1. Introduction

Litter accumulation and illegal dumping continue to impose significant environmental, economic, and public health burdens on communities. In Virginia, volunteers have collected more than 7.1 million pounds of litter over 36 years, while the state spends approximately $3.5 million annually to clean its roadways (Chesapeake Bay Foundation, 2025; VPM, 2022). More broadly, litter contributes to an estimated 100,000 marine animal deaths each year and is associated with 7–10% decreases in property values in affected areas (Environmental Volunteers, 2023; City of Hampton, n.d.). Tourism also suffers, with some regions experiencing revenue declines of up to 38% due to visible litter and waste (Keep Texas Beautiful, 2024). These impacts demonstrate that litter is not merely an aesthetic nuisance, it is a significant societal problem affecting ecosystems, local economies, and community wellbeing.

Despite these challenges, current reporting and cleanup processes remain inefficient. Citizens often lack a clear mechanism to report litter, leading to delayed or lost notifications when using email or social media. Cleanup organizations struggle to allocate resources effectively due to incomplete or inaccurate location data, while local governments lack reliable analytics to identify high-need areas or justify budget decisions. This reveals a critical communication and coordination gap among citizens, organizations, and municipal agencies.

An effective solution must enable real-time litter reporting, accurate geolocation, verification tools, and cross-stakeholder collaboration. It should simplify reporting for citizens, improve situational awareness for cleanup groups, and equip governments with data-driven insights for planning and resource management.

TrashTag provides this capability. As a mobile platform for photographing, mapping, verifying, and tracking litter, TrashTag delivers real-time visibility, operational efficiency, and actionable analytics. By closing the communication gap and streamlining the cleanup lifecycle, TrashTag offers a scalable, community-driven solution to the societal challenges posed by litter and illegal dumping.

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