

Technology is All the Rage



Impacts and benefits of emerging technologies going into transfer stations BY EVAN WILLIAMS

Technology continues to have an impactful and transformative effect on our world. Its reach even extends to the operation of transfer stations. The scope of these impacts cover many critical operations including loading, scaling, environmental compliance, and safety. When conceptualized and implemented properly, these technologies should allow your facility to operate more efficiently, provide a safer work place, and minimize impacts on the environment.

Operational Efficiency

Ensuring transfer stations operate in an efficient manner is critical to maintaining facility capacity as well as keeping operating costs low. To that end, technology offers several approaches that impact different areas of operations.

The first would be the site entry and scaling. Sites typically need a scale house staffed at all times while the facility is in operation. Often times there are two staff members who deal with both in and out bound traffic. One approach, which may help this operation, would be to use a Remote Presence Unit. This unit provides a video screen and microphone with a ticket printer that allows vehicle operators to see and talk with staff and receive their tickets as well. The advantage with this approach is that scale operators can be pooled in one facility

and they would be better able to cover multiple sites from one location.

Scaling operations can also be improved through the use of Radio-Frequency Identification (RFID) tags. When an operator of a transfer station also has a fleet of collection vehicles, they can assign RFID tags to individual vehicles. These will be paired to readers on the scales. This system allows all tagged vehicles to enter the site and scale without requiring interaction with the operator, as the vehicle tare weight is known and they can unload and leave the site faster. This reduces the onsite time needed for collection vehicles and helps keep queuing times shorter.

Technology can help operations through the Connected Yellow Iron. Most manufacturers are starting to integrate connectivity in their vehicles for service monitoring. This has immediate benefits in servicing, as the vehicles can be tracked in real time to anticipate service needs and to minimize or eliminate down time. Monitoring vehicles

in this way allows parts to be ordered prior to failure or schedule routine maintenance when it is actually needed, not purely based on calendar days since the last service. Vehicles are then allowed to operate as efficiently as they are able.

Performance and Efficiency Metrics

Another area for technology-driven improvements via connected vehicles is Performance and Efficiency Metrics. When properly equipped, wheel loaders can be set up to monitor operator efficiency based on tons per hour, cycles per hour, or even tons loaded per gallon of fuel.

- Taken on a small-scale view, this can help understanding of how the equipment is being used and to look for areas of improvement.
- Taken at a large scale, when a number of facilities have connected yellow iron tracking, all the operators' opportunities emerge to allow the operators to be provided feedback of their performance against the entire company fleet of operators.

Measuring these performance metrics allows under-performing operators to be offered additional training to help them improve. This targets improvements to the areas of lowest performance, where the greatest improvement can be seen. The same metrics can be used to track progress toward improvement.



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Scales and scale house at a transfer station

Environmental Compliance

Transfer Stations have a critical role in the safe, efficient consolidation and shipping of MSW to landfills. Minimizing transfer stations impact on the environment is a critical area where technology can offer improvements.

Odors are a reality of the materials received in a transfer station, and their transmission outside the facility can have a very real impact on neighbors. With modern Odor Modeling Technology, the facility and surrounding area can be fully modeled to provide a realistic scenario for how odors will behave. The model will need to take into account the building and all openings, as well as the surrounding topography, nearby buildings, trees, weather patterns, etc., that will allow the design team to understand how the odors will actually respond to realistic conditions. Implementing this technology before design of the facility begins will then allow the team to include odor control system that will actually address fugitive odors.



ACE Solid Waste Transfer Station

Loader moving trash inside transfer station

Another area of environmental concern for transfer facilities is the control of Leachate. The best practice for facilities is to have a connection to a municipal sanitary sewer that will receive the leachate generated from

the tipping and receiving pits of the transfer station. A common issue that will need to be addressed is that the utility will occasionally sample the outflowing material and it may be in non-compliance due to high pH,



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Backhoe loader at Transfer Station

temperature, oils, or other components. This has typically been difficult to address since many of these vary greatly depending on the material being received at the transfer station on a specific day or other variables, but there was not a good way to present a more accurate picture of the outfall.

Safety

Safety is a critical concern and area for improvement for transfer stations. There are several approaches where technology can improve the safety of the workplace.

Fire is a constant risk for transfer stations and an area where improved technologies are needed. Current sprinkler designs have difficulty dealing with the unique challenges posed by the high-piled combustibles of

put out fires before they get to a point where they are out of control.

Another area for safety improvements is in the area of personnel protection. Areas where heavy equipment and pedestrians both operate is a safety risk, and that is common on a transfer stations tipping floor. Yellow iron, from several manufacturers, can now be equipped with Presence Sensing Technology that will alert operators to obstructions. This will help minimize structural strikes to the building as well as help the yellow iron avoid hitting unloading route trucks. A related but separate technology available from vehicle manufacturers, identifies and warns operators to people nearby. That is a critical area for improved performance, as tipping floor safety is chronically an area needing improvement. These systems, when coupled with on-board cameras can significantly improve the yellow iron operator's situational awareness to work as safely as possible. **MSW**

Transfer Stations have a critical role in the safe shipping of MSW to landfills.

variable characteristics typical of most transfer stations. Having a sprinkler system is not a 100% guarantee to eliminate the possibility of a fire and several areas in the country are sufficiently remote to make supplying a sprinkler system difficult. The Fire Rover System (www.firerover.com) provides a real-time thermal imaging system than scans the facility for hotspots. When certain thresholds are met, they alert human operators that will confirm the risk and activate an articulated suppression stream. This approach seeks to

Evan Williams is a Design Manager for Cambridge Companies (Griffith, IN), a design-build firm working with the waste industry for more than 20 years. During this time, more than 100 solid waste design-build projects have been completed including new build, repairs, upgrades, and modifications at transfer stations, recycling centers/MRFs, hauling companies, landfill facilities, office buildings, and more. Cambridge continually monitors the industry to determine any new needs, changes, or improvements that will benefit their clients and improve their design-build solutions. Evan can be reached at (219) 972-1155, via e-mail at EvanWilliams@CambridgeCoInc.com or visit www.CambridgeCoInc.com.