

25% of US Manholes Need Urgent Help: The Ultimate Guide to Spray Applied Lining



The numbers don't lie: the EPA has determined that approximately **25% of all manholes** in the United States are suffering from serious decay and require immediate rehabilitation. With over 20 million sanitary sewer manholes across the country, this translates to roughly 5 million structures in urgent need of attention.

For municipalities already stretched thin on infrastructure budgets, this presents a critical challenge. Traditional dig-and-replace methods can cost \$15,000-\$30,000 per manhole, require extensive traffic disruption, and take weeks to complete. The good news? Spray applied lining technology offers a proven, cost-effective alternative that rehabilitates manholes in a fraction of the time at a fraction of the cost.

The Hidden Crisis in Municipal Infrastructure

Manholes represent critical access points in wastewater collection systems, yet their exposed position makes them particularly vulnerable to multiple forms of deterioration. Aggressive sewer gases, groundwater infiltration, freeze-thaw cycles, and chemical attacks from industrial discharge create a perfect storm of destruction.

When manholes fail, the consequences extend far beyond the immediate structure. Infiltration and in-flow (I&I) issues compromise system capacity, forcing treatment plants to process unnecessary water

volume. At approximately \$3.00 per 1,000 gallons of treatment cost, this represents significant ongoing operational expense for municipalities.



Failed manholes also create public safety hazards, environmental compliance risks, and emergency repair situations that can cost exponentially more than planned rehabilitation. The deterioration typically accelerates once it begins, making proactive intervention essential for cost control.

Understanding Spray Applied Lining Technology

Spray applied lining represents a trenchless rehabilitation technology that eliminates excavation requirements while restoring structural integrity to damaged manholes. The process involves applying protective coatings directly to interior surfaces, creating a seamless barrier that prevents further degradation.

Modern spray applied systems utilize advanced polymer technologies, including polyurea hybrids like **OBIC (Organic Barrier Infrastructure Coating)**. These materials cure rapidly, adhere permanently to concrete substrates, and provide superior chemical resistance compared to traditional repair methods.

The technology addresses multiple failure modes simultaneously:

- **Corrosion protection** from hydrogen sulfide and other aggressive gases
- **Structural reinforcement** for cracked or deteriorated concrete
- **Infiltration elimination** through seamless application
- **Chemical resistance** against industrial discharge and environmental exposure

Material Options and Performance Characteristics

Polyurea Hybrid Systems

OBIC and similar polyurea hybrid coatings represent the current standard for manhole rehabilitation. These materials offer exceptional durability, rapid cure times, and superior adhesion properties. The spray application creates a monolithic liner that conforms to existing geometry while providing structural reinforcement.

Key performance advantages include:

- Chemical resistance to acids, bases, and solvents
- Temperature stability from -40°F to 300°F
- Elongation properties that accommodate structural movement
- Abrasion resistance for high-flow applications
- UV stability for exposed applications



Epoxy Systems

Epoxy-based spray applied linings provide excellent chemical resistance and structural properties for moderate rehabilitation applications. While requiring longer cure times than polyurea systems, epoxy materials offer cost-effective solutions for less severe deterioration scenarios.

Cementitious Alternatives

Specialized mortar lining systems offer rapid cure characteristics and dimensional restoration capabilities. These systems work effectively when combined with polymer topcoats for enhanced chemical protection.

The Spray Applied Lining Process

Professional spray applied lining installation follows established protocols to ensure optimal performance and longevity.

Surface Preparation

Successful rehabilitation begins with thorough surface preparation. This includes removal of loose material, cleaning of oil or grease contamination, and profile creation for optimal adhesion. High-pressure water blasting or mechanical preparation creates the necessary surface profile.

Environmental Controls

Confined space entry procedures, ventilation systems, and atmospheric monitoring ensure worker safety during application. Professional contractors maintain comprehensive safety protocols for man-hole rehabilitation work.



Application Process

Spray applied materials are mixed and applied using specialized equipment that ensures proper material ratios and application thickness. The spray process allows complete coverage of complex

geometries, including pipe connections and irregular surfaces that would be difficult to address with other rehabilitation methods.

Quality Control

Professional installations include thickness verification, adhesion testing, and visual inspection to ensure complete coverage and proper cure. Documentation provides municipalities with verification of rehabilitation quality and expected service life.

Advantages Over Traditional Replacement

Spray applied lining offers significant advantages compared to excavation and replacement methods:

Cost Effectiveness

Rehabilitation costs typically range from \$3,000-\$8,000 per manhole compared to \$15,000-\$30,000 for replacement. The cost differential becomes more pronounced when considering traffic control, restoration, and indirect costs associated with excavation.

Minimal Service Disruption

Most spray applied rehabilitation can be completed within 4-6 hours, allowing rapid return to service. This contrasts sharply with excavation projects that may require extended service interruptions and traffic impacts.



Extended Service Life

Quality spray applied linings provide 30+ year service life when properly installed and maintained. This approaches the longevity of new construction while preserving existing infrastructure investment.

Environmental Benefits

Trenchless rehabilitation eliminates excavation waste, reduces carbon footprint associated with material transportation, and preserves surface improvements including pavement and landscaping.

Implementation Considerations for Municipalities

Successful manhole rehabilitation programs require systematic assessment and prioritization. Municipalities should consider:

Condition Assessment

Professional evaluation identifies manholes requiring immediate attention versus those suitable for preventive maintenance. This assessment guides budget allocation and project sequencing.

Material Selection

Specific site conditions, including chemical exposure, structural requirements, and budget constraints, influence optimal material selection. Professional contractors provide material recommendations based on performance requirements.

Contractor Qualifications

Spray applied lining installation requires specialized equipment, materials expertise, and safety protocols. Municipalities should verify contractor experience, equipment capabilities, and safety records before project award.



Long-Term Performance and Maintenance

Properly installed spray applied linings require minimal ongoing maintenance while providing decades of reliable service. Regular inspection protocols should include visual assessment of liner condition, documentation of any changes, and verification that protective properties remain intact.

The investment in professional rehabilitation pays dividends through reduced emergency repairs, improved system reliability, and extended infrastructure service life. For municipalities facing the challenge of widespread manhole deterioration, spray applied lining technology provides a practical, cost-effective solution that addresses immediate needs while supporting long-term infrastructure sustainability.

Professional rehabilitation using advanced materials like OBIC ensures municipalities can address the 25% of manholes requiring urgent attention without the disruption and expense of traditional replacement methods. The technology continues to evolve, with ongoing improvements in materials science and application techniques that further enhance performance and value for municipal infrastructure investment.