be analyzed. Thought is to include this in our critical areas code to extend the buffers in order to provide an adequate habitat corridor for safe passage.



## **Conservation Easements**

Conservation easements are extremely problematic and our staff are very reluctant to adopt this type of non-structural LID option for our residents.

## **Goals**

**Goal 1-** To provide a checklist in 2011 for our planning and development review engineers which includes all possible LID techniques for use with separate options to deal with specific site conditions

Task 1a- obtain current review checklist

Task 1b- provide checklist revisions which include all possible LID structural and nonstructural credits for consideration

*Measurement of success-* use of the additions to checklist by review staff

**Goal 2-** To provide proper training for our planning and review staff which covers planning and design of LID techniques and includes constraints to ensure proper functionality

Task 2a- find training courses which provide a high level of this type of training

Task 2b- ensure that all staff reviewing and approving of LID are adequately trained

*Measurement of success-* training and certifications obtained by review staff

**Goal 3-**To obtain funding for and hire interns in order to provide adequate inspection of all regional and commercial stormwater systems

Task 3a- obtain funding for interns through internal processes or inclusion in current rate study

Task 3b- create a scope of work with minimum requirements for qualifications for HR and ask to post temporary intern positions for hire during the summer months

Task 3c- hire intern positions

*Measurement of success-* hiring of interns to fulfill requirements

**Goal 4-** To train our water quality inspector and interns in proper LID maintenance inspection techniques

Task 4a- find appropriate training certification courses to provide our inspector with sufficient knowledge of LID maintenance inspection procedures

Task 4b- ensure that all water quality inspectors are adequately trained in LID maintenance inspection procedures

Task 4c- create or obtain a brief training document to use for instruction of intern positions

*Measurement of success-* training of water quality inspector and support staff

**Goal 5-** To train our construction inspectors on proper installation of LID techniques

Task 5a- find appropriate training for construction inspectors which covers proper installation techniques

Task 5b- ensure that all construction inspectors are adequately trained in LID installation techniques

*Measurement of success-* training of construction inspectors

**Goal 6-** To determine where maintenance of regional LID facilities lies within the City and provide adequate support and training to ensure proper maintenance

Task 5a- meet with Parks, Maintenance and Operations, Street and Storm, and the Director to determine which PW Division will handle the maintenance of regional LID facilities

Task 5b- provide adequate training to said Division staff to ensure proper maintenance of regional LID facilities

Task 5c- determine whether said Division needs to add another seasonal, part-time, or full-time staff member to properly maintain these facilities

*Measurement of success-* Determination of maintenance obligation and training for said Division

**Goal 7-** To remove nonstructural barriers within Bothell City code to allow for more options to be considered

Task 7a- to provide an accurate assessment for Council which describes each known nonstructural barrier within our Code and the benefits to addressing these issues

Task 7b- to ask Council for approval to create code amendments to remove such barriers

Task 7c- hire a consultant to create the necessary code amendments for approval by Council

Task 7d- meet with Council and ask for the adoption of said amendments

*Measurement of success-* removal of nonstructural barriers in our City code

**Goal 8-** To revise the current stormwater comprehensive plan to include LID

Task 8a- to include this into the next comp plan revision for review

Task 8b- provide the new comp plan to Council for approval

*Measurement of success-* revision of current comprehensive plan

## Preferred Timeline for Bothell LID Sequencing

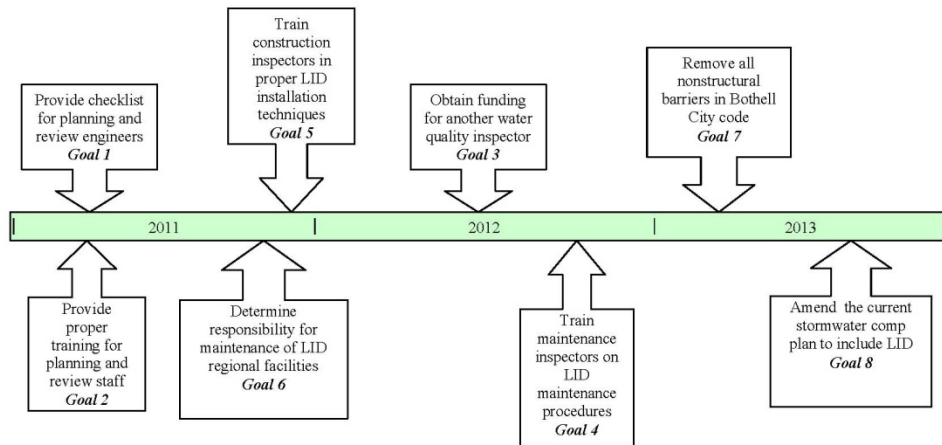


Table B- Sequencing for LID Adoption

## Conclusion

The barriers listed within this report represent all known obstacles; both structural and non-structural, to allow for complete LID implementation within the City of Bothell. This report is meant to be all inclusive; therefore it is not practical to assume that all impediments can be successfully removed within the current permit timeframe. It is important to note that impediments will also increase or decrease according to the economic status at the federal, state, and local level. Realistic goals and tasks have been determined along with a timeline for possible implementation which are also subject to economic constraints and political barriers. With proper funding, state requirements, and local encouragement, these goals can be completed within the specified amount of time.