LID Implementation – How???

- Planning Process Opportunities
  Getting jurisdiction buy-in and infusing LID into the fabric of your planning process

- Incentive Opportunities
  Getting Local Community Buy-in and encouraging LID use throughout the community
Planning Process Opportunities

- Weave LID into the Fabric of the Planning Process
- Get internal staff on board
Planning Process Opportunities

- Promote use of LID during predevelopment meetings
- Include and encourage LID on planning and development project checklists
SITE INVENTORY & ANALYSIS

Use this portion of the checklist to document the site inventory and analysis. For additional information on each portion of the analysis, refer to Chapter 2.3 in the Eastern Washington Low Impact Development Guidance Manual.

1. Site topographic features
   Describe site topography and slopes:
   Delineate areas of flat, moderate, and steep slopes (on map):
   Opportunities:
   Constraints:

2. Existing hydrologic patterns & features
   Sub-basin delineation (on map):
   - Streams:
   - Wetlands:
   - Floodplains:
   - Riparian areas:
   - Other:

3. Soil & subsurface hydrology characterization
   Soil type(s): 
   Depth to seasonal high groundwater (feet):
   Bedrock present: (If yes, depth (feet):
   Low permeability layer: (If yes, depth (feet):
   Native Soil Infiltration Rate (inch/hour):
   Correction Factor: 
   Other:

4. Native vegetation & soil protection areas
   Native vegetation type(s):
   Opportunities:
   Constraints:

5. Access
   Opportunities:
   Constraints:

6. Land use controls
   Opportunities:
   Constraints:

7. Utility availability & conflicts
   Opportunities:
   Constraints:
### SITE GOALS

Combine the information analyzed in Section A to develop a composite site map. This map will be used as a basis for LID site design.

Identify specific design goals for the project. Example goals may include the following:

- Meeting Core Element requirements for runoff treatment and/or flow control (2004 SMMEVW).
- Retrofitting existing developments for water quality improvement.
- Reducing site water and energy demands.
- Improving neighborhood aesthetics and mobility.
- Controlling Combined Sewer Overflows.
- Other: _______________________

<table>
<thead>
<tr>
<th>CORE ELEMENT</th>
<th>PURPOSE</th>
<th>APPLICABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Preparation of a Stormwater Site Plan</td>
<td>To integrate stormwater management into project planning and design</td>
<td>Applicable to all sites; required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>2 Construction Stormwater Pollution Prevention</td>
<td>To control erosion and prevent sediment and other pollutants from leaving the site</td>
<td>Applicable to all sites; required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>3 Source Control of Pollution</td>
<td>To prevent stormwater from coming into contact with potential pollutants</td>
<td>Applicable to all sites; required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>4 Preservation of Natural Drainage Systems</td>
<td>To maximize the extent to which stormwater discharge patterns, rates, and outfall locations remain the same after a development project</td>
<td>Applicable to all sites; required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>5 Runoff Treatment</td>
<td>To protect water quality in the receiving water by reducing the loads and concentrations of pollutant in stormwater using biological, physical and chemical removal methods</td>
<td>Applicable only to sites that are determined to have sufficient pollutant-generating potential; required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>6 Flow Control</td>
<td>To protect stream morphology and habitat by mitigating the impacts of increased storm runoff volumes and flow rates to streams</td>
<td>Applicable only to sites that discharge to non-exempt surface water bodies; required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>7 Operation and Maintenance</td>
<td>To prevent failure of stormwater treatment facilities or improper discharges due to inadequate maintenance or improper operation</td>
<td>Applicable to all sites with runoff treatment or flow control facilities, required if stipulated as part of a rule, ordinance, or permit issued by local, state or federal government</td>
</tr>
<tr>
<td>8 Local Requirements</td>
<td>To provide for additional conditions or measures needed to protect local water bodies or for other reasons</td>
<td>Applicable to and required for all sites where such measures have been established by local ordinance or rule</td>
</tr>
</tbody>
</table>

Table excerpt from 2004 Stormwater Management Manual for Eastern Washington
C) SELECT LID SOLUTIONS TO MATCH SITE CONDITIONS AND GOALS

Review the LID BMPs to be incorporated on-site to determine feasibility. If not included, provide justification. Refer to the applications, limitations, and infeasibility criteria included in the Eastern Washington Low Impact Development Guidance Manual to determine BMP feasibility.

<table>
<thead>
<tr>
<th>INCORPORATED</th>
<th>NOT FEASIBLE</th>
<th>NOT APPLICABLE</th>
<th>JUSTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 Amending On-Site Construction Soils</td>
<td></td>
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<tr>
<td>4.3 Dispersion</td>
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<tr>
<td>4.4 Bioretention</td>
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<td>4.5 Trees</td>
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<td>4.6 Permeable Pavement</td>
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<td>4.7 Vegetated Roofs</td>
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<tr>
<td>4.8 Minimal Excavation Foundations</td>
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<tr>
<td>4.9 Rain Water Harvesting</td>
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</tbody>
</table>

D) DEVELOP PRELIMINARY SITE LAYOUT

A preliminary site layout should include the information gathered in the site inventory & analysis and the proposed improvements and selected LID BMPs. This layout should show how site goals are being met.

E) SIZING

Each individual LID BMP included in the design must be sized appropriately by the engineer. See guidance on modeling methods provided in the 2004 SMMEW and the 2013 Eastern Washington Low Impact Development Guidance Manual. Submit documentation with designs showing how the calculations were performed and demonstrating the flow control and/or treatment goals are being met.
Planning Process Opportunities

- Encourage LID Friendly Ordinances and Design Standards
- Review and amend your existing ordinances
LID Principles and Code Connections

- Less Imperviousness
- Disconnection/EIA
- Natural Function
- Source Reduction
- Maintenance

- Dimensional standards: lot size, frontage, height, coverage, yards, parking
- Building codes & public works standards (drains, roads, sewers)
- Landscaping, buffers, trees & tree canopy
- Site plan review
- Subdivision, site plan, CC&R;S, stormwater ordinance, utility, enforcement
Planning

What is LID?

Low Impact Development (LID) is a leading stormwater management strategy that seeks to mitigate the impacts of runoff and stormwater pollution as close as possible. Urban runoff discharged from municipal storm drain systems is one of the principal sources of water quality challenges in most urban areas. It can contain pathogens such as E. coli and viruses, oil and grease, sediment, metals, and toxic chemicals that can adversely affect the ocean, chiefs, plant and animal life, and public health.

LID consists of site design approaches and Best Management Practices (BMPs) that are designed to address nonpoint pollution at the source. These LID practices can effectively remove nutrients, bacteria, and metals while reducing the volume and intensity of stormwater flows.

The Ordinance was developed by LID Technical in collaboration and coordination with Department of Environment, California Conservation, Public Health, and organizations, business groups and the building industry.

How does the LID Ordinance affect me?

The LID ordinance requires minimization from a three-quarter inch rainstorm to be captured, infiltrated and/or used onsite at most developments and redevelopment projects where more than 500 square feet of landscape is added. Most single family residences can comply in an even simpler way by installing appropriate Best Management Practices (BMPs) such as rain barrels, permeable pavement, rain garden storage tanks, or infiltration systems to detain or delay the water.

When did the LID Ordinance become effective?

The ordinance was adopted in November 2011 and officially became effective on May 12, 2012. The main purpose of the LID Ordinance is to ensure that development and redevelopment projects mitigate runoff in a manner that captures rainwater at its source, while utilizing natural resources.

LID is the most effective & cost-efficient means of managing stormwater & reducing water pollution.

Other LID benefits include:
- water conservation
- groundwater recharge
- greening communities

To learn more about LID, download the Development Best Management Practices Handbook by visiting LIDonline.org

Low Impact Development (LID) Road Map for Residents and Developers

The Road to LID Starts Here

Low Impact Development (LID) Road Map for Residents and Developers

The City of LA will review all plans for new development and redevelopment projects to ensure that the appropriate BMPs are incorporated to address stormwater pollution prevention goals. During the review process, the plans will be reviewed for compliance with the City’s General Plan, zoning ordinances, and other applicable non-source orders and codes, including stormwater requirements. The reviewer will also determine if project designs need to be modified to address stormwater pollution prevention objectives. Depending on the scale and the type of the project, the review and approval process can take between 2-5 weeks.

Planning

Opportunities

Planning
Incorporate LID site design parameters and locations into GIS Planning Tools.

Use GIS tools to incorporate LID locations for asset management maintenance schedules.
Planning Process Opportunities

- LID can help meet permit requirements for existing and future Small Municipal Separate Storm Sewer Systems (Small MS4s).

**STATE OF NEVADA**
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

**FACT SHEET** (pursuant to NAC 445A.236)

**Permit Name:** General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (“Small MS4s”)

**Permit Number:** NVS040000

**Location:** This permit will immediately affect all or portions of the following areas:
- Carson City
- Douglas County
- Lyon County
- City of Elko
- Nellis Air Force Base, Las Vegas
- Nevada Department of Transportation (within any regulated MS4)
- Coyote Springs.

**Background Relating to the General Permit**

Polluted storm water runoff is often transported to MS4s and ultimately discharged into local rivers and streams without treatment. EPA’s Stormwater Phase II Rule established an MS4

**Additional Information Required in the SWMP.** Additional information will be required to be included in the SWMP. This information will include more details about each of the MCMs, including mapping outfalls, public participation and education, illicit discharge detection and elimination, Low-Impact Development measures, and good housekeeping practices.
Credit Points for LID

(3) LID = up to 25 points, if all development is required to give preference to the use of low-impact development techniques (instead of pipes, channels, or detention) to control the impacts of development on runoff.
Planning Process
Opportunities

Green Infrastructure
Opportunities that
Arise During Municipal
Operations

EPA
United States
Environmental Protection
Agency

EPA 842-R-15-002
January 2015

Office of Wetlands, Oceans and Watersheds
National Estuary Program
Incentive Opportunities

- Getting Local Community Buy-in
  - Provide good information/outreach materials
    - Presentations to Planning Commissions and Boards of Commissioners/Supervisors
    - Presentations to Local Community Leaders
      - BAWN – Building Association of Western NV
      - BANN – Building Association of Northern NV
      - AGC – Associated General Contractors, NV Chapter
      - Local Engineering, Planning, Architecture and Landscape Architecture Firms
      - Landscaping and Gardening Companies
    - Promote LID on your websites and provide access to other on-line resources
Incentive Opportunities

- Local Demonstration Projects

Hosting a Low Impact Development Design Competition

White Paper
October 2013

01/04/2008
## Incentive Opportunities

- Rebates/installation Financing
- Award and Recognition Programs
- Stormwater Fee Discount or Credit
- Development Incentives

### Funding Options and Resources for Local Decision-Makers

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Description</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Taxes/General Funds     | Funds raised through taxes such as property, income, and sales that are paid into a general fund. | • Consistent from year-to-year  
• Utilizes an existing funding system | • Competition for funds;  
• Tax-exempt properties do not contribute;  
• System is not equitable (does not fully reflect contribution of stormwater runoff) |
| Fees                    | Funds raised through charges for services such as inspections and permits.  
Funds raised through developer impact fees are one-time charges linked with new development. | • Specific permit and inspection fees allow for more direct allocation of costs for services provided  
• Addresses potential stormwater impacts related to new construction | • Funding not available for larger projects or system-wide improvements  
• Developer impact fees may be an unreliable source when development slows (due to market downturns/contracts)  
• Requires administrative framework to assess and manage |
| Stormwater Utility      | A stormwater utility generates its revenue through user fees and the revenues from the stormwater charges will go into a separate fund that might be used only for stormwater services. | • Dedicated funding source  
• Directly related to stormwater impacts  
• Sustainable, stable revenue  
• Shared cost  
• Improved watershed stewardship  
• Addresses existing stormwater issues | • Feasibility study required for implementation, fee structure, and administration of utility  
• Approval by vote of the local legislative body  
• Perception by the public of a “tax on rain” |
| Grants                  | State and federal grants provide additional funding for water quality improvements. | • Existing sources available for stormwater-related funding  
• Does not require repayment | • Competitive  
• Typically one-time, project-specific, or time-constrained funds  
• Often requires a funding match |
| Bonds                   | Bonds are not a true revenue source, but are a means of borrowing money. “Green” bonds are a new source of funding dedicated to environmentally friendly projects, including clean water projects. | • Existing sources available for stormwater-related funding  
• Can support construction-ready projects  
• Can provide steady funding stream over the period of the bond | • One-time source of funds  
• Requires individual approval for each issuance  
• Requires full repayment  
• Possible interest charges  
• Requires dedicated repayment revenue stream  
• May require design-level documents to be prepared in advance  
• Likely requires voter approval  
• Can have high transaction costs relative to requested amount  
• May require significant administrative preparation to issue |
| Loans                   | Low-interest loans may be secured, but are generally used for planning and capital projects. | • Existing sources available for stormwater-related funding  
• Offers low- or no-interest financing | • One-time source of funds  
• Requires full repayment |
| Public-Private Partnerships | Contractual agreement between a public agency and a private sector entity that allows for the private sector participation in the financing, planning, design, construction, and maintenance of stormwater facilities. | • Can reduce costs to government  
• Significantly leverages public funding and government resources  
• Ensures adequate, dedicated funding  
• Improved O&M  
• Shared risk | • Perceived loss of public control  
• Assumption that private financing is more expensive and belief that contract negotiations are difficult |
<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Author/Organization</th>
<th>Publication Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast Stormwater Utility Survey</td>
<td>Southeast Stormwater Association</td>
<td>2013</td>
<td>Since 2007, the Southeast Stormwater Association has been conducting a biennial survey of rates, structure, billing methods, and many other policies and practices in stormwater utilities in the southeast. Current report is available to members only.</td>
</tr>
<tr>
<td>Says To Make Green Infrastructure Work For Towns and Cities</td>
<td>Winters, Paul, Corey Piazza, and Robert Pirani</td>
<td>2012</td>
<td>This report summarizes green infrastructure practices and presents nine successful ways builders are integrating this innovative technology with land use and site planning decisions to secure space for green infrastructure, find the funding to pay for construction and management responsibilities.</td>
</tr>
<tr>
<td></td>
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<td>This report reviews codes for parcels, lots, sites, communities, and neighborhoods with open spaces and green infrastructure, redevelopment, compact design, mixed-use zoning, site loading, special district design, and stormwater management. The report integrates land use infrastructure, including zoning codes/rules and NRDES stormwater permit guidelines.</td>
</tr>
<tr>
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<td></td>
<td>This report features case studies on programs across the country, including Chicago, IL, Milwaukee, Wisconsin, Albany, NY, Minneapolis, MN, and Portland, OR.</td>
</tr>
</tbody>
</table>
Recommendations

1. Embrace/Implement LID Measures in the Planning Process
2. Promote LID Friendly Ordinances
3. Review and Amend Existing Ordinances/Design Standards
4. Build/Publicize Demonstration Projects
5. Explore Other Incentives
6. Foster LID Education/Outreach w/Staff and the Broader Community.
Final Thoughts

- Local Information available
- Change is here, be adaptive
- Water is essential for all life
- Healthy water, healthy economy
- Think Big Picture, Focus on Details
Presenters

- Lynn Zonge, Geomorphologist, Resource Concepts, Inc., Lynn@rci-nv.com, (775) 883-1600 x232

- Lynnell Garfield-Qualls, M.S., CPESC, Hydrologist, City of Reno, garfieldl@reno.gov 775-334-3395, www.tmstormwater.com

- Brenda Hunt, Watershed Program Manager, Carson Water Subconservancy District, brenda@cwsd.org, 775.887.9005, www.cwsd.org
Questions and Feedback Time

- Let’s hear from you regarding your thoughts, concerns, opportunities!