

REQUEST FOR BOARD ACTION

HENDERSON COUNTY BOARD OF COMMISSIONERS

MEETING DATE: September 7, 2021

SUBJECT: Low Impact Development Initiative

PRESENTER: Environmental Advisory Committee

ATTACHMENTS: Yes

- 1. Low Impact Development Initiative**
- 2. LID Powerpoint**

SUMMARY OF REQUEST:

On October 10th, 2019, the Henderson County Environmental Advisory Committee (EAC) voted on the final version of the Low Impact Development Initiative. On October 14th, 2019, the Henderson County Environmental Advisory Committee (EAC) submitted a letter to the Board of Commissioners presenting the Low Impact Development Initiative. The document can be included as an appendix with designer and engineering Request For Qualifications (RFQs) that are released by the County. This initiative is not an attempt to increase regulation or create statutory requirements. Rather it should act as a guidance document for both county staff and outside consultants to aid in the decision-making process in a cradle-to-grave approach.

BOARD ACTION REQUESTED:

The Board is requested to adopt the attached Low Impact Development Initiative to be included as an appendix for RFQs.

Suggested Motion:

I move that the Board adopt the attached the Low Impact Development Initiative to be included as an appendix for designer and engineering RFQs.



HENDERSON COUNTY ENVIRONMENTAL ADVISORY COMMITTEE

ANDREW MYERS · CHRIS GROSE · LUCY BUTLER · JOHN HARRISON
RAYMOND SAVAGE · SHANE LAUGHTER · STEPHEN TILLOTSON · GRAYDON NANCE

To: Henderson County Board of Commissioners

Date: October 14, 2019

Re: Low Impact Development Initiative

Please find the attached Low Impact Development (LID) Initiative. The intention of this document is to provide a general framework for future county development projects. Our desire is that a LID approach will be taken seriously from the beginning to end of a project, from conceptual planning through construction, and continually in the long-term operation and maintenance of the site.

Ideally, this document would be included as an appendix with designer and engineer RFQs that are released by the County. This guidance is not an attempt to increase regulation or create statutory requirements. Rather it should act as a guidance document for both county staff and outside consultants to aid in the decision-making process in a cradle-to-grave approach.

Ultimately, the goal of this initiative is to give Henderson County residents better capital improvement projects for the same price. We must demand more innovation and more creativity from our development consultants—we are paying them for that anyway!

Respectfully,

Henderson County Environmental Advisory Committee

Low Impact Design Initiative

The natural resources within Henderson County are a rare and valuable asset. Our position in the French Broad valley is uniquely flat and is surrounded by the Southern Appalachian Mountains. Steep bedrock and cobble-lined streams cascade down to the valley, emptying into lethargic sand-bed streams such as Mud Creek and the French Broad River. This natural landscape constrains development, transportation, and agriculture within the county.

Due to the natural topography, historic development practices, and high rainfall accumulation, Henderson County's urban and suburban areas are experiencing symptoms of urban stream syndrome. Urban stream syndrome is exhibited by a flashier hydrograph, elevated concentrations of nutrients and contaminants, altered channel morphology, and reduced biotic richness in the form of increased dominance of pollution-tolerant and invasive species. This makes our land, and specifically our streams, significantly less attractive to citizens and visitors.

The intent of this policy statement is to encourage county staff and site development consultants (architects, engineers, and landscape architects) to approach capital improvements as Low Impact Developments (LID) throughout the entire process, from land acquisition through site planning to long term operation and maintenance. Our hope is that the Henderson County government can provide leadership on these issues—showing a more responsible way to develop or re-develop a site—and set an example as stewards of this great land by building projects in such a way that increases the health of our water bodies as opposed to continuing business as usual: exacerbating the symptoms of urban stream syndrome.

A LID approach to site development does not have to include large, expensive structural measures, but should consider the whole process, leveraging conservation practices and smart-design decisions where practical. Some considerations to include in this approach are:

- site selection
- impervious surface reduction
- limitation of site disturbance (leave areas undeveloped)
- site layout with less space (pedestrian-based instead of vehicular-based infrastructure)
- structural stormwater measures
- infiltration potential
- bioremediation
- vegetated roofs
- capture and reuse
- extension of stormwater flow paths

This is not an exhaustive list of considerations, rather an example of ideas to exploit throughout the site development process. If any of these considerations are outside of a particular project's budget, then they should be left on the cutting-room floor. But, if these types of measures can be exploited for the same cost to County, then they should be used. Ultimately, the goal of this guidance is to give Henderson County residents contextually appropriate capital improvements that have been designed with the wholistic LID approach, for the same price as conventional development.

END OF MEMORANDUM

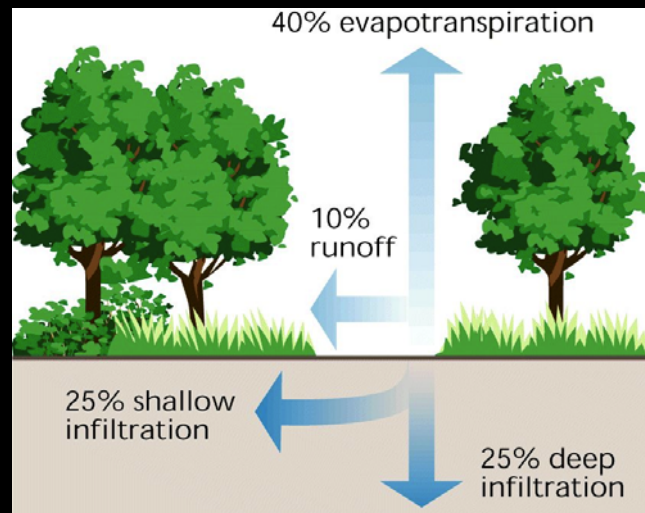


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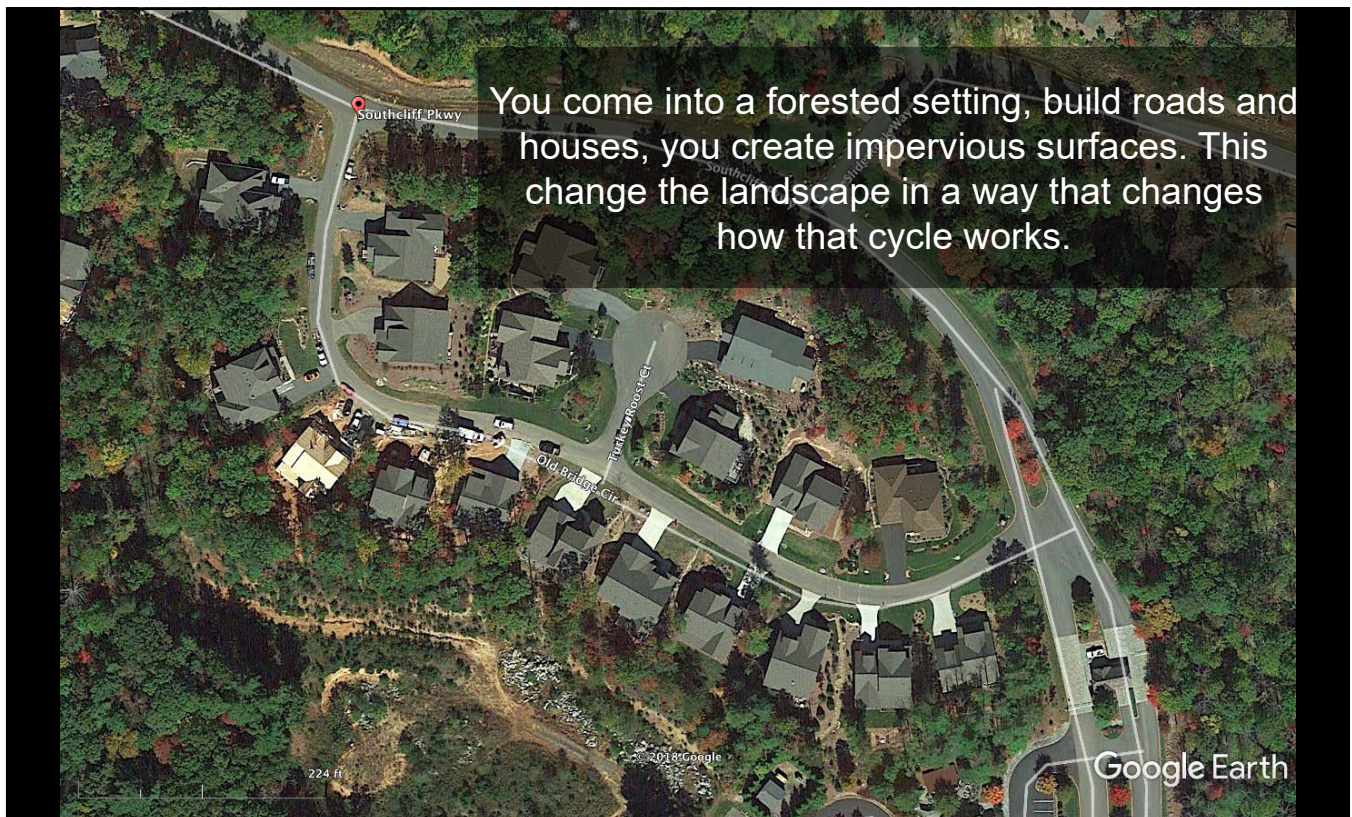


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In general, in a forested area, you'll have only about 10% of rainfall throughout the year as run off. 40% evaporates. 25% is removed via shallow infiltration, and 25% via deep infiltration.

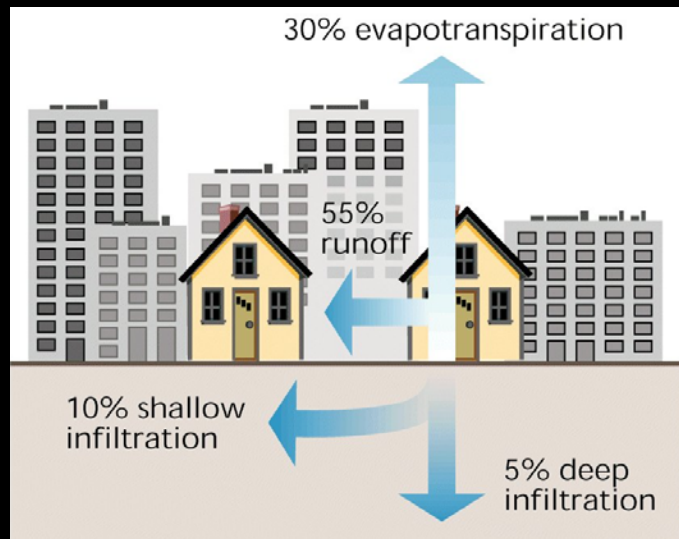


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Now when you have a built up environment, you have much more run off, less evaporation, and less infiltration into shallow and deep groundwater systems.



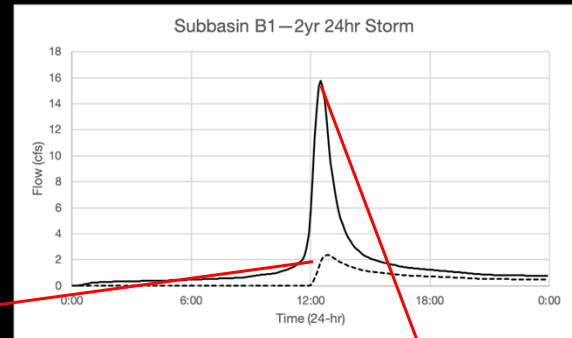
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This is what creates hydromodification, or “urban stream syndrome” that we see with eroding banks and environmental degradation in our streams.

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What that looks like from engineers point of view: This is an example of a hydrograph of a given river.

The little blip at the bottom of the dotted line is a rain event in a forest, before anything is developed - it rains for a long time, and takes a while for the rain to blip up.



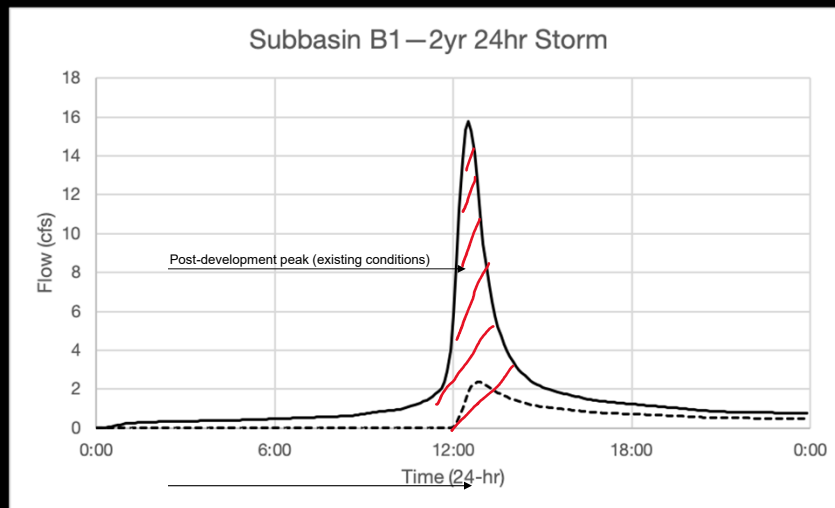
Alternatively, if you look at the above line, which represents a post-development area, you see that after something has been developed, you see a much higher flow after a rain event.

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Hydromodification disrupts and alters stormwater runoff:

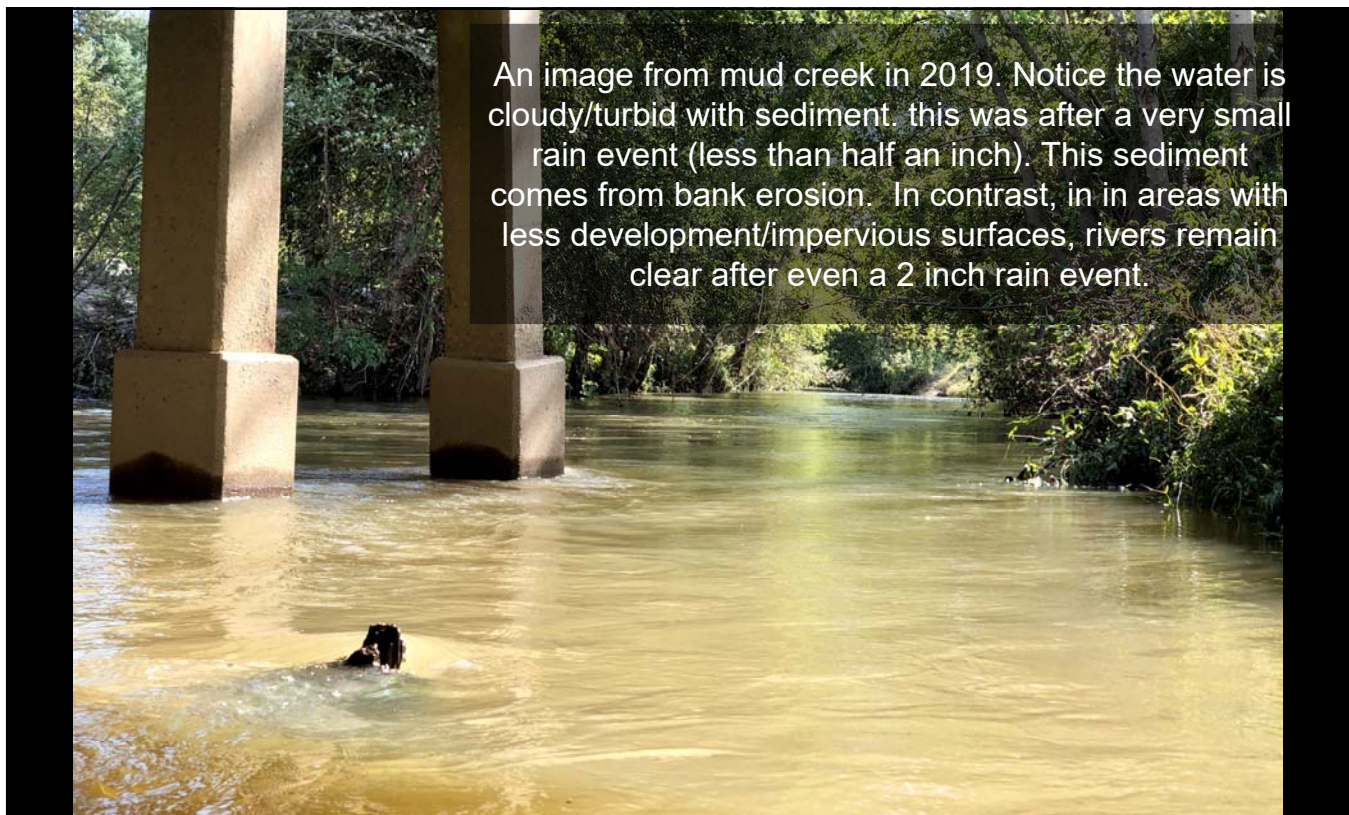
1. Increases the Volume
2. Increases the Intensity
3. Everything happens faster

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All the area under the tall line, this whole area represents a volume of water that previously didn't exist on our landscape. That's for the same rain event. In non engineering terms, these urban watersheds are called "flashy." Meaning the flooding comes up really fast, and really high, and then is gone.

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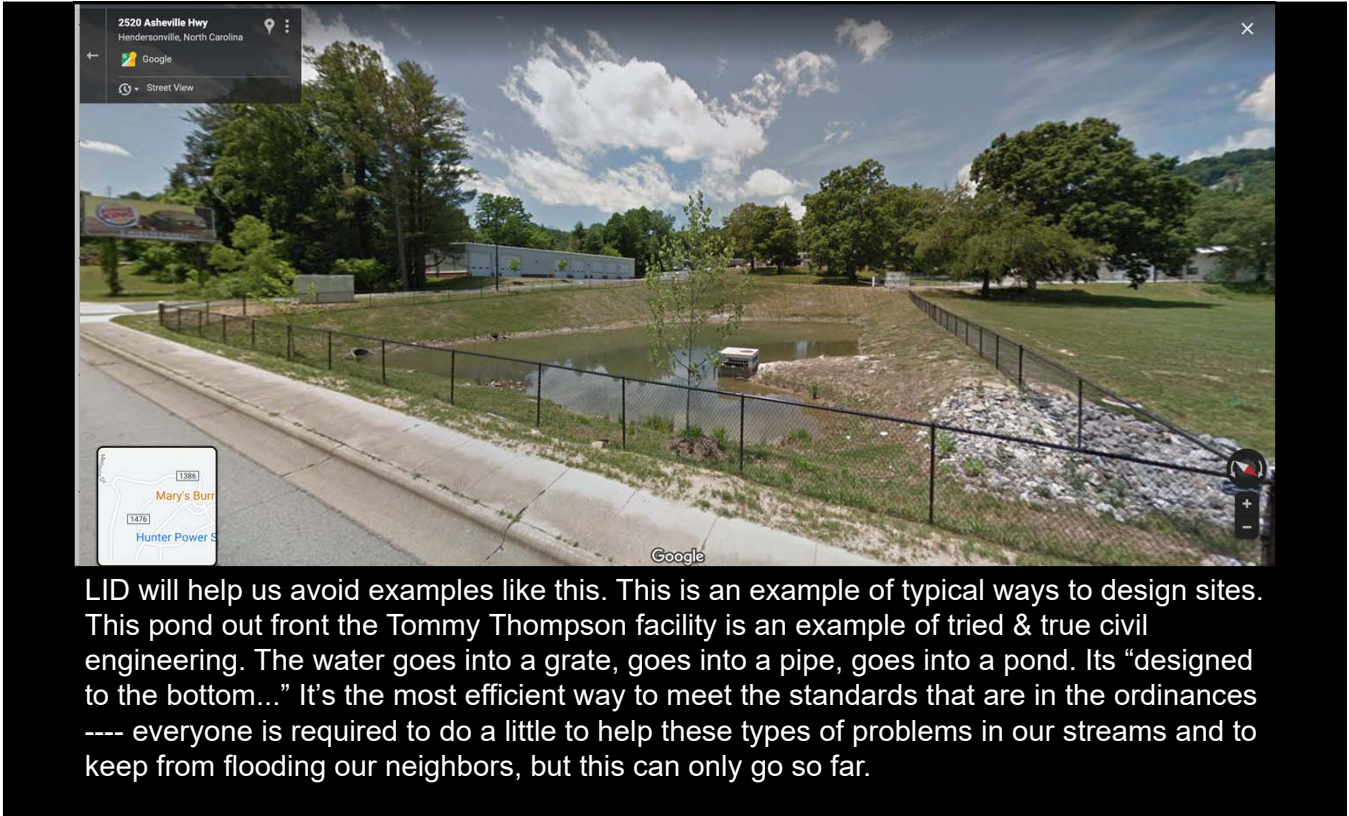
This is on mud creek, showing a big gouge in the river bank due to erosion.



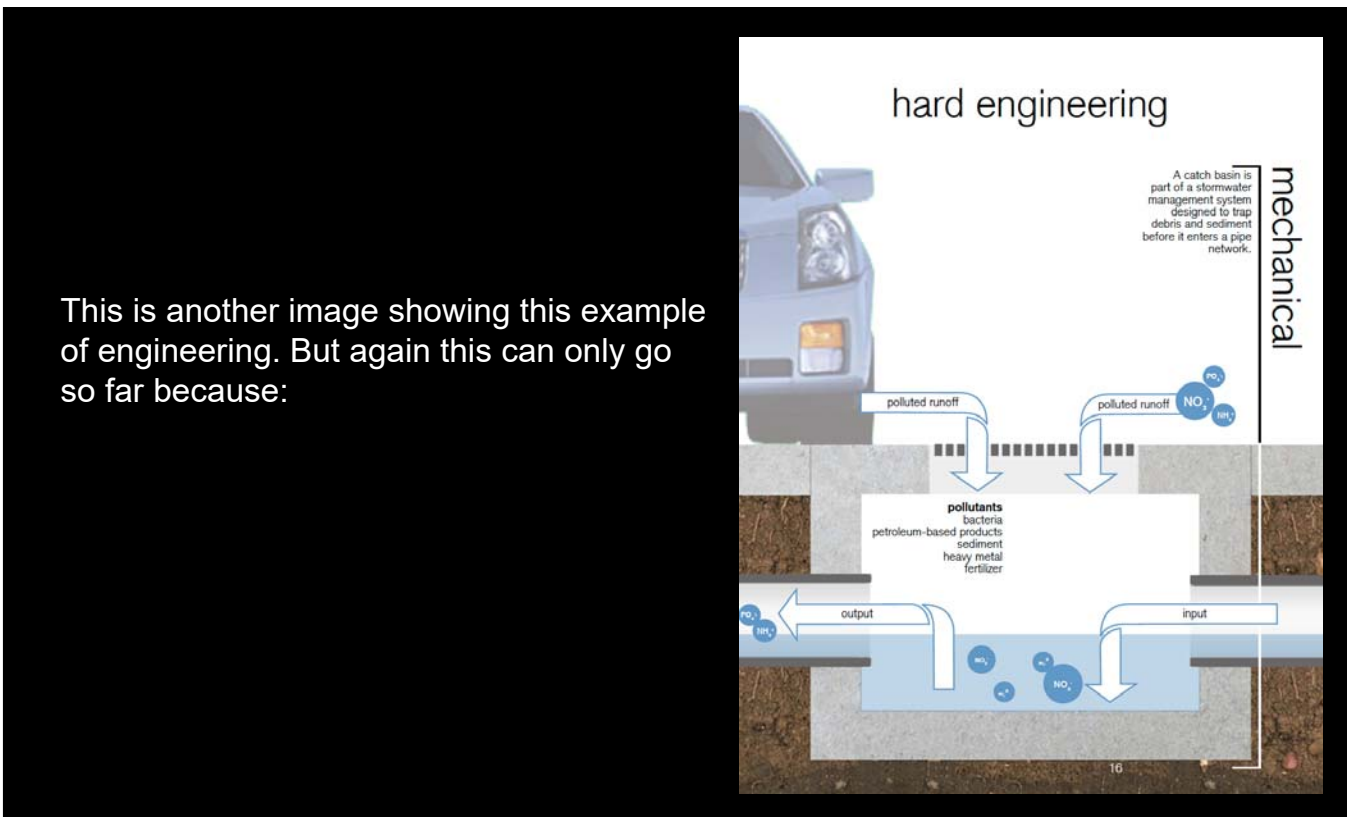
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What is the point of this LID statement?

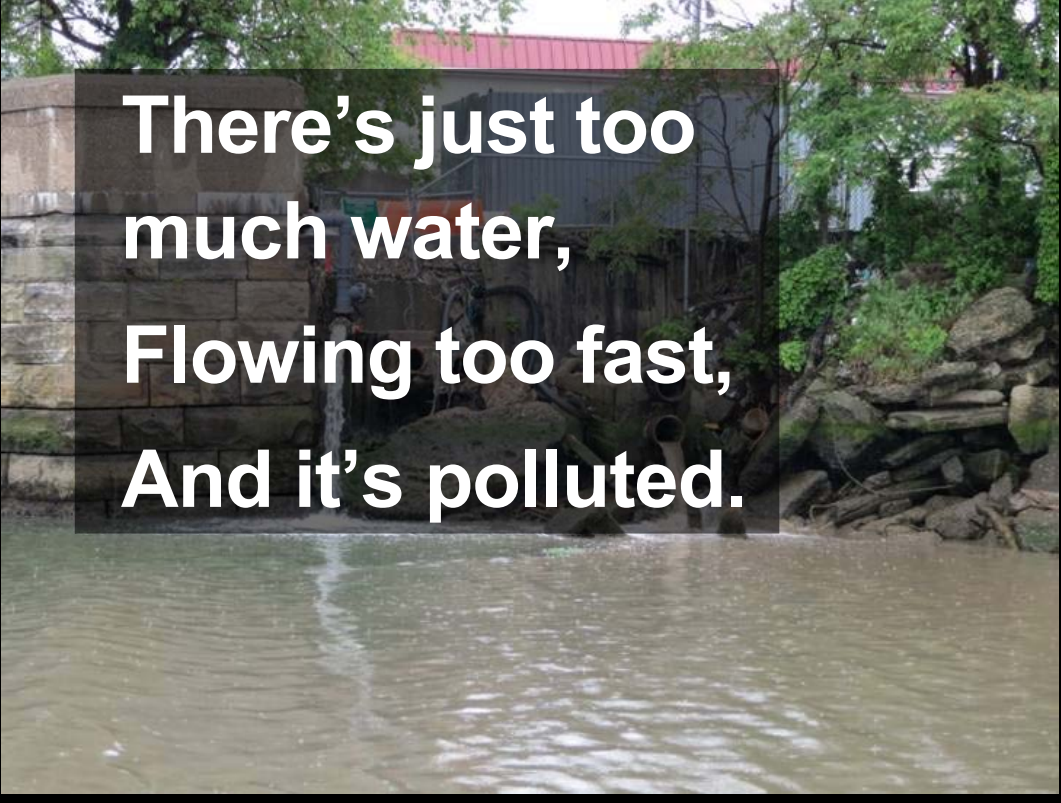
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**There's just too
much water,
Flowing too fast,
And it's polluted.**

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**The LID approach would mimic
natural hydrology to the greatest
possible extent by:**

- 1. Slow, spread, and soak runoff**
- 2. Close to its source**
- 3. Using vegetation as treatment**

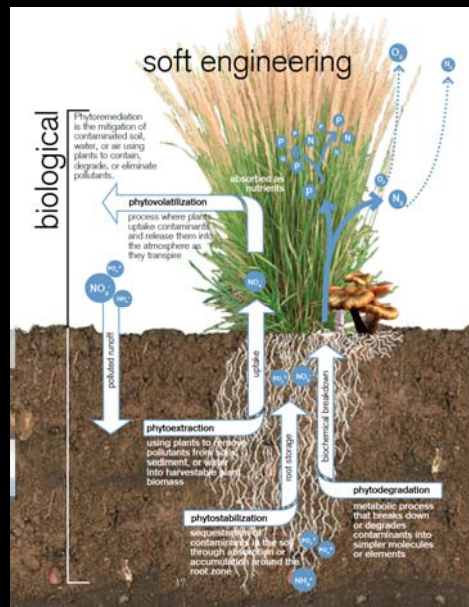
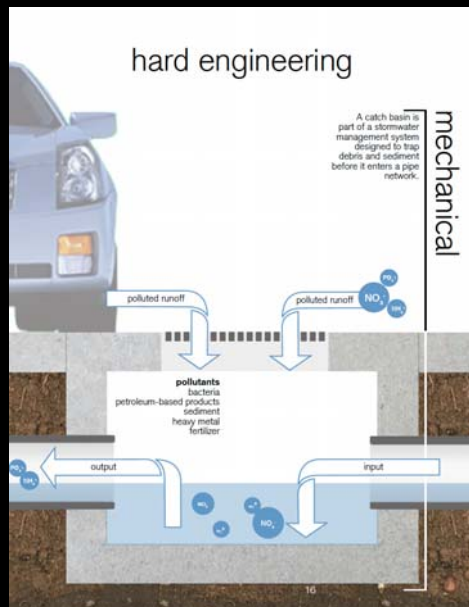
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The old approach to stormwater runoff = just get the water out of here as quick as possible, via pipes, etc.

But we learned the streams can't handle that, so water needed to be stored on site, which is why we now see retention ponds everywhere.



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The LID approach envisions a distributed network of treatment, instead of in a single spot (like a retention pond). The slide on the right shows an example. There are chemical reactions, happening, evaporation, etc. The image on left just shows the water going straight down.

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