

Green Infrastructure Solutions: PERMEABLE PAVEMENT SYSTEM (PPS) AS BEST MANAGEMENT PRACTICES FOR STORMWATER RUNOFF CONTROL

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Introduction

Urban expansion replaces natural land with hard surfaces like roads, sidewalks, rooftops, and parking lots, preventing rainwater absorption and leading to floods, especially in underserved areas. Traditional stormwater sewer systems can’t handle the extreme weather events exacerbated by climate change, are costly to maintain, and fail to restore groundwater. Permeable Pavement Systems (PPS), as part of sustainable urban drainage strategies (SUDS), help cities absorb and manage stormwater naturally, supporting the vision of healthier, more climate-resilient “sponge cities.”

Research Goals

- Address challenges such as: Urban expansion, Climate change impacts, Infrastructure degradation
- Identify areas in Pomona suitable for PPS by targeting vulnerable communities, underutilized public land, and runoff-prone surfaces.
- Build upon the existing pilot project in downtown Pomona as a model for citywide expansion of PPS
- Encourage policy and planning alignment to ensure effective long-term implementation and maintenance of stormwater infrastructure..

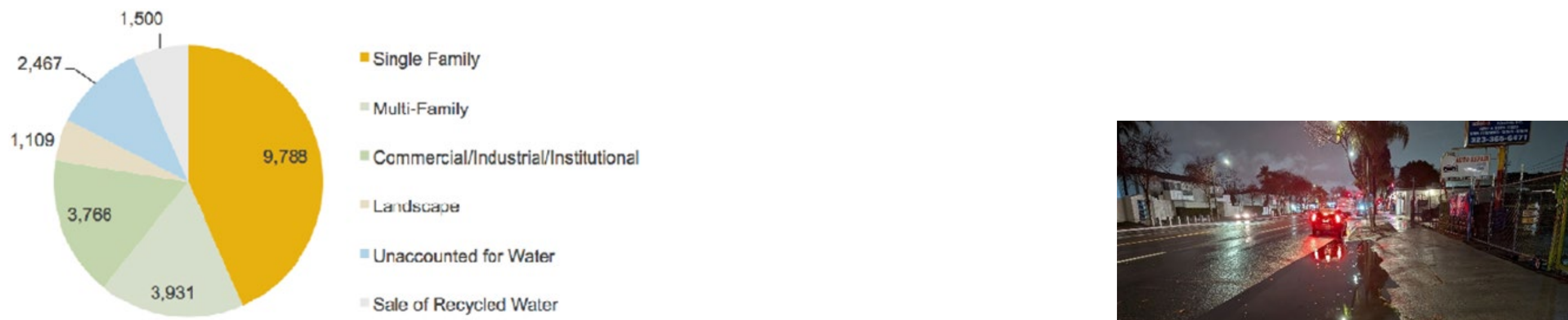
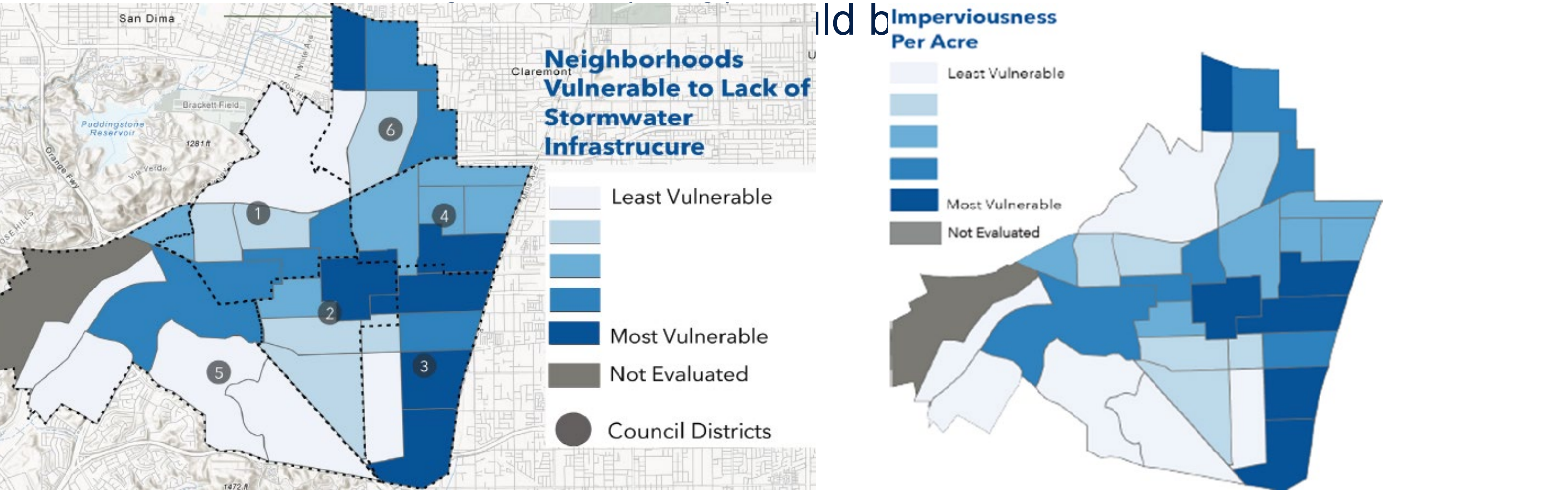
Methodology

This study used a qualitative, site-specific approach combining GIS mapping, equity screening tools, and field observations in Pomona’s Districts 2 and 3 to assess where PPS could be most effective. A comparative analysis of Downtown Pomona and the Elmer Avenue Retrofit Project provided further insight into the practical application of permeable pavement systems.

Results

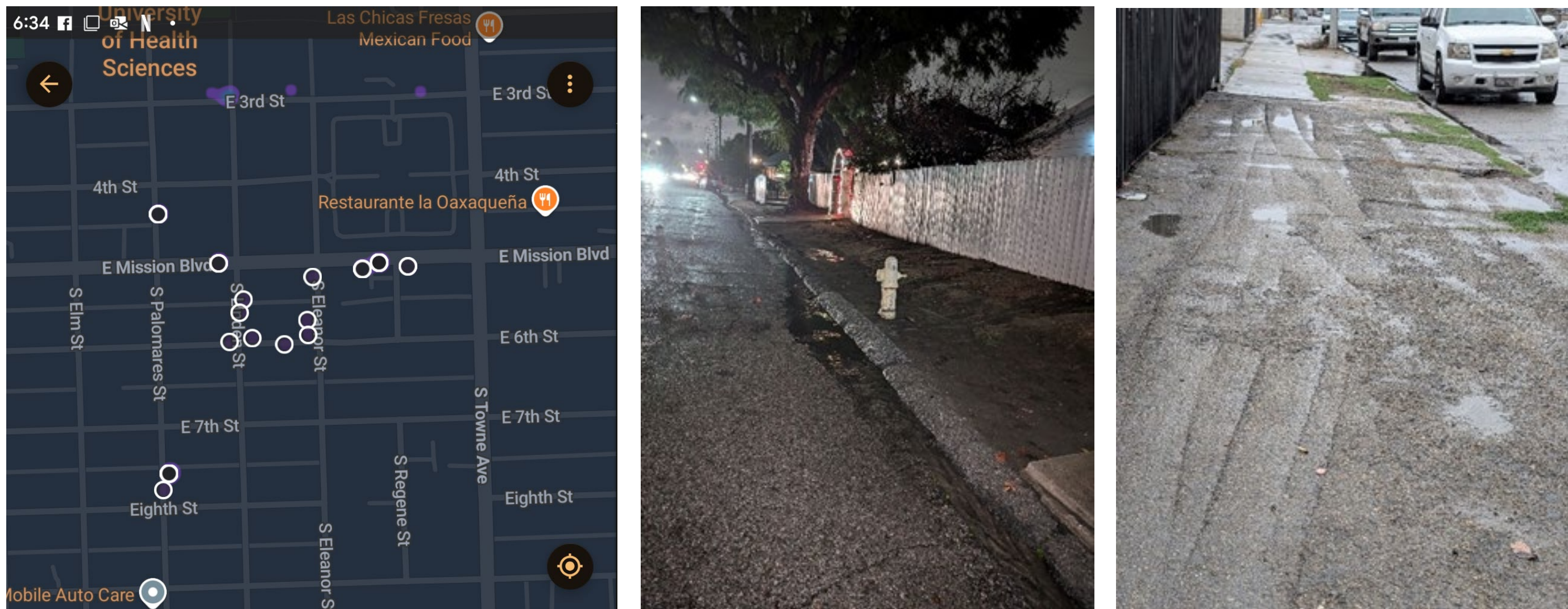
Building on .Existing research and equity models

The commercial, industrial, and residential areas each significantly influence the behavior of stormwater runoff and pollution in urban environments. The study looks at how land use affects the amount of runoff water and pollutants by focusing on Pomona City; District 3, and assess potential areas where



Field Observation & Key Findings

- High Edges on Sidewalks Creating Puddles
- Lack of Greenery and ADA Compliance Issues
- Dirt and Pollutants on Sidewalks
- Irregular Pavement Surfaces Due to Tree Roots



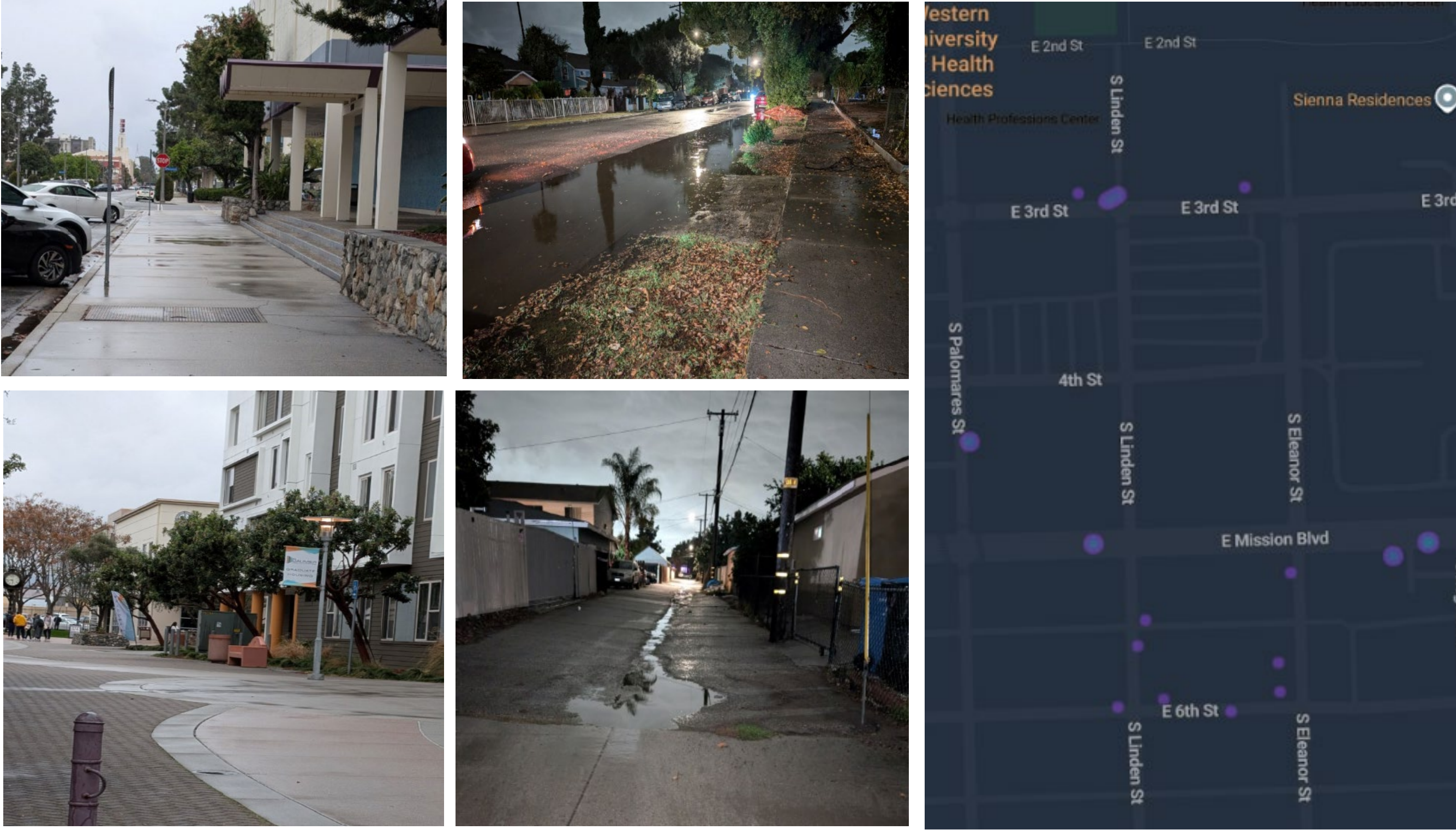
Case Study: The Elmer Avenue Neighborhood Retrofit

Elmer Avenue in Los Angeles faced frequent flooding due to poorly absorbing surfaces that caused runoff and reduced water quality. The project addressed this by replacing traditional pavement with porous materials, allowing rainwater to soak into the ground. It also improved walkability, making the neighborhood more livable



Use existing Pilot project for city wide implementation

Downtown Pomona has already started using permeable pavement, and the results are promising. Streets and alleys stay cleaner and drier, walkways are easier to use, and water runoff is reduced.



Recommendations

Expand Permeable Pavement Beyond the Pilot Area

Based on the District 3 observations including water pooling, broken pavement, and a dearth of greenery, Pomona needs to improve stormwater drainage and sidewalk safety. It would be beneficial to expand on the success of the Downtown pilot project and extend PPS across all neighborhoods.

Engage the Community and City Leaders

Pomona should engage both local authorities and the community to build support for permeable pavement projects. Urban planners can use public meetings, school programs, and town events to explain the benefits (reduced flooding, safer walkways, and environmental improvement), and foster community confidence in the changes.

Conclusion

PPS offer a smart solution to stormwater management by allowing water to pass through the surface and return to the soil, helping reduce runoff and recharge groundwater. This study shows that using PPS in Pomona can help fix flooding, improve water quality, and create cleaner, safer streets. The success of the pilot project in Downtown Pomona proves that PPS can make streets more walkable and welcoming.

References



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