3 - Introduction to Runoff Reduction

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Module Content

- Runoff Reduction Concept
- The Runoff Reduction Method

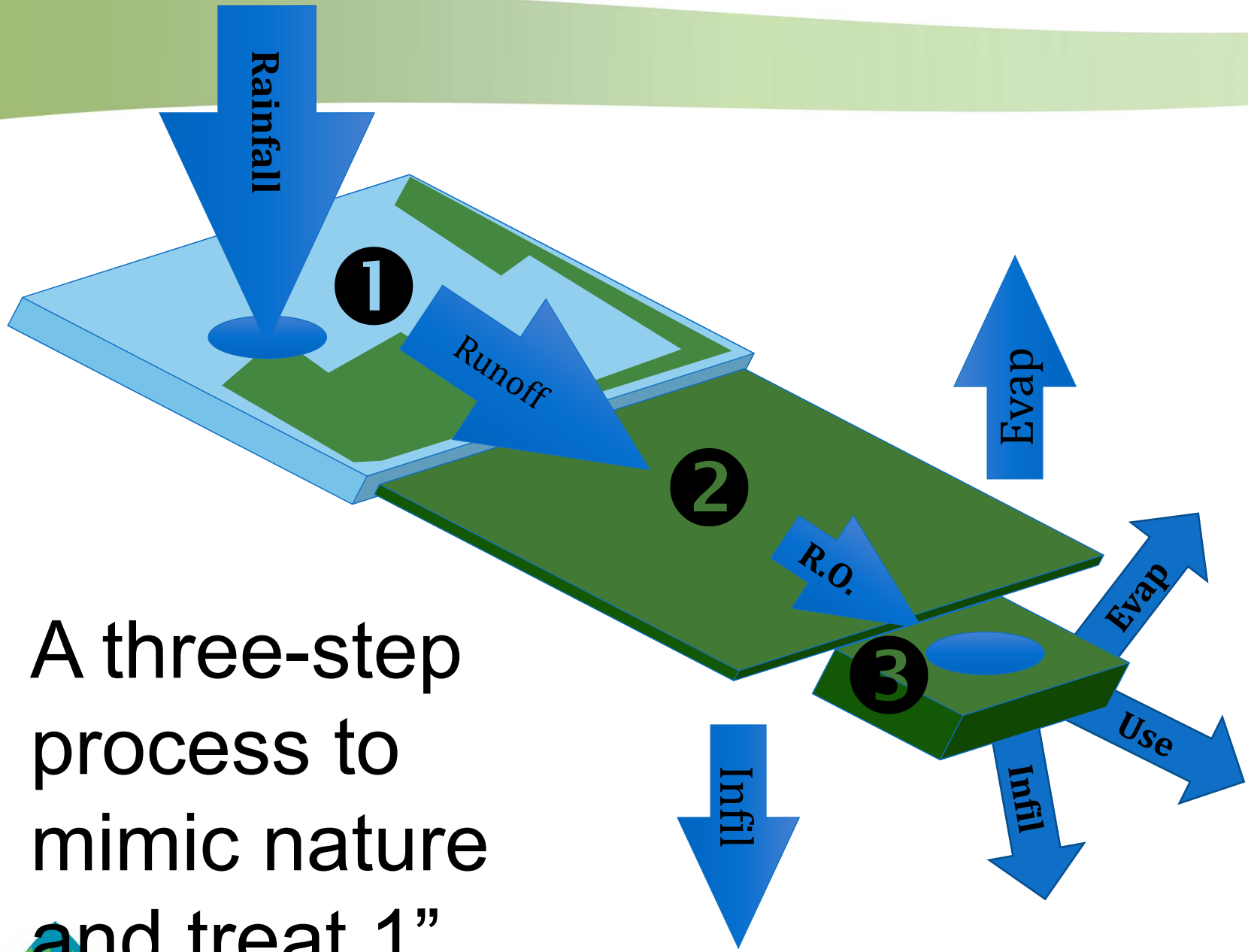
One Approach to Runoff Reduction

- The Runoff Reduction Method
- Based on CWP work in the Chesapeake Bay
- Simplified and modified for Nashville
- Accepted by TDEC
- Uses:
  - A 3-Step site design process
  - A easy-to-use Runoff Coefficient to measure volume captured
  - Low Impact Development
  - Green Infrastructure Practices

One Approach to Runoff Reduction

- The Runoff Reduction Method
- Based on CWP work in the Chesapeake Bay
- Simplified and modified for Nashville
- Accepted by TDEC
- Will be used by other Tennessee cities and counties :

✓ Bristol ✓ Johnson City ✓ Elizabethton ✓ Knox County ✓ Maryville ✓ Alcoa	✓ Hamilton Co ✓ Collegedale ✓ East Ridge ✓ Lakesite ✓ Lookout Mtn ✓ Red Bank ✓ Ridgeside ✓ Soddy-Daisy	✓ Nashville ✓ Franklin ✓ Clarksville ✓ Gallatin
✓ Other unknown jurisdictions that refer to Knox Co., Hamilton Co., or Nashville design manuals, by ordinance, resolution or policy		

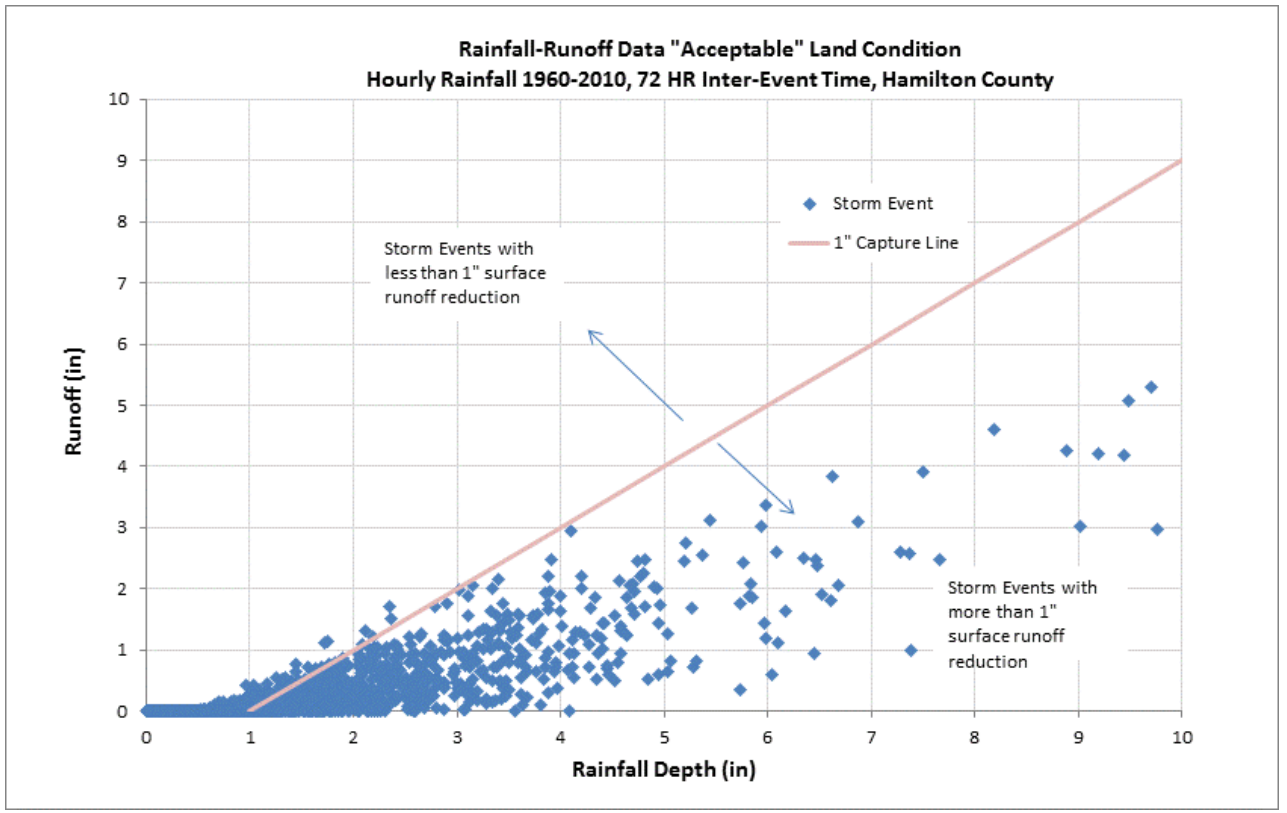


A three-step process to mimic nature and treat 1”

The Runoff Volume Coefficient (Rv)

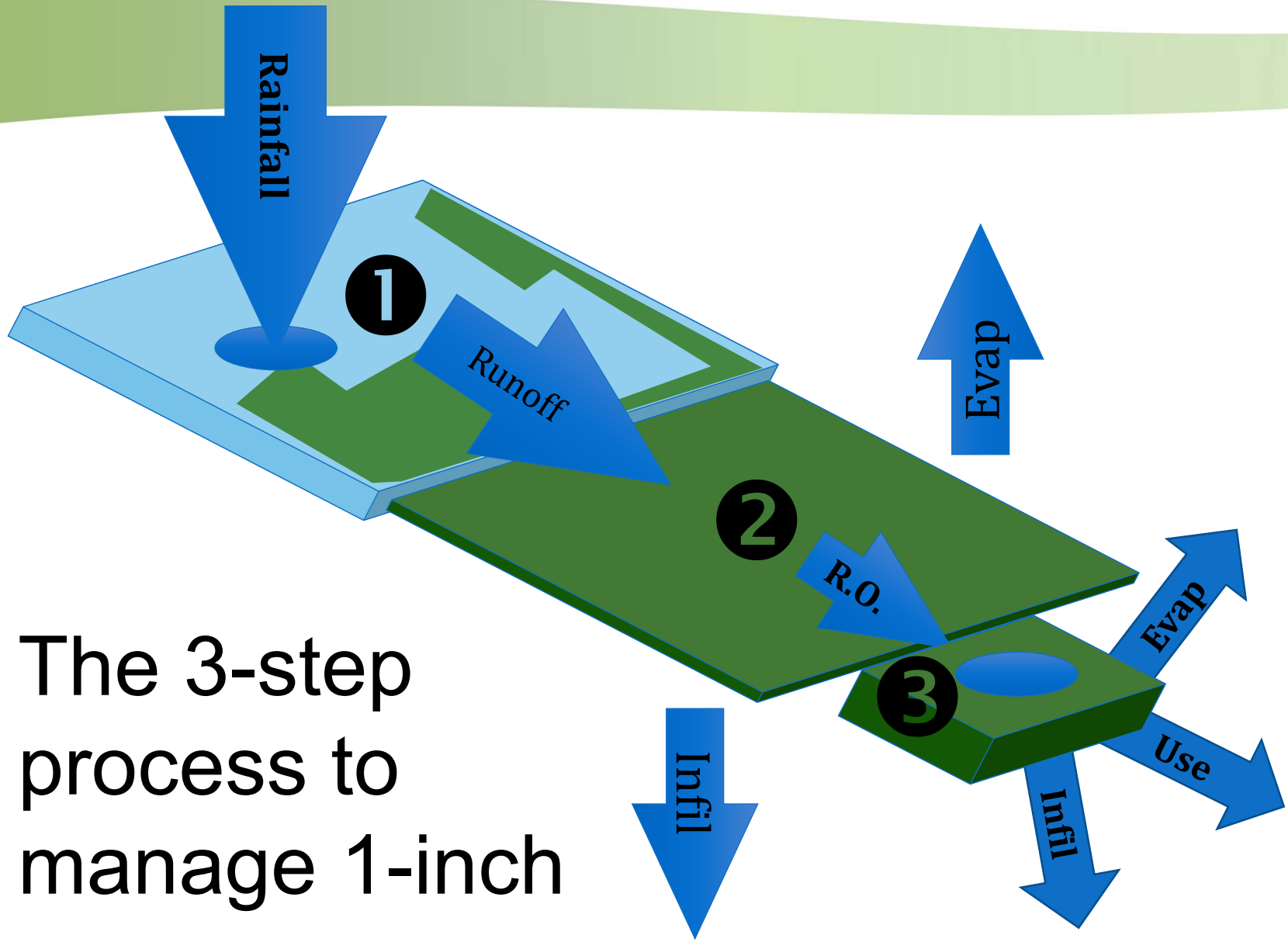
- **Not** related to Rational Method Rc
- Represents the volume of average annual runoff
- Low Rv = Low Runoff, High Capture
- Determined using continuous simulation modeling
  - Long-term local rainfall data
  - Local hydrologic soil group data
  - Basic land cover types (forest, meadow/turf, impervious)
  - Other hydrologic and climatic parameters (interception storage, evaporation, transpiration rates, etc.)

The Runoff Coefficient (Rv)



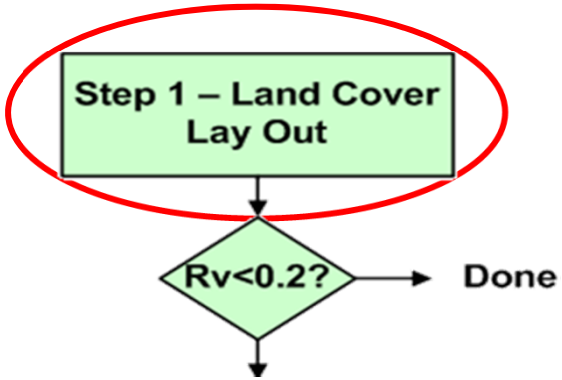
$$Rv = \frac{\text{Average Annual Rainfall Capture}}{\text{Average Annual Rainfall}} \leq 0.2$$

The 3-step process to manage 1-inch



3-Step Site Design Process

1. Land cover lay out



Goals:

- Minimize impervious cover and mass site grading
- Maximize:
  - ✓ Natural areas
  - ✓ Green spaces
  - ✓ Vegetation
  - ✓ Native, un-compacted soils, especially well-draining soils

Low Impact Development is NOT required … but is strongly encouraged

Design activities:

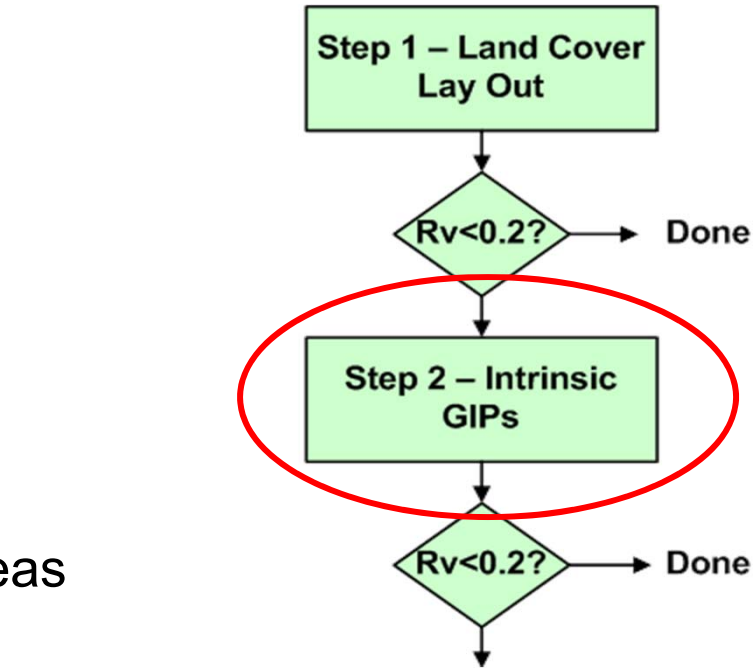
Low Impact Development Practices
(e.g., impervious area placement and minimization, reduced soil disturbance, forest and tree preservation, clustering, etc.)

3-Step Site Design Process

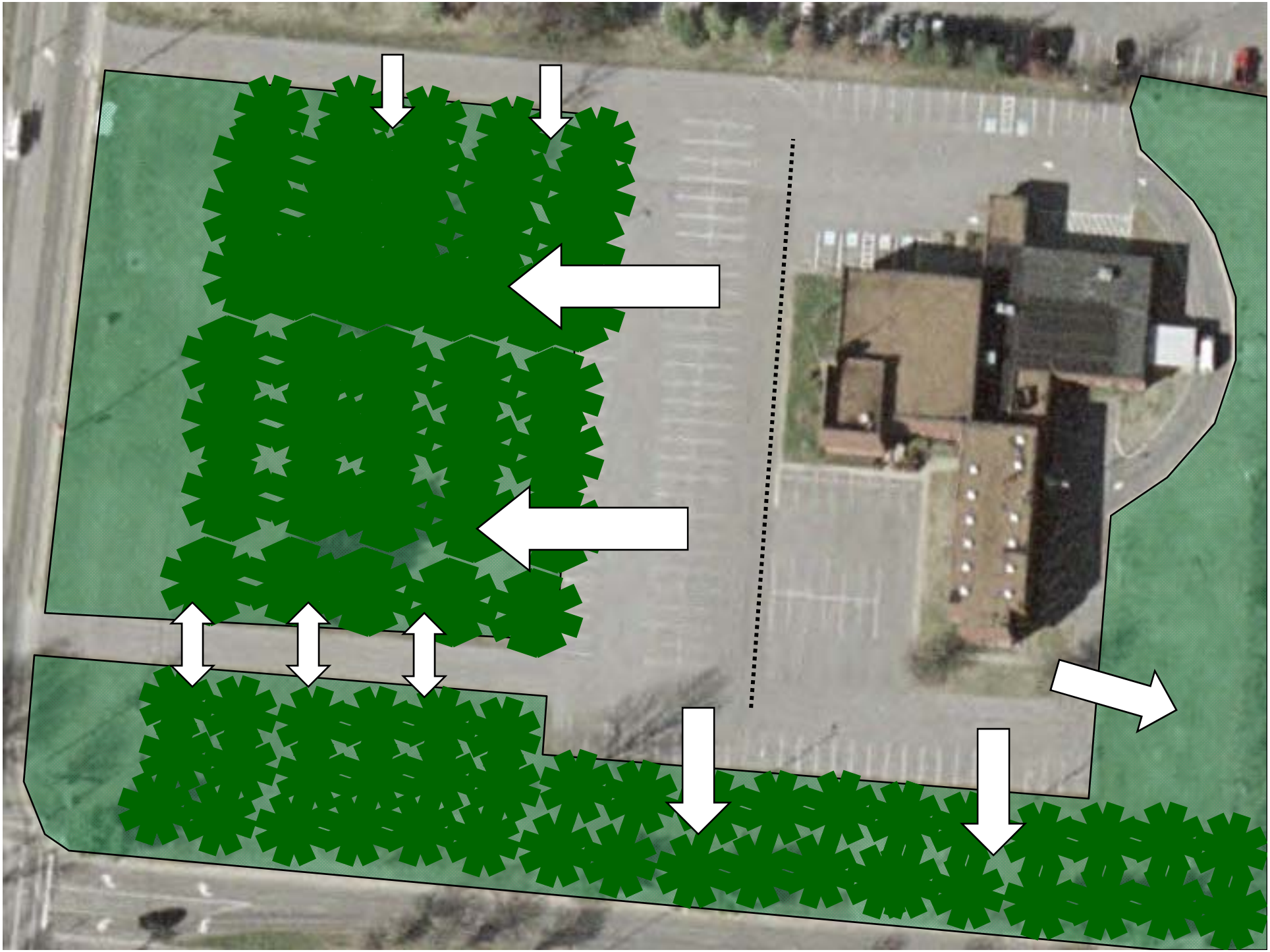
1. Land cover lay out
2. Intrinsic GIPs

Goal:
Enhance the ability of land cover choices to reduce runoff volume

Design activities:
- ✓ Disconnection of impervious areas (e.g. rooftops)
- ✓ Sheet flow impervious areas to pervious areas
- ✓ Reforestation



Intrinsic GIPs are NOT required … but are strongly encouraged



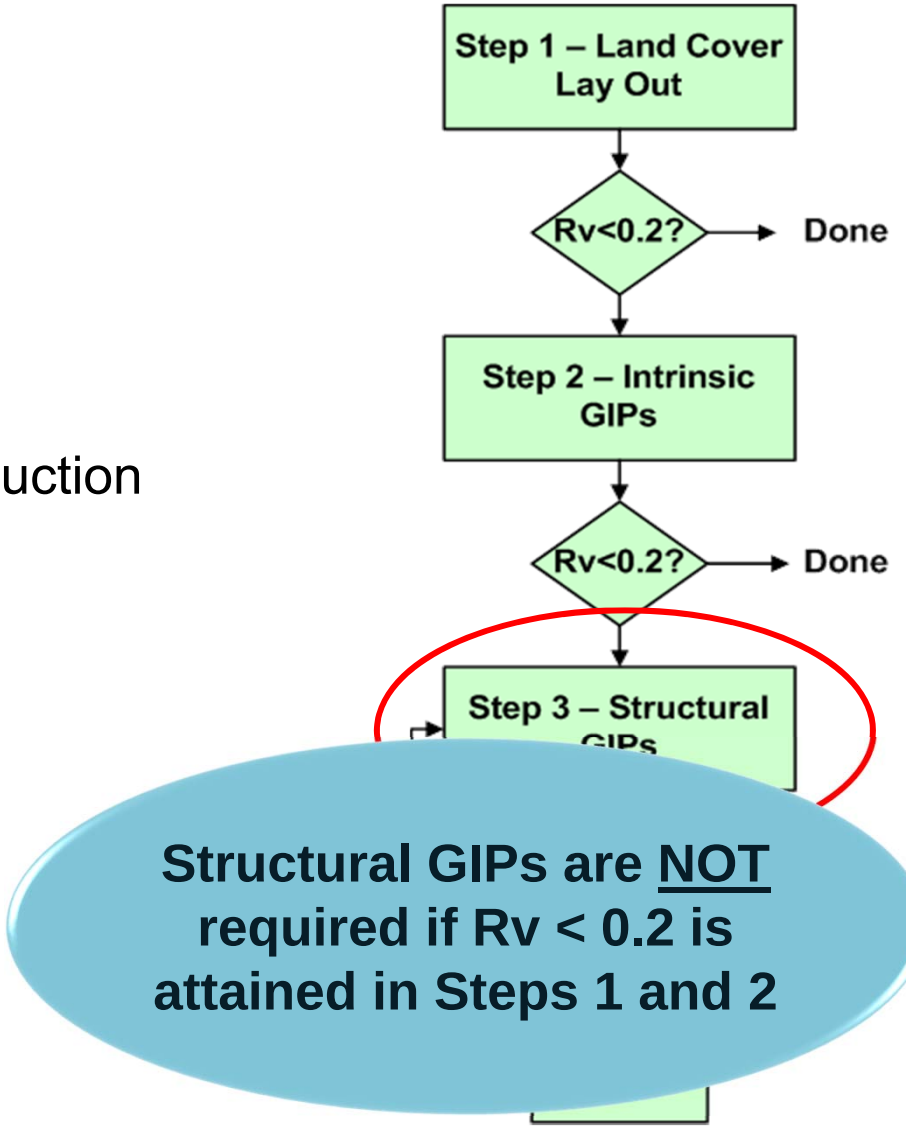
3-Step Site Design Process

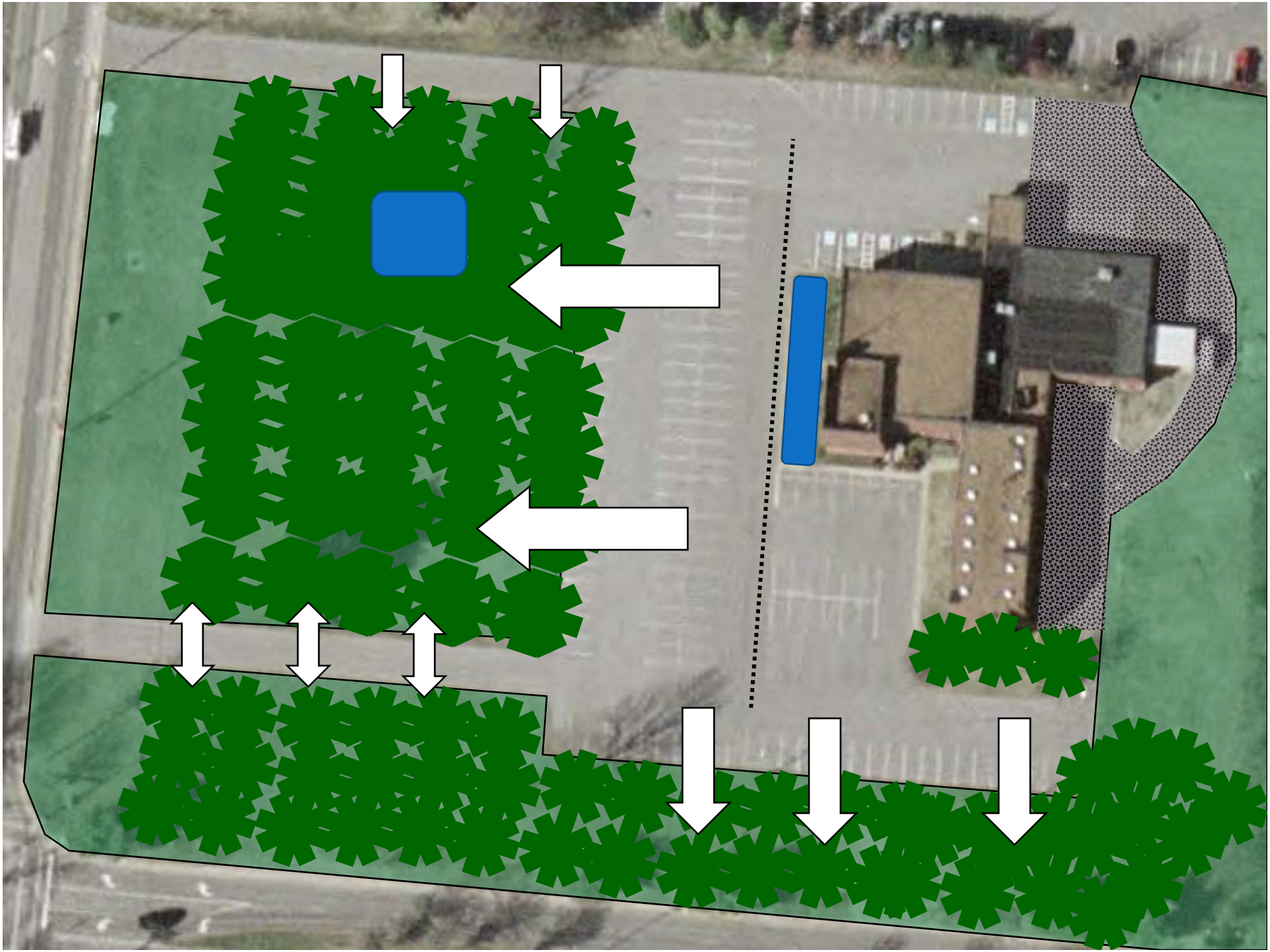
1. Landcover lay out
2. Intrinsic GIPs
3. Structural GIPs

Goal:
Use GIPs to finish 1” volume reduction (achieve Rv ≤ 0.2)

Design activities:

- ✓ Bioretention & Tree Planters
- ✓ Green roof
- ✓ Permeable pavement
- ✓ Infiltration trench
- ✓ Cisterns
- ✓ Water quality swales
- ✓ Dry pond.





Module Topic Summary

- Runoff Reduction Concept
- The Runoff Reduction Method

Questions?