



CITY *of* CALABASAS

**Amended Definitions of Pervious Surface
and Permeable Paving**

City Council
October 27, 2021

Background

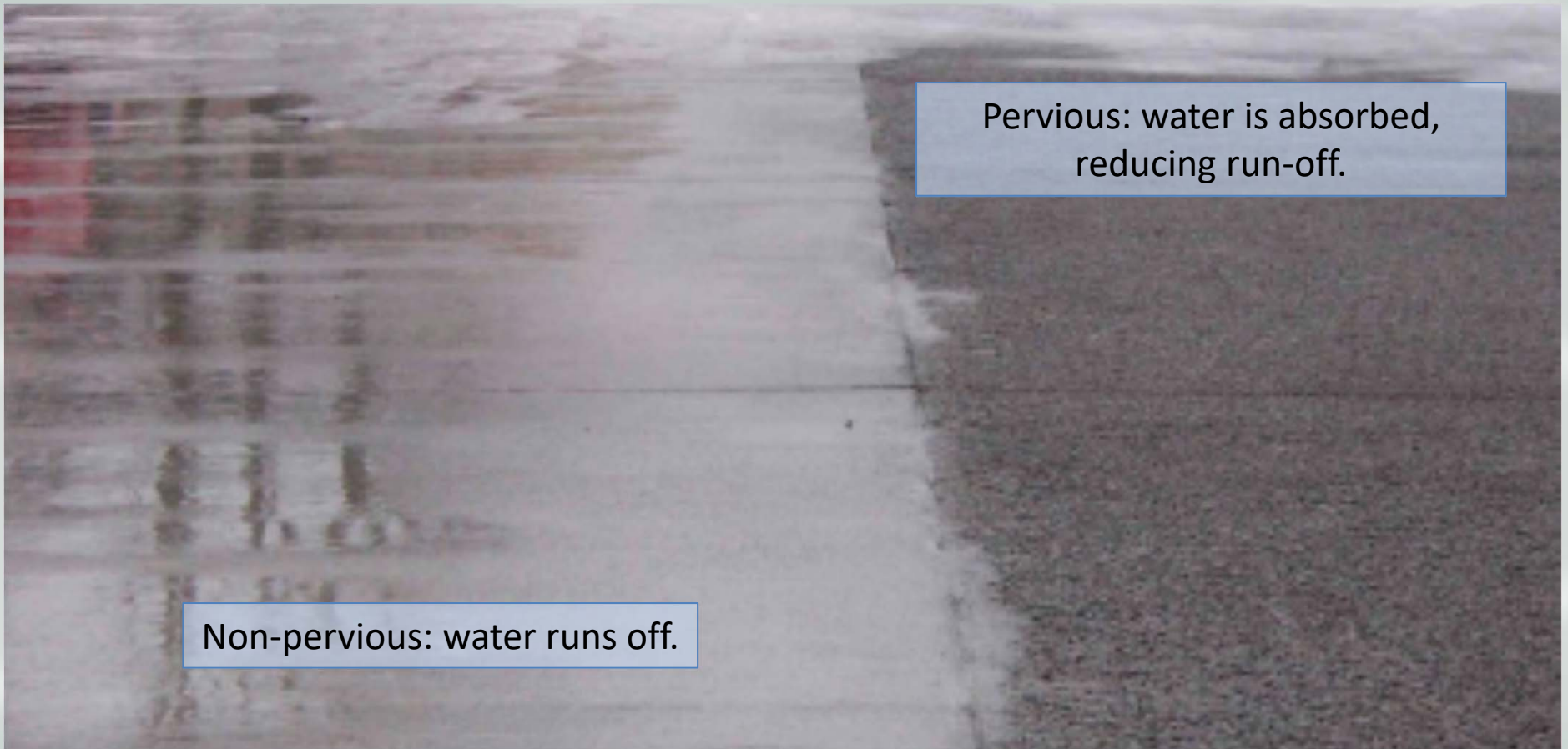
- Planning Commission – September 2, 2021
 - Planning staff presented to the Commission a draft ordinance to amend chapter 17.90 of the Land Use and Development Code by strengthening the definitions of “Permeable Paving” and “Pervious Surface”.
 - The Planning Commission voted (unanimously) to adopt Resolution 2021-718, recommending to City Council approval of **Ordinance 2021-393**.

What is a pervious surface?

Pervious surfaces are those portions of a site not covered with structures or impervious hardscape after development. (Includes *permeable paving*, landscaped areas, and natural areas.)



What constitutes permeable paving?



Well crafted definitions help the City regulate permeable paving systems to ensure they meet pervious surface requirements.



Figure 4-2
Various types of paving units used in PICP

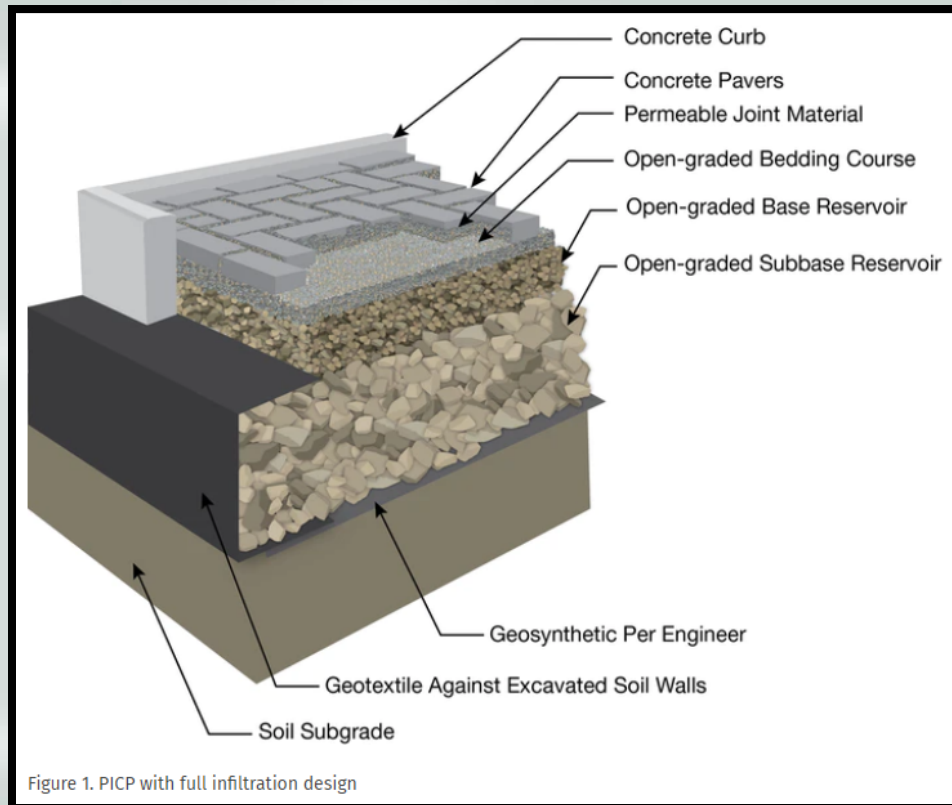
Source: ICPI

Courtesy of ASCE *Design of Permeable Pavement*

Well crafted definitions help the City regulate permeable paving systems to ensure they meet pervious surface requirements.

- The existing definitions of “Permeable Paving” and “Pervious Surface” lack sufficient clarity and specificity, thereby hampering effective application of the standards and requirements, as well as compliance enforcement.
- By incorporating greater specificity and clarity, the revised definitions correct this problem.

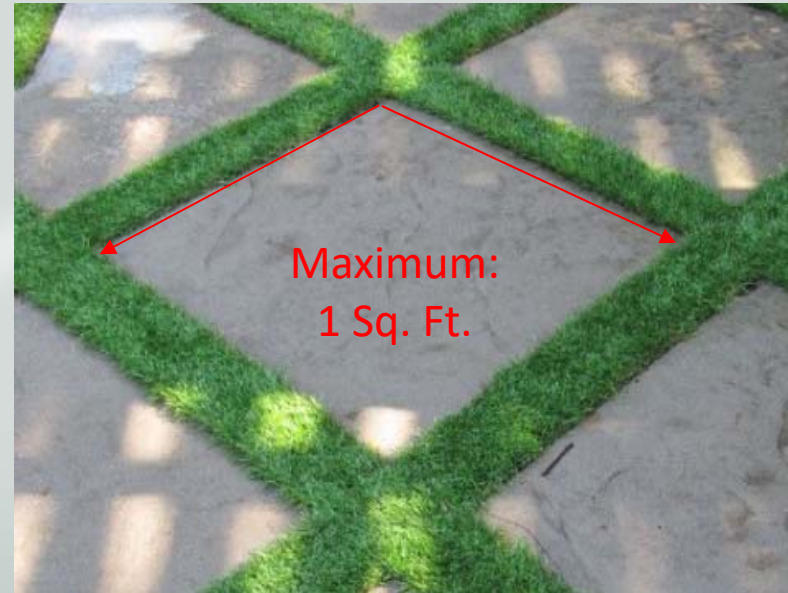
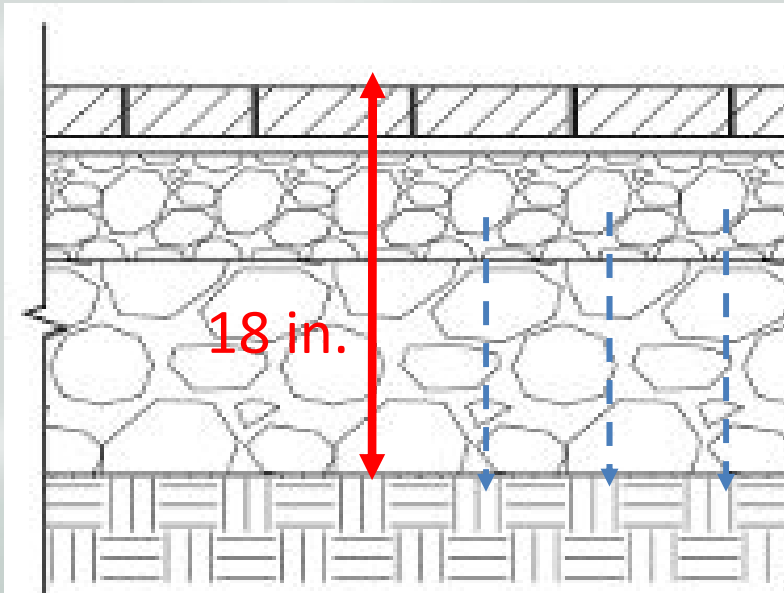
Issues / Problems



- Permeable paving systems are dependent on system design to achieve sufficient water infiltration.
- Not all permeable paving systems actually accomplish water penetration and infiltration, and storm water runoff quantity and velocity can actually increase.

Current Definition of Permeable Paving in CMC section 17.90

The current definition of Permeable Paving (CMC 17.90.020) uses measurable standards, but these parameters are arbitrary and do not actually form a basis for water infiltration.



Permeable paving systems should be defined based on the ability to accomplish water infiltration (instead of runoff), as opposed to using arbitrary measurements of area and depth.



Defining Permeable Paving

GOAL: Establish a realistic design minimum that aids in the intent to reduce storm water runoff.



The American Society of Testing and Materials (ASTM).

- Has established a non-arbitrary and universally accepted method for testing products to quantify infiltration rates and permeability.



The American Society of Civil Engineers (ASCE)

- Has created non-arbitrary and universally accepted design minimums for products and systems utilizing the ASTM testing method.

Specific Design Reference Standards

- **ASTM C1781** – Standard Test Method for surface infiltration rate of Permeable Unit Pavement Systems
- **ASCE 68-18** – Universally understood standards and specifications for Permeable Interlocking Concrete Pavement and similar permeable paving systems

ASTM – Surface Infiltration Testing Method

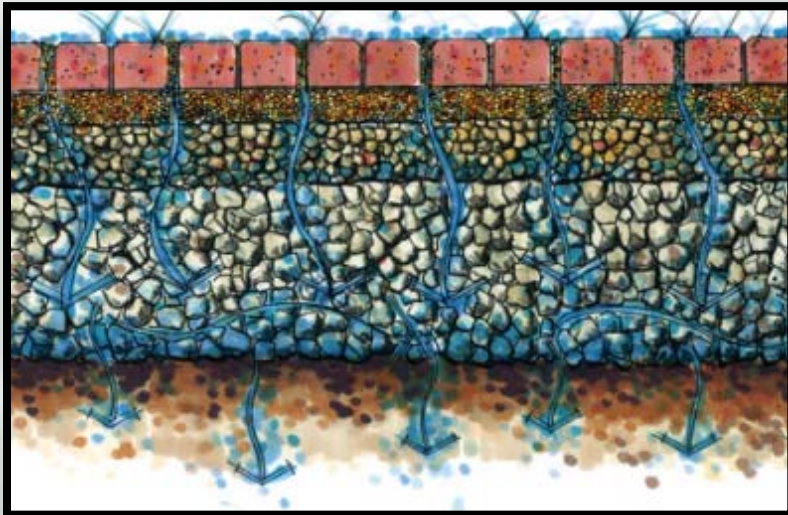
This standard test method is universally accepted for measuring surface infiltration for new and in-place permeable pavement systems.



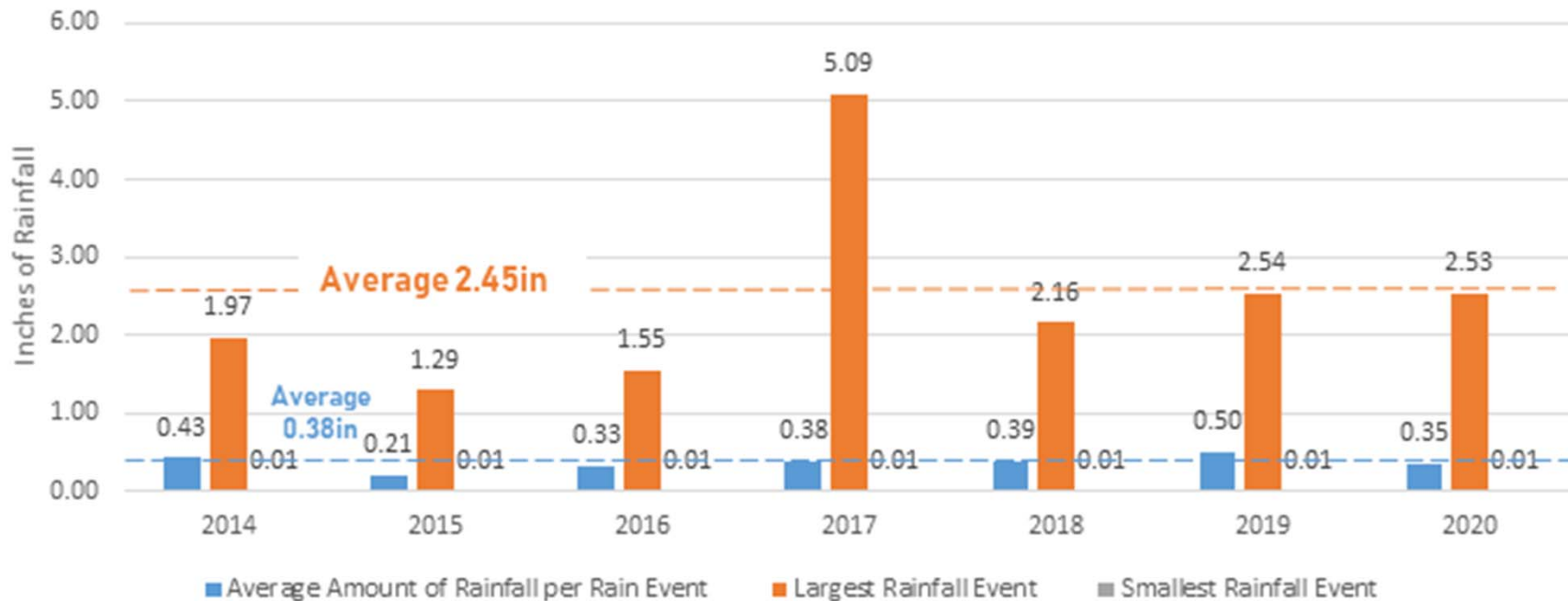
ASCE – Permeable Pavement Design Minimums



- Open area void space: 5% minimum
- In-service infiltration rate: 10in/hr.



(2014 - 2020) Smallest, Largest, and Average Rainfall Events in Calabasas



- The average of all the greatest single 24-hour rain event is **2.45 inches**.
- The overall average amount of rain per event is **0.38 inches**.

Summary

Calabasas rain data (2014 – 20)

- **33 days** of rain on average, representing **9%** of the year
- Average of **2.45 inches** rainfall for the wettest days of the year
- Single greatest amount of rain for one day in the last 7 years was **5 inches**.

Pervious Surface

- Areas that detain or retain storm water, including landscaped areas, natural areas, permeable hard surfaces, and bodies of water.

Permeable Paving

- Minimum of 5% open area or void space
- Minimum of **10 inches per hour** infiltration rate

Proposed Definition for Pervious Surface

“Pervious Surface” means **those** portions of a **property or** site that ~~are only paved with permeable paving materials and are not covered with structures after development.~~ **allow for water penetration into the soil, to a depth of 18 inches or more, such as landscaped areas, natural areas, and developed hardscape areas where permeable paving has been used or which otherwise includes storm water runoff features consistent with Calabasas Municipal Code Chapter 17.26. Pervious surfaces may not be covered with structures that prevent water penetration into soil, to a depth of at least 18 inches. Includes landscaped and natural areas.**

Proposed Definition for Permeable Paving

"Permeable paving" means any paving material **or paving system** that permits water penetration to a soil depth of eighteen (18) inches or more. **Paving systems may include combinations of nonporous surface material poured or laid in distinct and separate sections ~~not exceeding one square foot in area and~~ installed in combination with permeable materials** (examples include crushed stone, gravel or equivalent) **such that at least** two-thirds of the total surface area of a lot ~~that~~ **the system** permits water penetration to a soil depth of eighteen (18) inches or more.

Permeable paving systems that require drainage to the curb or direct connection to the storm drain system do not qualify as permeable paving. Engineered paving systems under this definition include interlocking concrete pavers installed to comply with the standard from the American Society of Civil Engineers (ASCE) – Standard 68-18 for Permeable Interlocking Concrete Pavement, or an equivalent standard for interlocking concrete pavers may be adopted by Resolution by the City Council.

Individual paving units must have a minimum surface open area void space of 5% and a minimum in-service infiltration rate of not less than 10in/hr and complying with ASTM Standard C1781 – Standard Test Method for Surface Infiltration Rate of Permeable Unit Pavement Systems, or an equivalent standard as may be adopted by Resolution by the City Council. Alternative designs, which meet infiltration testing in accordance with ASTM Standard C1781, or an equivalent standard as may be adopted by Resolution by the City Council, may be considered subject to review and approval by the Director. Any permeable paving system must be certified by a licensed civil engineer, landscape architect, or other qualified, licensed professional, as meeting the requirements of this definition.

Recommendation

Staff recommends that the City Council introduce and waive reading of **Ordinance 2021-393**, amending the City of Calabasas Land Use and Development Code (Chapter 17.90) by strengthening the definitions of permeable paving and pervious surface.