

Introduction

Runoff is a severe issue in urban areas like Los Angeles, where **aging infrastructure** and **highly impervious surfaces** dominate the region, preventing proper absorption and filtration before entering any drainage system. Westlake, a neighborhood in Los Angeles, is disproportionately affected by these environmental challenges caused by insufficient infrastructure and a lack of greenery, which can intensify as climate change continues. Unpredictable weather patterns push these systems beyond their limits, where neighborhoods like Westlake are underprepared to manage such events.

This study will focus on Westlake using bioswales to address water quality and extreme heat issues. This aims to create a **climate-resilient urban space** that will enhance the quality of life for residents in Westlake and improve the local ecosystem. The suitable locations for the bioswale will be informed by successful case studies, geographic information system, and field observations. I will discuss how the precise placement of these bioswales will **address environmental issues, close the disparity gap**, and how this will ultimately play an important role in **improving the quality of life** for all residents in Westlake.

Methodology

Data Analysis

- **Case Studies:** Relate Westlake to the following context-related case studies: Street Edge Alternatives Project- Seattle, Washington and 2024 Annual New York City Green Infrastructure Plan
- **Storm Drainage System Map:** Using Los Angeles County’s storm drainage system map, a GIS map will be developed to provide visual insights into the current catch basins in each area, indicating entry points for runoff into the drainage systems.
- **In-person:** Empirically checked the width of sidewalks, street medians, and on-street parking.

Site Selection Criteria

Criteria	Description	Reason
High Traffic Volumes	Major Roadways, Commercial Corridors, and Intersections	These areas often contain high concentrations of pollutants.
Impermeable surfaces	Surfaces that prevent water infiltration lead to high runoff and contribute to the urban heat island effect	This can reduce runoff, mitigate the impacts of extreme heat, and reduce runoff pollution.
Street Verge	A strip of grass or plants between the sidewalk and roadway	It can be easily incorporated into space without disrupting existing infrastructure. It can be a low-cost solution.

Key Findings

Case Study City of Seattle- Street Edge Alternative Project

Completed in Spring 2001, this project promotes sustainable stormwater management by integrating various low-impact development techniques.

- **Outcome:** The project achieved a total reduction within its 2.3-acre capture area of **97 percent** of stormwater for two consecutive years and The impervious surface was reduced by **11 percent** compared to a traditional street. It was also noted that the key to success is **collaboration and community involvement**.
- **Environmental Benefit:** By creating a **soft-edge environment** reintroduce native plants and reestablishing habitats for wildlife.
- **Challenges & Barriers:** City of Seattle emphasized clarification when repurposing **right-of-way areas**, and highlighting **site-specific constraints** to ensure there are no unexpected failures.

Case Study: City of New York- NYC Green Infrastructure Plan

City-wide strategic plan introduced by the NYCDEP in 2010 to help manage stormwater runoff.

- **Outcome:** Over **7,000** rain bioswales and infiltration basins have been constructed. **Community assistance** created the largest impact on the preservation of the bioswale.
- **Environmental Benefit:** Using **traditional infrastructure and nature-based approaches** like NYC will likely be the most effective approach due to Westlake's built environment.
- **Challenges & Barriers:** Some bioswales suffered **neglect** and need to be maintained, concerns were raised surrounding the **lack of transparency** during construction, and public **right-of-way conflicts**.

Conclusion

The study confirms the feasibility of implementing bioswales in Westlake, proposing **14 potential sites** to be retrofitted in the existing streets. Incorporating bioswales demonstrates **multi-benefit solutions** to address runoff, extreme heat, and environmental inequities seen within Westlake. Serving as the first step to address runoff and related environmental issues.

Analyzed case studies suggest that combining **traditional sewer systems with green infrastructure** is a more practical approach and highlights the importance of creating **site-specific swales** to maximize the benefits in each proposed location. The case studies also mention the importance of **community involvement** to avoid right-of-way issues and bioswale neglect, but most importantly, the studies emphasize community involvement as a way for residents to create a sense of place and become actively engaged in their community.

Although the catch basins do not determine the final decision of the proposed bioswale, it **addresses issues in infrastructure gaps**. The in-person observation further guarantees the feasibility of the bioswale in the proposed area.

Recommendations

Proposed Bioswales

- **Wilshire Blvd:** **Four** proposed bioswales. The proposed bioswales sit within a street verge or planting section. Wilshire Blvd. is one of Westlake's most busiest streets, crossing through a variety of land uses, including MacArthur Park.
- **7th Street:** **Three** proposed bioswales. Due to building density; these bioswales would be place on sidewalks. This street is adjacent to MacArthur Park and experiences high traffic volumes.
- **8th Street:** **Three** proposed bioswales. There were limited locations for bioswale along this street due to encampments and public use. This street intersects with Alvarado Street and cross through variety of land uses
- **Alvarado Street:** **Four** proposed bioswales. The suggested bioswales would be integrated in on-street parking. Alvarado street is considered a main road of Westlake and is adjacent to MacArthur Park.





Wilshire Blvd.



8th Street



Alvarado Street



7th Street