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# Benefits of street sweeping

**Bucher Municipal**  
Matthew Starnes

**World Sweepers**  
Ranger Kidwell-Ross

## **Learn the advantages of power sweeping to combat pollutants**

### **Matt Starnes, Host:**

Hey, it's Matt Starnes, your host of the Sweepers and Tankers Podcast. Want to let you know, this is the second time we've done a video version of the podcast, and go ahead and listen to it. There will be some references to some slides, which our guest explains thoroughly, I think, in the podcast. But you can gain a little bit more, too, if you go over to the YouTube channel, if you're a visual person, and see those slides for yourself that we go through.

The guest is someone I've been trying to get on the show for about a year, Ranger Kidwell-Ross, who is of Worldsweeper.com. And he's got on tap for us, the latest documented proof showing street sweeping to be nearly seven times more cost-effective than the next best method, such as catch basin systems for removing nitrogen and phosphorus from the pavement runoff stream. Really good information here. This one's a little bit longer than we typically do, it's about half an hour. So we hope you listen to it in your car, at home, or over the weekend in your garage as you're tinkering around. Or again, if you're a visual person, head over to the Bucher Municipal North America YouTube channel and you can see all of it in its glory.

### **Announcer**

Welcome to The Sweepers and Tankers Podcast. This podcast covers topics on the street sweeper and sewer cleaning equipment market. Now, let's welcome our host, Matt Starnes.

### **Matt Starnes, Host**

All right. We've got a very special episode of The Sweepers and Tankers podcast. I've been trying to line us up here with a Ranger Kidwell-Ross, of worldsweeper.com. What's it been? Probably a year. We've been talking about doing a video, a podcast structure.

### **Ranger Kidwell-Ross**

We have talked back and forth.

## **Matt Starnes**

We did some audio stuff and a couple of videos at some shows, but definitely excited to have you heavy on the podcast. Could you give us, in a nutshell, what you do? I know, but I think a lot of people, for some reason, if they don't know, they should know.

## **Ranger Kidwell-Ross**

Yeah. Glad to do that. I caught on early on over 30 years ago, the fact that public works directors still thought they were cleaning up horse poop instead of brake linings and clutch plate linings and that kind of thing. So I knew that people were saying water will be the next scarcity, and now it has come to pass. Certainly. And that sweeping was the first line of defense as that opening screens stage for water quality. And I've been preaching that ever since.

## **Ranger Kidwell-Ross**

I started in '87. I did a newsletter for the Schwartz family back when they owned Schwartz Industries and then founded American Sweeper Magazine to push the information out to the public works community about the value of sweeping and storing water, in the nineties. And for the last 15 years, going on 16 I have had the largest website for power sweeping on the planet, [worldsweeper.com](http://worldsweeper.com), and we're starting our ninth year as the World Sweeping Association. We have over a hundred contractors that are involved in education, primarily. I send them an email every couple of weeks that keep them up with the latest in the sweeping arena and things they can use. That's basically it.

## **Matt Starnes**

So nothing has changed at all since you've started (Laughter).

## **Ranger Kidwell-Ross**

It's pretty much the same.

## **Matt Starnes**

I'm so thrilled to see you, just because we used to run into each other in these shows, but of course, with these COVID times have become virtual, if any, at all. So it's good to get to see you there. I really wanted to get your expertise. You've really done the best job as far as making, a complex series of reports that Florida did about stormwater runoff and making it so with the aid of the transcripts, so I could actually understand it. So I wanted to try to capture some of that magic on a video presentation here.

## **Ranger Kidwell-Ross**

I couldn't understand the study either. I read it a couple of three times, but even interviewing the principal investigator from the University of Florida, Dr. Johnson, I was able to really suss out what's going on with it. And it's interesting. I put together some slides that I think would be helpful for those who aren't as familiar with the problem as, as you and I are. And so let me share a screen here.

## **Matt Starnes**

Absolutely.

## **Ranger Kidwell-Ross**

We've already seen that and we don't need to see it anymore. People don't even know what stormwater pollution is or what the real problem is. And just as a quick definition, anytime rain falls down and goes on the pavement, it can't leach into the grass or the ground, which is the best way of getting rid of pollutants. But when it hits these impervious surfaces like rooftop, sidewalks, roads, the pollutants that are contained there, and the two biggies are nitrogen and phosphorous, they go into the water. And especially if you have a combined sewer where your sewage system effluent and your rainwater go out at the same time, it can really be a problem. And primarily as it says, from fertilizers and yard waste and pet waste is where that's coming from. And it is very serious we now have over 166 dead zones, that have been documented around the US, not in the world.

## **Ranger Kidwell-Ross**

Places like the Chesapeake Bay and the great lakes and many others. The Gulf of Mexico has the largest. So it's a problem that is there and it's doing nothing but getting larger. Fortunately sweeping, which is really underrated and reported by, even the majority of the public works community, is by far the best way and least expensive way to get that out of our water system, and I'll show you some of that.

## **Matt Starnes**

Great.

## **Ranger Kidwell-Ross**

There's a sweeper you know well, Bucher Machine. And what we've learned is that they have really, especially the last decade, vastly improved the pickup efficiency of particles of all sizes. And interestingly to me, particles under 250 microns are available. And to give you an idea of what 250 microns is, a human hair is about 72 microns. And three times that, plus a little bit is 250 microns. It turns out that only about 10% of the material on the city street might be of that 250-micron size because that's because it's very small,

## **Ranger Kidwell-Ross**

However, up to 60% of the pollutant load, for reasons of physics, might be in that small fraction and the smaller materials. And if you think about it, if you take a little piece of dirt and add water to it, it's going to get soluble. If you take a rock and add water to it, nothing happens. So that's just one of those things that we know now that sweepers can pick up lots more of those small materials than before. And one of the difficulties to public works directors and the general public is to convince them that, of all that material out there on the street and the rocks and the cardboard boxes and the mufflers and the dead caps and whatever, what we need to get are these materials that are three times the width of our hair and smaller.

## **Ranger Kidwell-Ross**

And they found even that's why, regenerative air and vacuum sweepers have really come to the fore because we know that with a general broom sweeper if you're really trying to get those particles up without air added, they can have bigger particles become smaller particles. And even though the ground behind the sweeper might look clean to the untrained eye, they're going to have a lot of those small particles. And if you think about it, those are the ones that when there's a storm, they'll wash off easier. If there's wind, they'll go up into the air easier. We have about 100,000 people a year that ended up with asthma as a result of air quality, and a lot of it is from those particles coming up into the air.

## **Matt Starnes**

You've been around machines enough, I think our viewers and listeners haven't been around a lot of these sweepers and there is a big difference. The mechanical sweeper has a certain purpose, certain applications where it works really well and helps out. But these like, V65 vacuum sweeper and R65 regenerative air. It's just amazing how much more they pick up and are able to capture. But any of those machines, yet it is something because it's a little bit deceptive, isn't it Ranger? That you say 10% are these fine, particular matter, but it's a big problem if it gets in the, in the stormwater system and runoff.

## **Ranger Kidwell-Ross**

It really is Matt. One of the things that cities can tend to do is, especially the ones up in the snow belt, will have a significant spring cleanup problem that they need broom sweepers for. In their applications, you really need broom sweepers. Construction, milling, spring cleanup. And when you have all that sand and cinders that are down on the roadway and so forth. But then, because they have to have those for oftentimes, two weeks or a month until they get all of that winter detritus clean up because sweepers are expensive and they don't understand the overall value that they provide in terms of stormwater abatement. If they go to an air sweeper and how much more value that has, they tend to just keep using their brooms sweepers. And it's just not good for the environment. That's, that's all there was to it.

## **Ranger Kidwell-Ross**

I'll take you a little further down the rabbit hole here. Here's Seattle, that's an area that, everybody understands Seattle and where it is and it rains all the time people say, and so forth. So they looked into... In 2011, they did a sweeping, as it says, as an adjunct to their other end of the pipe solutions, what should be catch basins and grassy swales and all manner of things. And over a two year period, they increased the amount of pollutants that they removed from their stormwater prior to the end of the pipe, over 300%. So they doubled their budget for sweeping. I don't know why they didn't triple it, but they double it. I guess that's all we could ask for.

## **Matt Starnes**

To start right?

## **Ranger Kidwell-Ross**

To start with. Certainly so. And then this major study that I wanted to bring out. I started in 2011, started on campus primarily from 2011. And we got some final results in 2019. Unfortunately, this did not separate out which of these 14 municipalities were using an air sweeper and which were using a broom sweeper. But what happened was that the Florida stormwater association and the state of Florida commissioned a study, run through the University of Florida by a guy named John Sansalone. And they found during this study that involved all of these different Ms for which is to say municipalities, that sweeping was found to be seven times, nearly seven times more cost-effective than any of the other best management practices that were there for the two big pollution parts that we want to get rid of, which is total nitrogen and total phosphorus.

## **Ranger Kidwell-Ross**

And what they did was they measured the amount of material that was picked up by all of the BMPs that they had for cleaning their stormwater. Including sweeping, but then Catch Basin Cleaning. And there are many ends of the pipe measures from, cleaning out catch basins with infiltrations and grassy swales, and a variety of things. And the nice thing about sweeping is that you don't have to go and take some property and build infrastructure like you do with a settling pond or a grassy swale and so forth.

## **Matt Starnes**

Yeah, it's a good point.

## **Ranger Kidwell-Ross**

What they were after, is to figure out what the cost of capturing a pound of nitrogen and a pound of phosphorus would be for each of their best management practices that they were putting into place in Florida. And look at what they learned. The relative cost of removing total nitrogen was \$189 a pound with a sweeper and with a catch basin, which was the next best. It was over \$1,100 per pound.

## **Matt Starnes**

Per pound, wow.

## **Ranger Kidwell-Ross**

And then for the rest of the other, filtration ideas and generalized ways that they deal at the end of the pipe, they were looking at over \$2,000, a pound.

## **Matt Starnes**

Unbelievable.

## **Ranger Kidwell-Ross**

And again, they combined their broom and air sweeper performance. So with an air sweeper, you would expect the data to be better, but this is your nitrogen. Check this out for phosphorus \$294 a pound you think, "gee, that's pretty expensive for taking a pound of phosphorous off, off the street before it gets into our water." But look a catch basin is almost \$900 for a pound and \$12,000 a pound.

## **Matt Starnes**

I just cannot believe it, and I've looked at the study numerous times and I still have that same reaction where it is like, "Oh my gosh." You wouldn't think, there'd be so much a difference in the way you approach it, but there really is. There certainly is.

## **Ranger Kidwell-Ross**

There really is. And for that reason, one of the things that I do is, I encourage public works directors to combine their sweeping program with their general public works and stormwater abatement program. And the reason to do that is, I did some seminars in Northern California and Southern California for stormwater professionals. And we started out and we gave them a question there. And then we finished up, we gave them a questionnaire. To start with, we said, "well, what are you doing for stormwater?" "Oh, they're doing all these things because you're now able to collect money through garbage collection fees, primarily from homeowners. And then that money goes to abate pollution in stormwater runoff." And they have a pretty good budget for that. And boy, they're doing this and they're doing that.



## **Ranger Kidwell-Ross**

And then you say, "what are you doing for sweeping?" And they said, "well, sweeping is pretty expensive all the time and we have to park them, and with whatever budget we can get." By the end of our seminar, they understood what we were talking about. And it was generally agreed that the best thing to do is to combine your stormwater department with your sweeping department now, you've combined budget. To do the rudimentary studies that are needed to know how much material you're picking up that's a pollutant. And with was some testing, you can do that. And I won't get into the weeds on that, but it's certainly available to do. Obviously if you... Obviously but I'll say it anyway if we sweep once a year, you're going to pick up a lot of material per block, per mile. If you sweep every day, it's going to be pretty negligible.

## **Ranger Kidwell-Ross**

So somewhere in the middle is..., So the cost of sweeping every day, the cost of picking up a pound of pollutant is sky-high. And then if you sweep once a year, then you're going to pick up so much material, per mile that the cost per pound of pollutant goes way down. Figure out, and this is possible to do mathematically, figure out what the best sweeping frequency is. And don't be surprised if it's two or three times what you're doing now, stays cost-effective for removing the pollutants and your general public will be a lot happier to see the results of the clean streets and so forth as well. But when the cost of the final pound of pollutant, you pick up with a sweeper because you've increased your frequency of sweeping, equals the cost of the first pound of pollutant, you might pick up at a catch basin, for example, then put more in salt... That's where you stop sweeping at that frequency.

## **Ranger Kidwell-Ross**

And you put the rest of your budget into the cash phase, or the grassy soils or whatever you need at that point. I hope that that makes sense.

## **Matt Starnes**

I think it does, hopefully, that'll... I think that should resonate with people and one thing with, I don't want to just tout, our equipment here, with our vacuum sweeper, we do have that option. Some of our competitors too, have the wander hose or the power boom. So if you're just starting your sweeping program, you actually have that ability to clean a catch basin out and see, "wow, this is how overworked this poor catch basin is," which usually is the case when it hasn't been cleaned properly. And then you start the sweeping. So you can get a two for one a little bit and approach it that way.

## **Matt Starnes**

And then we're seeing too, we also produce a water recycler sewer trucks, and that's very important too. Not only to recycle the water but to keep a sewer from overflowing and getting into our freshwater. It's quite critical. So I think you're right. The more you can combine and have an almost a holistic spread approach to tackle these problems. I think that's a real value for municipalities.

## **Ranger Kidwell-Ross**

Absolutely. That's very good information for you to bring up because why wouldn't you for the very small, additional investment have a wander hose. And what he's talking about is a large... What's the size of a typical one? Say on your V65, how big is that? Is that 10 inches or something like that?

## **Matt Starnes**

Eight inches. When you think about that, it doesn't seem... That's not very large, but boy it can suck. We have video of it on our site and YouTube channels. You can suck up a brick with the power you have with a vacuum sweeper.

## **Ranger Kidwell-Ross**

No, get your small children, or that need to have that capability, then you have with your sweepers multi-use vehicles and that's very important.

## **Matt Starnes**

Yeah, absolutely.

## **Ranger Kidwell-Ross**

I'll show you the next slide here. This is just some words about this Florida pickup practice. They found absolutely the most economical and dominant practice that an MS4 or I still need to say, could implement in order to maximize the amount of nitrogen and phosphorous that they pick up is sweeping. However, we haven't talked about the other one here PM. Which is just particulate matter. So that really matters as well. So with any of your other methods more toward the end of the pipe, you have all this particulate matter that's still left on your streets. And we haven't even talked about the value of that.

## **Ranger Kidwell-Ross**

So if it's nearly seven times more cost-effective for a good quality, especially airbase Street sweeper, to pick up the nitrogen and the phosphorus and get it out of your system, then add to that, the fact that you're picking up all of this PM or general particulate matter, which is to say, gravel and rocks and the cardboard boxes and so forth. And by the way, this study was so large that there's a 95% confidence level when you can combine all these 14 municipalities' results. That's very high. So that basically covers that information that we wanted to bring to you. I'll come back.

## **Matt Starnes**

I really appreciate that Ranger. It's really great information. And I think, the transcripts and your articles on your website where you have the interview are very helpful as well for a deeper understanding. Definitely helped me make sense of the report, as we mentioned earlier. And then I hope this will at least be a nice overview for people that can pique their interest and hopefully explore a little bit further and learn exactly how street sweeping can help this very serious matter.

## **Matt Starnes**

I just read an article this morning. NASA is getting in and analyzing freshwater sources from space. They're basically analyzing from that too, and how everything affects. It is just a huge... It's real. It's very real. You can see the kind of effort worldwide that we're now putting into this, and I appreciate you bringing this to our attention and hopefully getting people to explore this a little bit further. So to that end, they should go to [worldsweeper.com](http://worldsweeper.com) for the knowledge. And they can go to [buchermunicipal.com](http://buchermunicipal.com) to get the beautiful products.

## **Ranger Kidwell-Ross**

That's right. And let me talk about something that is easier for me to talk about than it is for you perhaps. The people involved that are, let's say Bucher dealers, they're going to be generally familiar with this kind of stuff. And they know where to go if they have questions. And one of the things that municipality, should really count on, is companies such as yourself that have a variety of types of sweepers. That means they can get the right sweeper for the right job. And, they're not just being sold, what you happen to have. There's variety, there are options, and so forth that are available. Not only options on a sweeper, but different types of sweeping machines. And that's very critical that you get the right machines for the right job. Use that the right frequency at the right speed, with the right repair parts, put on them, and kept up to shape. That's the kind of thing that just makes all the difference.

## **Matt Starnes**

Thank you. I'm glad you brought that up and we do have, when you go to our home page, we do have educational free, we're not trying to sell you. It's an offer, a free report that we have available for you. "Five things you must know before purchasing a Streetsweeper." We actually have one for the sewer tanker side of it as well. And this is completely a free report and addresses exactly what you're talking about, where we're not trying to sell you anything. I think I actually have like the slide you showed. I don't have any branding on the vehicles that we show. We're just trying to help you. The reason this all came about is there was, I won't mention the city, they were sold several street sweepers, and they were too large to fit down the streets. They needed to sweep.

## **Matt Starnes**

So you're talking millions and wasted. Nobody wants that for this industry. You know this it's very small... It seems like the United States is very large. Yes, but all these municipalities, we all speak to each other. It's a very small world. The sweeping world actually, when you... It's almost like Kevin Bacon, The Degrees of Separation. You can touch everybody.

## **Matt Starnes**

That's where this report stemmed from. Even if you don't buy the sweeper from us, of course, we'd love for you to buy our equipment, but we don't want you making that type of investment mistake, especially at that level. But even if it's one sweeper and you're a small town, you can't afford to make that mistake. You have to have the right equipment for the right application. You just have to. Take us up on that free report. We send you a one reply email and we send you the report. We don't hound you to death. It's just one of those things that, we can't have that happen in our industry. It'll take us all down if those kinds of mistakes are made so

## **Ranger Kidwell-Ross**

And none of the manufacturers want that to happen.

## **Matt Starnes**

No.

## **Ranger Kidwell-Ross**

It's not good for the industry, is not good for them. And it's terrible publicity. I recall reporting on the story you're talking about. And it was terrible publicity for the city, as well as... And there's no way for the sweeper manufacturer to know that the size of their streets... That's one of those things that you can argue they should have known, maybe their dealers should have picked that up, but not necessarily.

## **Ranger Kidwell-Ross**

And keep in mind that, if you have bike lanes, which a lot of cities are coming with now, you might need a dedicated sweeper for your bike lanes or running tracks, and those kinds of things, or for your downtown core may need different machines. There are even machines out there you can drive on the street and then up on the sidewalk, and then back down on the street. Look around to get what you need but Bucher certainly is one of the forefront companies. I think you are the biggest sweeper company in the world. I don't know if that's the case in North America yet, but you just got here a decade ago or so.

## **Ranger Kidwell-Ross**

Look around for the choices that are out there and get advice. You can contact me at world sweeper if you want. I'll put up the last slide at the end, and it has my contact information. Be glad to help you. I'm not tied in with any particular manufacturers. And I know everybody in the industry by far after 30 years.

## **Matt Starnes**

Absolutely.

## **Ranger Kidwell-Ross**

I'm probably supported by pretty much the industry. And I'll give out information that... Typically the types of sweepers and leave the brand up to the person calling.

## **Matt Starnes**

Absolutely. Again, if you have not checked out Ranger's website, please do so. It was a huge help when I was new to the industry, just the website by itself. And then as I met ranger at the different trade shows and things of this nature, it... Like he's saying, he's there for you to answer questions about this industry. This is something he's passionate about, and I get pretty excited. We have some good conversations, but he really has some good insights. He's very passionate about this and he's been doing it a few years. So he knows a thing or two.

## **Ranger Kidwell-Ross**

That's great. This has been nothing but fun. And let's see, do I need to... Is that still showing the screen or can I get rid of that? There we go. This is nothing but fun, and I knew it would be. We have talked about having another podcast that is, "The ways to minimize the cost of your sweeping program and increase the value," so you could look to that another day.

## **Matt Starnes**

I think that's ripe for... We can talk about that a pretty good length I believe. I'm looking forward to that as well.

## **Ranger Kidwell-Ross**

[You can do now, but we'll wait till everybody memorizes completely what we've just told them and then come back.

## **Matt Starnes**

That's right. Send book reports too.

## **Ranger Kidwell-Ross**

There will be a quiz.

## **Matt Starnes**

Thank you again, Ranger. I really appreciate it. Why don't you go ahead and tell folks where they can find you again. I know I've mentioned both of us a couple of times, but it's always good.

## **Ranger Kidwell-Ross**

If you want more contractor information about the world sweeping association by going to our website, which is [worldsweepingpros](http://worldsweepingpros.com), P R O S not OSE .org. You can also find a redirected at [sweeperclub.org](http://sweeperclub.org). And then the Earth's Largest Power Sweeping Resource is [worldsweeper.com](http://worldsweeper.com). We have an astonishing amount of information there. I looked it up at the end of this last year, and we had 55,000 plus photos and files having to do with sweeping. Believe it. It's just amazing to me what you can put together in 15, 16 years of collection.

## **Matt Starnes**

I do like too, that you put, Earth instead of planet, you put Earth's largest because we'll be doing this on Mars, dust suppression. We're going for it, right?

## **Ranger Kidwell-Ross**

Water is a precious commodity here. You are not going to get rid of that. They'll probably be looking for nitrogen and phosphorus there, we can stay alive with. You do a great job for your segment of the industry, Matt, and I want to give you some kudos as well. You're working hard to bring out very valuable information to both sides, both of the industry segments that you cover. So good on you for doing that and for the Bucher crew to realize how important education is.

## **Matt Starnes**

Thank you so much. Appreciate it. And yeah, we're looking forward to our next conversation.

## **Ranger Kidwell-Ross**

All right. See, everybody then.

## **Matt Starnes, Host**

Thank you so much.

## **Announcer**

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