

Innovative Odour Management for Urban Waste Logistics

Case Study:

Enhancing odour control during municipal wet waste transportation through customized **Spray Gel Technology**

Abstract

Odour management remains one of the most persistent operational challenges in municipal solid waste transportation systems, particularly when handling biodegradable wet waste. A municipal waste management facility operated by a well-known facility management company in Goa, India, evaluated a customized odour-control programme comprising a Spray Gel technology and a liquid odour neutralizer developed by Amalgam Biotech. The objective was to reduce odour emissions during waste transportation, improve working conditions, and minimize nuisance to surrounding communities.

While routine washing and sanitation practices help maintain cleanliness, they frequently fail to provide sustained odour control. To address these challenges, facility management company initiated a field evaluation of a customized odour management programme incorporating Spray Gel Technology and a liquid odour neutralization solution under actual operating conditions.

OdoServe Gold BI is used after washing the truck to control the Odour at washing area:



Overview of Facility & Facility Provider-

India's leading integrated facility management and environmental services companies, serving government, municipal, industrial, healthcare, and infrastructure sectors. The company provides a wide range of services including waste management, mechanized housekeeping, sanitation, landscaping, and environmental solutions. With operations across multiple states, it manages large-scale municipal solid waste and public sanitation projects. Its focus on innovation, operational excellence, and sustainability has made it a trusted partner for urban infrastructure management.

Through advanced technologies and best management practices, the firm continues to contribute towards cleaner and healthier communities across India.



Introduction

Urban waste management systems generate substantial quantities of biodegradable municipal waste that undergoes rapid microbial decomposition. During collection, loading, transportation, and unloading operations, decomposed products such as ammonia, volatile fatty acids, mercaptans, & sulphur-containing compounds contribute to objectionable odours. In densely populated urban environments, uncontrolled odour emissions often result in public complaints, adverse worker exposure, and negative perceptions of waste management operations.

The facility receives municipal solid waste collected from multiple urban locations within an operational radius of approximately 20 km.

Transportation Operations

Waste Type:	Predominantly wet & biodegradable municipal waste
Vehicle Capacity:	Approximately 9 tonnes per trip
Fleet Size:	Five transportation vehicles
Daily Trips:	2–3 trips per vehicle
Transit Duration:	30–50 minutes per trip

Waste loading is performed using mechanical loaders & JCB equipment before transportation to the centralized processing facility.



Existing Cleaning Practices

The facility follows a structured vehicle hygiene programme:

- Washing after every trip
- Periodic deep cleaning after 2–3 transportation cycles
- Dedicated truck washing station

Despite these measures, persistent odour generation remained a major operational concern.



Operational Challenges

A preliminary site assessment identified several key odour-related issues:

1. Odour Emissions During Transit

Vehicles transporting wet waste generated noticeable odours along transportation corridors extending up to 25 km, affecting nearby communities and road users.

2. Residual Vehicle Odours

Even after routine cleaning, garbage odours persisted within vehicle bodies due to retained organic residues and absorbed malodorous compounds.

3. Worker Exposure

Drivers and waste handling personnel were continuously exposed to unpleasant odours throughout daily operations, reducing workplace comfort.

4. Limited Effectiveness of Conventional Treatments

Existing cleaning chemicals and fragrance-based products provided only temporary masking effects and did not adequately neutralize odour-causing compounds.

Objective of the Study

The study aimed to evaluate the effectiveness of a customized odour-control programme in:

- Reducing odour intensity during transportation
- Minimizing off-site odour dispersion
- Improving vehicle hygiene conditions
- Extending duration of odour suppression
- Assessing suitability for large-scale municipal deployment

Solution :- ODOSERVE SPRAYGEL

Amalgam Biotech – Only Organization in India to have this technology.

Amalgam is an environmental biotechnology company specializing in odour control and wastewater treatment solutions. The company develops scientifically formulated products for controlling odours from municipal waste, sewage, industrial processes, and organic waste handling operations. Its solutions target compounds such as hydrogen sulphide, ammonia, mercaptans, and VOCs through source-level neutralization. With expertise in customized odour management programs, Amalgam Biotech helps industries and municipalities improve environmental conditions and community acceptance.



Methodology – Baseline Assessment

Initial observations were conducted to establish baseline odour conditions. The assessment included:

- Waste characteristics
- Transportation duration
- Vehicle conditions
- Environmental factors
- Key odour-generating locations

Initial Trial

The first field trial involved application of Spray Gel onto wet waste immediately after loading and prior to transportation.

In parallel, the liquid odour neutralizer was applied in truck washing areas to address residual odours after cleaning operations.

Product Optimization

Based on field observations and operator feedback, the formulation and application methodology were customized to suit site-specific requirements.

Optimization focused on:

- Enhanced odour neutralization efficiency
- Improved surface interaction with wet waste
- Extended residual performance
- Optimized dosage and coverage

Validation Trial

A second trial was conducted using the customized formulation under routine operating conditions and observed by facility personnel and operational stakeholders.

Results

Significant Improvement in Odour Reduction

The initial trial demonstrated measurable odour reduction in the range of approximately 60–70%.

Following customization, the second trial achieved estimated odour reduction efficiencies of 90–95%.

This improvement highlights the importance of tailoring odour-control solutions to specific waste characteristics and operational environments.

Reduced Transit Odour Emissions

The customized Spray Gel substantially reduced odour emissions during transportation, resulting in lower nuisance levels along transportation routes.



Extended Performance Duration

Effective odour suppression was maintained for approximately 2–2.5 hours after application.

This duration was sufficient to cover the majority of transportation cycles without requiring additional treatment.

Improved Vehicle Hygiene Environment

Application of the liquid odour neutralizer in truck washing areas assisted in reducing residual odours remaining after routine cleaning procedures.

Operational Compatibility

The odour-control programme was implemented without modifications to existing transportation workflows, demonstrating compatibility with routine municipal operations.

Benefits Observed

Environmental Benefits:

- Reduced off-site odour emissions
- Improved environmental acceptability of transportation activities
- Lower potential for public nuisance complaints



Occupational Benefits:

- Improved working conditions for vehicle operators and waste handlers
- Reduced exposure to objectionable odours



Operational Benefits:

- Enhanced effectiveness of existing vehicle sanitation programmes
- Easy integration into daily operations
- Potential scalability across larger fleets

Community Benefits

- Improved perception of municipal waste transportation activities
- Better alignment with urban sanitation and environmental management goals



Conclusion

The field evaluation conducted at a municipal waste transportation facility demonstrated that a customized odour-control programme utilizing Spray Gel Technology and liquid odour neutralization can significantly improve odour management during wet waste transportation.

The optimized solution increased odour reduction efficiency from approximately 60–70% during initial testing to 90–95% following customization. Effective odour suppression was maintained for up to 2.5 hours, covering typical transportation cycles and reducing odour emissions throughout transit operations.

The study demonstrates that site-specific odour management strategies can provide measurable environmental, operational, and occupational benefits, supporting improved municipal waste handling practices and enhancing community acceptance of waste transportation activities.

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