



Improving work processes with machine control

Machine control is a powerful technology that can help contractors improve productivity, reduce errors and rework, cut costs, and recruit and train the next generation of operators. However, the technology is complex, and implementing it is not as simple as flipping a switch. The key is aligning its strengths with the company's project portfolio. In this edition of Experts Corner, SMS Equipment's Manager of Smart Construction Kris Troppmann explains how leading contractors achieve this.



Did You Know? Proactive dozing allows the operator to work with automation in all job phases, from the first pass to the last pass. Existing ground conditions at the tracks are continually collected, and with every pass, the new ground condition updates to follow existing grade contours similar to an experienced operator.

Q: What problems do your customers say they want to solve with machine control?

A: The most frequent concern I hear about is that there's a labour shortage. The most experienced baby boomers are retiring, and it's extremely difficult to attract the younger generation into the marketplace. So machine control fills that gap twofold. Number one, by ensuring a minimum level of acceptable production on projects, even with relatively inexperienced operators. And number two, by attracting the younger generation with the use of modern technology into an industry that is challenged in terms of its image.

Q: How does machine control ensure production standards?

A: There are several ways this happens. First of all, these systems can handle a lot more data than a human being can. If you're roughing in a road for a subdivision without machine control, for example, your operator will be reading a large number of sticks from surveyors and trying to make sense out of them. That creates the opportunity for error, especially for inexperienced operators. So machine control handles all that information digitally and reduces that risk.

Furthermore, Operators using machine control can also work faster with fewer mistakes, so the long-term cost savings are significant.

Machine control also maintains a record of all activity, proving beneficial to quality control, training, and work process improvement. It also allows contractors to create as-built models, which can be provided to customers as a value-add.



Cab top GNSS antenna allows for accurate as-built surface data collection by measuring actual elevations as machine continuously tracks in operation. This means you can measure progress in real-time with operator selectable settings.

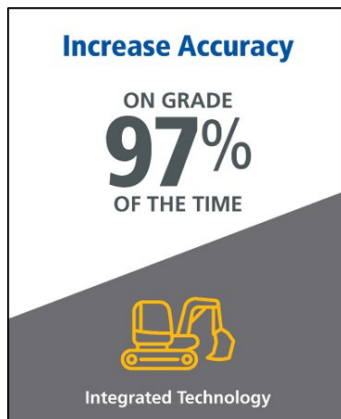
Q: How do your customers measure success?

A: Anecdotally, many customers tell me they're able to perform projects with 50% less equipment. Rework is a big one as well. One contractor told me they had millions of dollars in rework on a large project, but there was virtually none in their first project using machine control.

Companies can establish key performance indicators and use machine control data to measure results.

- How many machine hours did you budget?
- How long does it usually require you to finish specific jobs?
- How much rework do you have?

You can quantify all these on a per cubic metre basis. So I'd say that if you invest the time, you can create some performance benchmarks and evaluate those at the end of the project.



Q: What are the most critical challenges?

A: First of all, there's a lot of supporting infrastructure involved - this is not a bunch of features on machines, but an entire system. To support this system, you need to implement a radio network for 3D positioning using communication protocols compatible with the equipment. Many of our customers have mixed-vendor environments, which can make this tricky. Supporting environments like this is one of our key strengths, and this is one of the areas where we work very closely with our customers.

Another critical point is that machine control is only as good as the data you put into it. Hence, you need to be able to create machine files that are 100% accurate. So again, this is a critical link, and we recommend that contractors either designate a role for this, or hire engineering firms that specialize in it.

All in all, it's incredibly impactful to have machine control, but it's not as easy as just flipping a switch.

Q: How can contractors set themselves up for success with the technology?

A: The first step is selecting the projects where machine control will have the most impact by reviewing your project backlog with an expert and determining where you can benefit most from the technology. The process is typically granular - you look at specific segments of the work and the resources you would normally budget. Then you work backwards from there and come up with a hardware and technology implementation strategy. I would add that the human capital component of that plan is probably even more important than getting the hardware.



Did You Know? The new auto tilt bucket control helps keep the operator on design so that the finish grading can be accomplished without having to align the machine with the target surface.

Once you have the equipment in place, the change management portion is critical. Machine control will change your business processes, so you can't just show up with a design file and a GPS machine and expect to gain efficiencies. It would be best if you had a robust training plan for your technology champion and the operator that's going to be operating your GPS machine.

Q: How does SMS Equipment make all this easier?

A: First, we have a solid implementation team. We're set up to support all major brands, so we're not restricted to any particular equipment or control vendors and can help the mixed-vendor environments that many of our customers have. We also have best-in-class remote support, which allows us to minimize customers' downtime by solving many issues remotely and not having to make a trip to the site.

Takeaways from Kris:

- Contractors are facing a skilled labour crunch as experienced equipment operators retire.
- Machine control allows work to be done efficiently by less experienced operators, and it also is a draw for younger workers who might not otherwise choose construction.
- Machine control also has significant side benefits, including collecting real-time data for quality improvement, training, and as-built models.
- Two critical prerequisites for machine control are GPS positioning infrastructure and the resources for creating accurate machine files.
- The keys to success are selecting the projects in which machine control is most effective and planning for sufficient training and change management.
- SMS Equipment has the unique capability to support multi-vendor environments through a strong implementation team and best-in-class remote support.



Kris Troppman
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| Are you interested in discovering what machine control can do for your business?

