Manufacturers Update on 2025 Sweeper Testing

by Ranger Kidwell-Ross

Click on the image below to view the Zoomcast Roger Sutherland and I did for the U.S. street sweeper manufacturing community. Should you prefer to not view that and, instead, to read the transcription below, then proceed to further down the page.

To open the Zoomcast click on the image below:

Also, if you wish to see the sweeping-related experience of both Roger and myself, here are the respective links to that information:

www.worldsweeper.com/pdf/RogerSutherlandVita2025.pdf

www.worldsweeper.com/pdf/RangerSweeperVita2025.pdf

Note: *During the portion of the Zoomcast Roger Sutherland presented we screen-shared the pages of his presentation. If you choose to read the following transcription, rather than watching the Zoomcast itself, we recommend that you download his presentation in PDF format so you can follow along. I have annotated in the text below which slide to view when he is speaking in the transcription. Click here to access the slideshow as a PDF.*

Zoomcast Presentation Transcription

This is Ranger Kidwell-Ross, World Sweeper's editor and World Sweeping Association's director. I have over 30 years of experience working with the power sweeping industry. Joining me is Roger Sutherland. Roger, who is a principal with Cascade Water Resources, has over 40 years of designing and conducting tests for street sweepers. He and I will be designing the upcoming sweeper test scheduled to start the second week of July in Southern California. We're not sure of the exact location yet.

I have spoken extensively with management personnel at the South Coast Air Quality Management District (AQMD). Our goal is to get them to both weigh in on this and commit to changing their Rule 1186. That's the test that took place 25 years ago, and where all of the sweepers that tested gained a passing score. At one point, they estimated it would cost about $100,000 to replicate that test through an independent testing agency. However, they could not provide me with an independent testing agency they would certify for this purpose.

So, we're taking a completely different approach. The test we're planning now has been spurred by the Sea Grant/NOAA microplastics study currently underway in Southern California. We believe we can reduce costs significantly to a maximum of $5,000 per test per sweeper. This makes it affordable and enables us to lead the charge in demonstrating what power sweepers can accomplish now in 2025.

AQMD has been presented with three options:

1. First, we're asking them to finance part of this project—we requested $50,000—and also provide air quality monitors that they would certify and operate themselves, covering the associated cost for that too.
2. If they cannot provide funding, we're asking them at least to handle the air quality testing while we manage the runoff analysis and determine what's left on the ground.

3. At a minimum, we've requested that they specify the air quality monitoring equipment they're willing to approve; we will rent it, deploy it, and provide them with the collected data.

In any of those scenarios, we are requesting that this data be used either as a replacement or as an addendum to Rule 1186 regarding which sweepers are authorized in Southern California and other states following AQMD guidelines.

We also have a plan for materials and testing procedures in the upcoming sweeper tests, which are scheduled to start on July 14th of this year. I'll turn this over to Roger so he can discuss what we anticipate for these tests.

Roger Sutherland:
We've put together a brief presentation outlining our current thoughts on this project. For those unfamiliar with my background, (slide page #2) this will be my tenth paid project organizing street sweeper testing at various levels of complexity. The last major test was also conducted in Southern California—the same region where our upcoming tests will occur—and indeed one of our two potential sites is where we conducted previous tests.

(slide page #3) The site selection is crucial for realistic testing conditions. We plan on creating a test track that's 50 feet long by two feet wide, similar to previous tests like the Elgin test conducted back in '08. We're aiming for either asphalt or concrete pavement—one site has concrete, another asphalt; we'll determine which one we'll use later.

Both potential locations offer at least approximately 1,000 feet of curb space and fair-to-good pavement conditions. Notably, both facilities under consideration are water reclamation plants without public access, ensuring a safe environment free from traffic concerns.

(slide pages #4 and #5) We'll create realistic test conditions using simulants—a mixture representing typical street debris composed of six manufactured products blended according to a specific recipe we've refined through past testing experiences. Additionally, we're considering including microplastics in our simulant mixture due to their prevalence in street dirt—particularly tire-derived microplastics—though final decisions depend on collaboration with our project partners.

Ranger Kidwell-Ross:
We're also considering incorporating a trash component into our tests due to ongoing trash initiatives in Southern California. We're seeking manufacturer

input regarding realistic trash items commonly encountered during sweeping operations—such as litter bottles or similar debris—to ensure practical relevance without including overly large items like tires or mufflers that exceed sweeper capabilities.

Roger Sutherland:
Exactly—we'll collaborate closely with our trash initiative partners to ensure realistic representation of trash items commonly encountered during sweeping operations.

(slide page #6) Regarding procedures, we'll spread a known quantity of simulant evenly using a fertilizer spreader along our designated track area. Each sweeper will make a single pass at specified forward speeds—five miles per hour and ten miles per hour—to assess performance differences clearly since speed significantly impacts effectiveness.

This year marks our first comprehensive water use during testing—previously tested only once experimentally back in Illinois (2008). Water usage generally reduces pickup effectiveness by approximately 20%, but it's universally employed for dust suppression—an important trade-off we'll document clearly.

Ranger Kidwell-Ross:
We also plan on measuring noise levels emitted by each sweeper using decibel meters during operation—another valuable data point manufacturers can leverage.

Roger Sutherland:
(slide page #7) Correct—and regarding forward speeds during testing—we'll evaluate sweepers at both five miles per hour (mph) and ten mph speeds. These speeds represent realistic operational scenarios commonly encountered in street sweeping practices; slower speeds typically yield higher pickup efficiency, while faster speeds allow greater coverage but reduced effectiveness—a crucial performance trade-off we'll quantify precisely using stopwatch timing during each run.

(slide page #8) After each sweeper pass, we'll vacuum the remaining material thoroughly using stainless steel drum shop vacuums designed for easy removal into zip-lock bags or jars suitable for microplastic analysis—a meticulous but essential step to ensure accurate data collection.

(End of slideshow except for final page with our contact info.)

Ranger Kidwell-Ross:
Regarding costs—at the moment we are confident total expenses won't exceed $5,000 per sweeper tested under these conditions—a significant improvement compared to previous AQMD tests costing around $100K each due primarily to their water-flushing method requiring extensive water collection afterward. Factors still in flux are the cost of analyzing the microplastics and what, if any, assistance we receive from AQMD.

Roger Sutherland:
I just wanted to say that there's a lot of moving parts. I know this test will be significantly lower in cost, primarily because we're working in the dry form. Whereas with the AQMD tests that were done over 25 years ago, after they passed a sweeper over their test material they flushed the track. That means they had to collect every single drop of water; then, they had to spend quite a bit of time filtering the sediment out of that water.

We're staying dry, but we are interested in fugitive dust and decibel output. I've mentioned the unknowns. The microplastic analysis is unknown. I'm hopeful that it's not going to be a significant cost. Everyone will want to test with that anyway because that's going to be a big issue, and we know in Southern California it already is.

Also, the time it takes to mix new simulants affects how many passes are made. To give you an idea, the assumptions we've made so far is that if this is just one week of testing, I've assumed that to be just 12 passes, i.e., 6 sweepers. However, if we can get the simulant mixed by our associates at the University of Southern California and the City of Santa Barbara in their soil lab prior to our arrival, we'll be able to get in a couple more passes—we should be able to run 14 total passes instead of 12 in that week, i.e., 7 sweepers.

If we go two weeks, we've got 24 passes. And if we go three weeks, we've got 42 passes. Those are assuming a certain timeframe based on the critical path of it having to dry the track before we vacuum it.

But we're already exploring having two test tracks of 50-foot length within 1,000 curb feet. And we would say all the five-mile-per-hour tests will be at this one; all of the ten-mile-per-hour tests will be at that one. That way, we could constantly vacuum and let drying occur.

It's going to be interesting how that plays out. But these will affect our cost estimate. Our plan is to share the actual costs with everyone who participates.

As Ranger said, we've asked for $50,000 from AQMD. If we get $50,000 from the agency, it will tremendously reduce the amount we might have to charge the manufacturers to make up the difference.

In any case, those are the kinds of things that will affect costs. As soon as we have better numbers, we'll share those with you, and you will know what it is before we have to test. We should have AQMD's answer in the next 30-60 days; everything in terms of simulant will be done, and the site will be selected.

And we're pretty excited about the opportunity to do this. As for the information you will get back, you will see your pickup performance by particle size and what kind of microplastic performance you achieved. They will provide an analysis indicating "you picked up XX% of the microplastics that were out there," as well as information on your sweeper's pickup of the various sizes of the rest of the simulant.

Keep in mind that microplastics don't have any real weight. Therefore, we hypothesize that any street sweeper will be very effective in picking up microplastics.

But because we will have all of this information by particle size, in addition to dust output and the decibel level of the sweeper, stormwater, and other managers all over the country will be able to convert that into an understanding of how much additional pollution is associated with these various particle sizes—and we're talking pretty fine stuff.

That concluded the Zoomcast presentation. We have asked all of the street sweeper manufacturers that we involved in this — which included all manufacturers that sell street-class sweepers in the U.S. marketplace — to contact Ranger by April 30th at the latest, via email sent to ranger@worldsweeper.com, with information about the specific models they intend to test. As said in the presentation the cost for testing each model is currently projected to be in the area of $5,000.

We also invite any members of the street sweeper purchasing marketplace to provide comments to Ranger, as well.

For More Information

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