



64th NJ Asphalt Paving Conference March 15, 2021



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CONNECTED MILLING



IN THE BEGINNING. . .



There was Intelligent Compaction.



Troxler



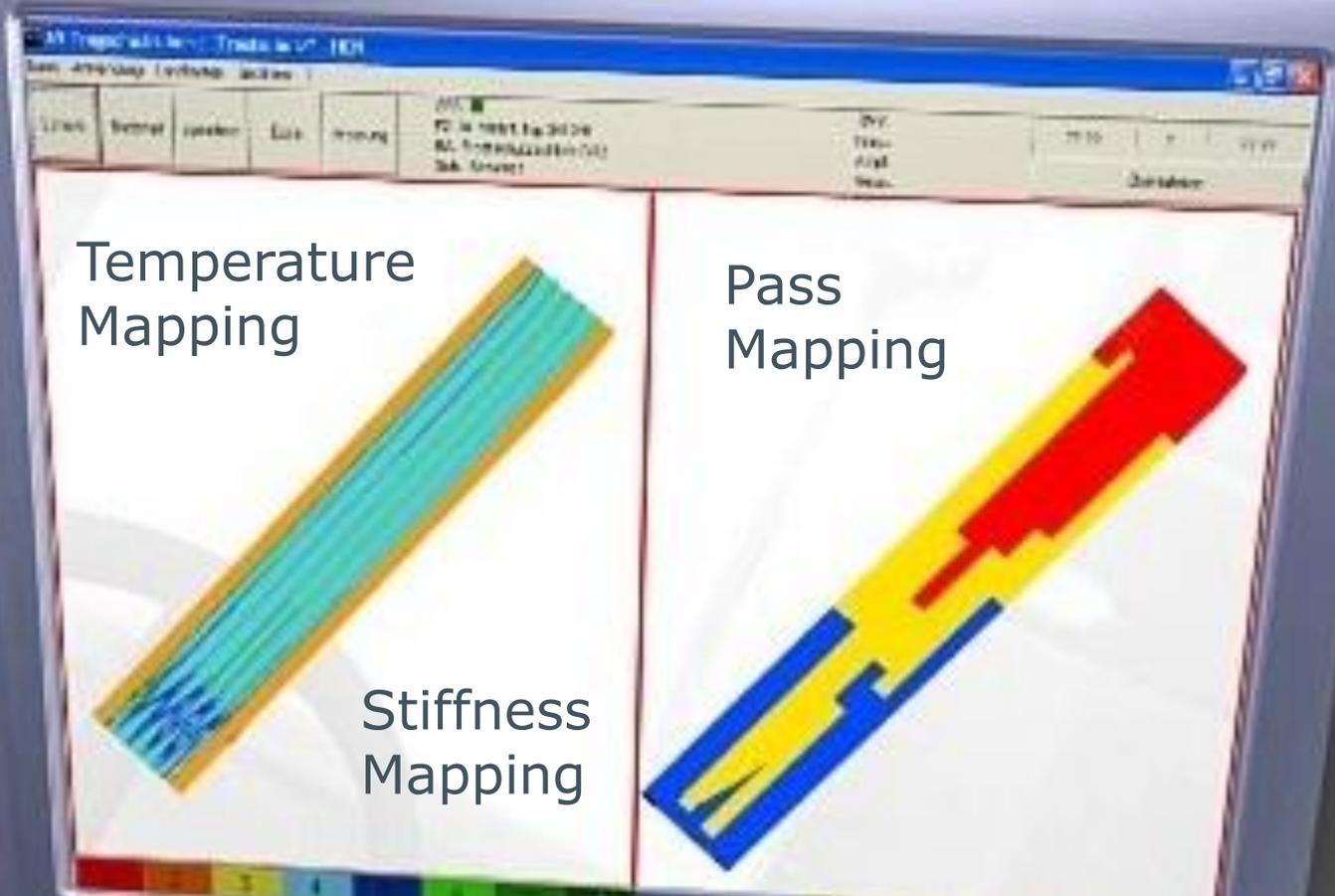
PQI/PDM



Core



TO A GPS BASED SYSTEM . . .



TODAY WE HAVE CONNECTED MILLING



COLD MILLING MACHINE



CONNECTED
MILLING



MACHINE USER



OPERATOR

- ▶ Seamlessly connects the machine, the operator and the project manager
- ▶ Performs an array of functions to simplify the operator's job
- ▶ Provides an array of information to simplify the manager's job

CONNECTED MILLING CONSISTS OF . . .



➤ Automated Functions

- Divot prevention
- Match cut assist
- Obstacle assist
- Conveyor swing assist
- Segmented water spray system

➤ Mill Assist Technology

- ECO mode
- Power mode
- Quality mode

➤ Wirtgen Performance Tracker

- Laser sensors
- GPS receiver
- Complete job reporting

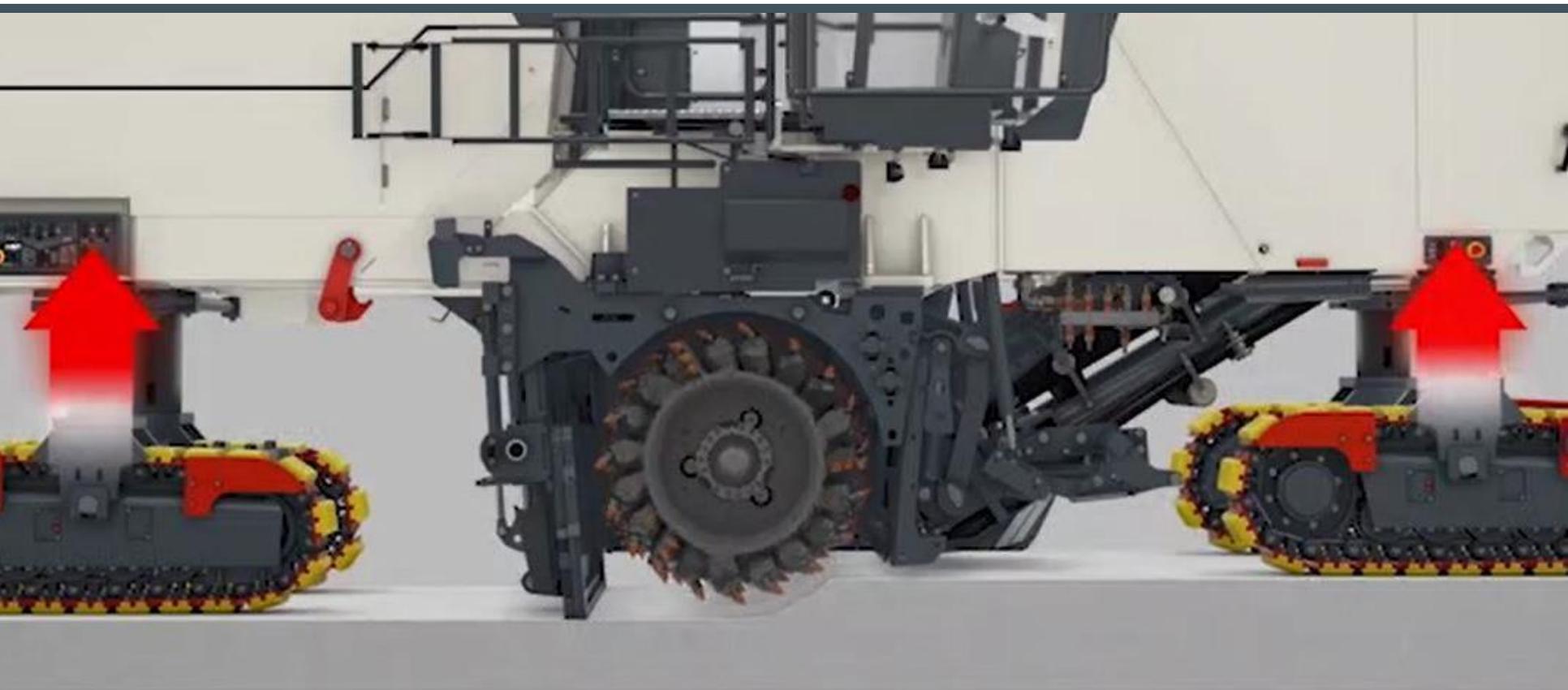
AUTOMATED FUNCTIONS

DIVOT PREVENTION

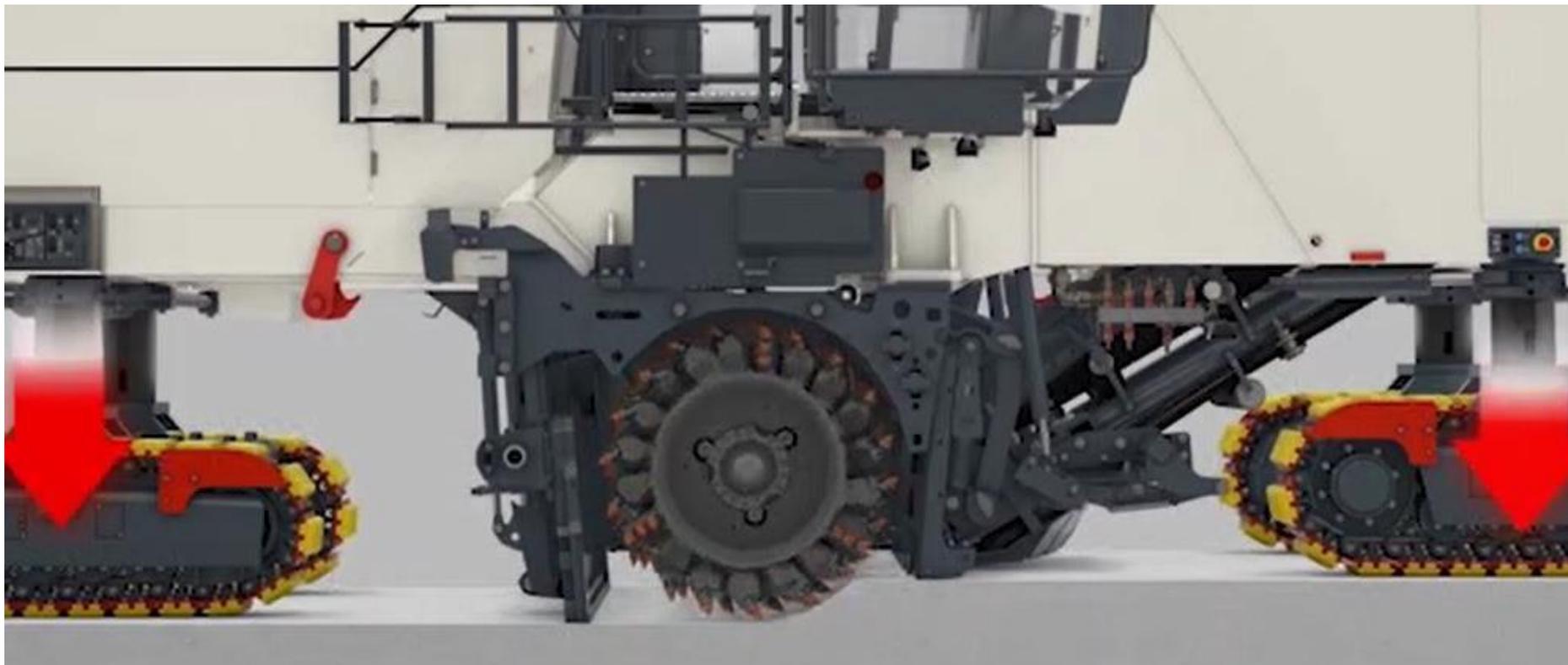


- When the milling machine stops with the drum running, it makes a divot in the milled surface.
- This ultimately affects the rideability of the finished pavement.
- Unless the machine takes care of it automatically.

DIVOT PREVENTION



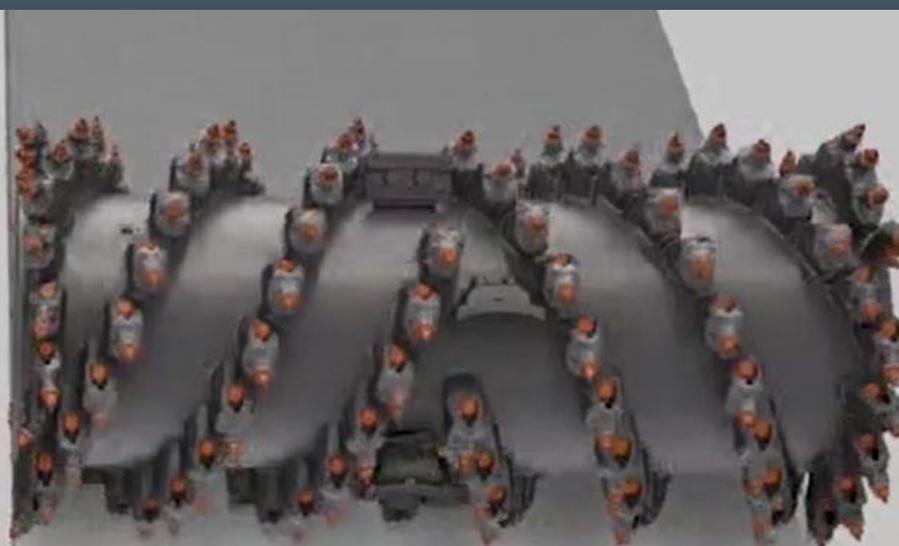
DIVOT PREVENTION



DIVOT PREVENTION



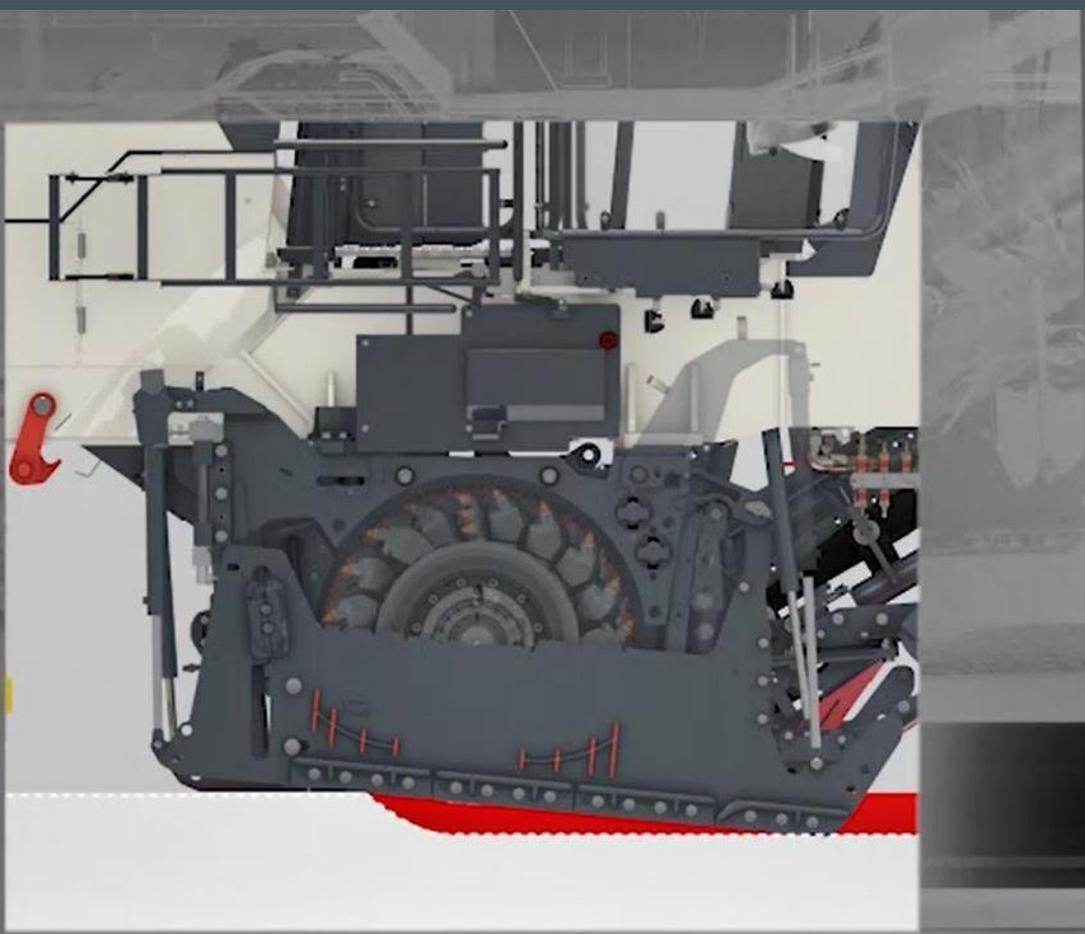
Active Lift Up ON



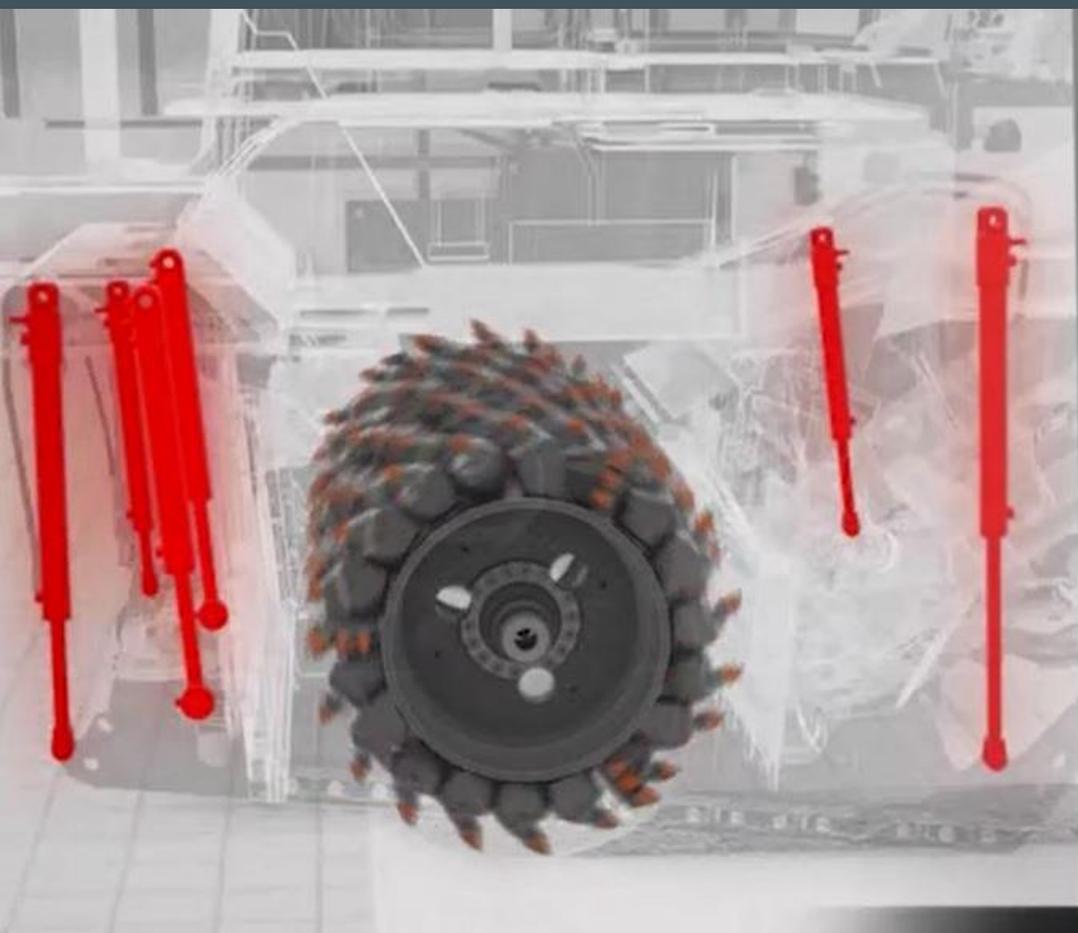
Active Lift Up OFF

MATCH CUT ASSIST

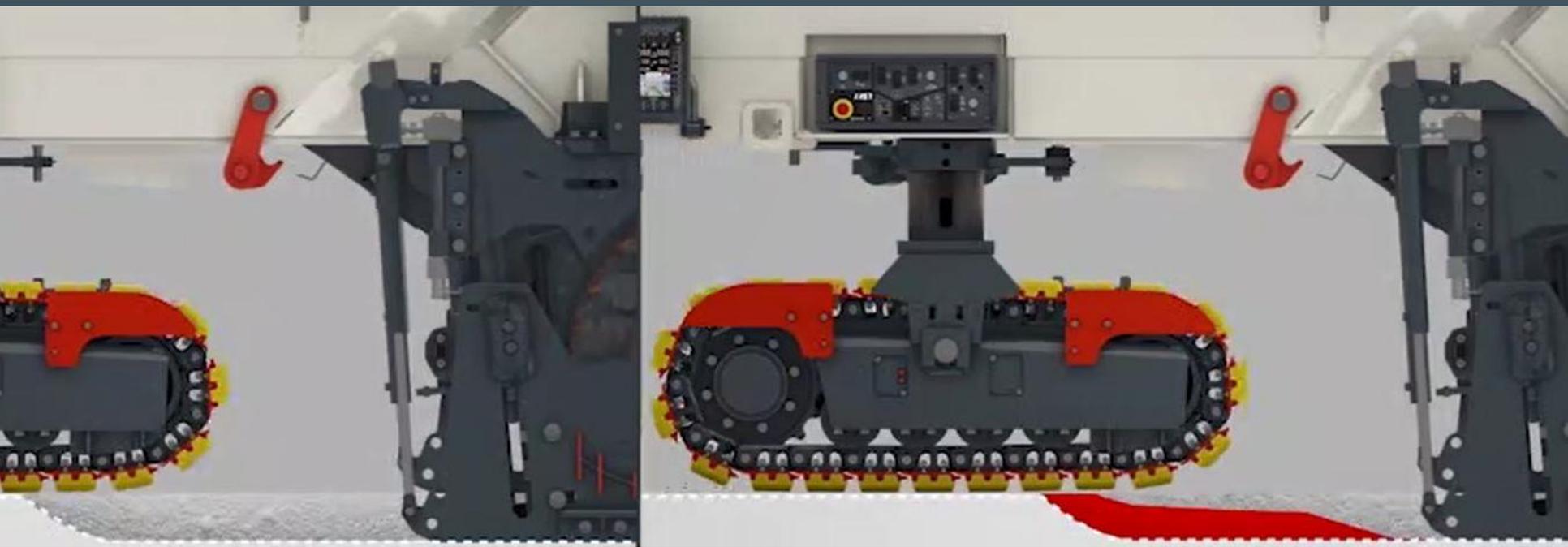
MATCH CUT ASSIST



MATCH CUT ASSIST



MATCH CUT ASSIST



▶ Match cut assist ON

▶ Match cut assist OFF

OBSTACLE ASSIST

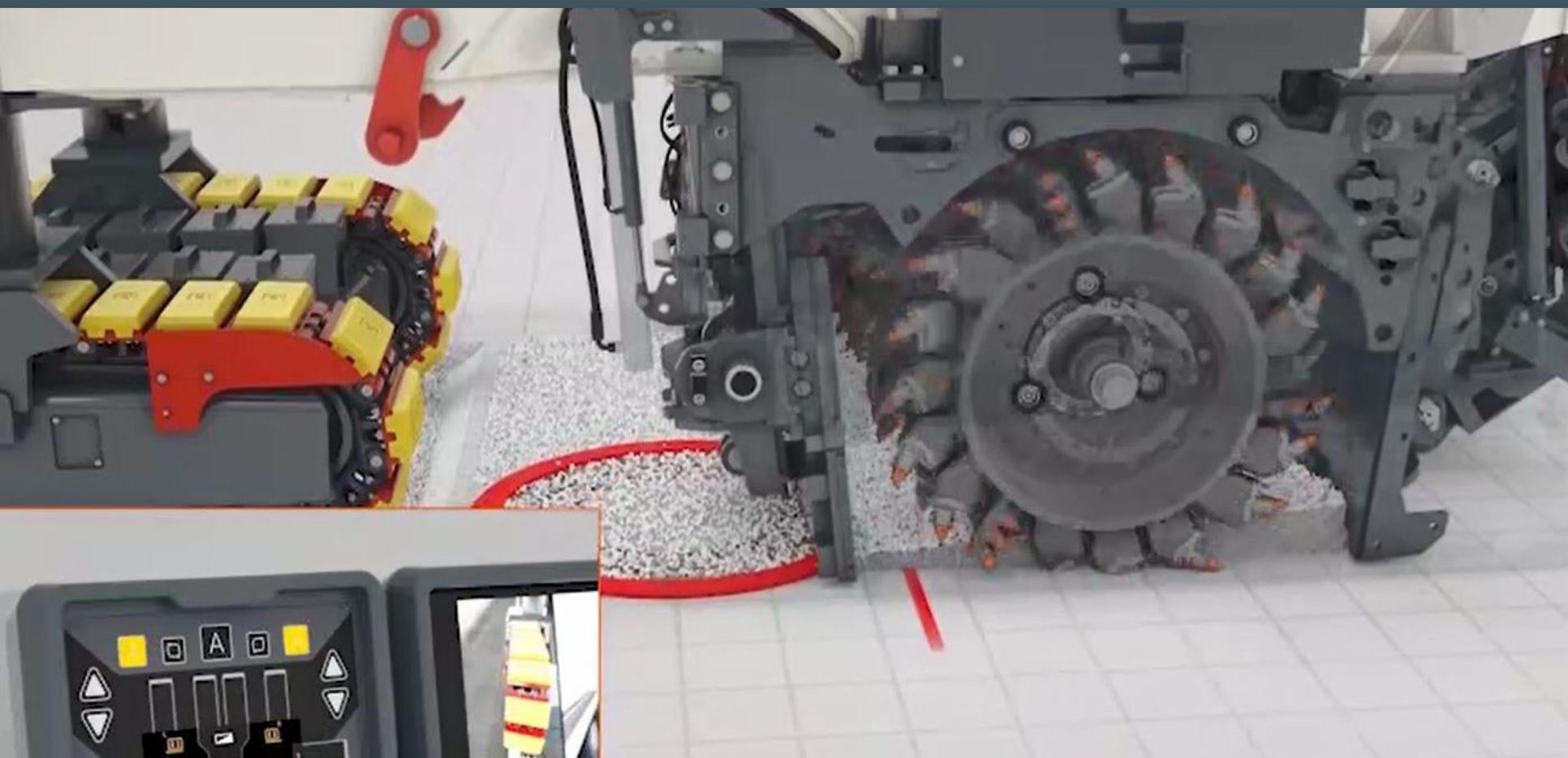
OBSTACLE ASSIST



OBSTACLE ASSIST



OBSTACLE ASSIST



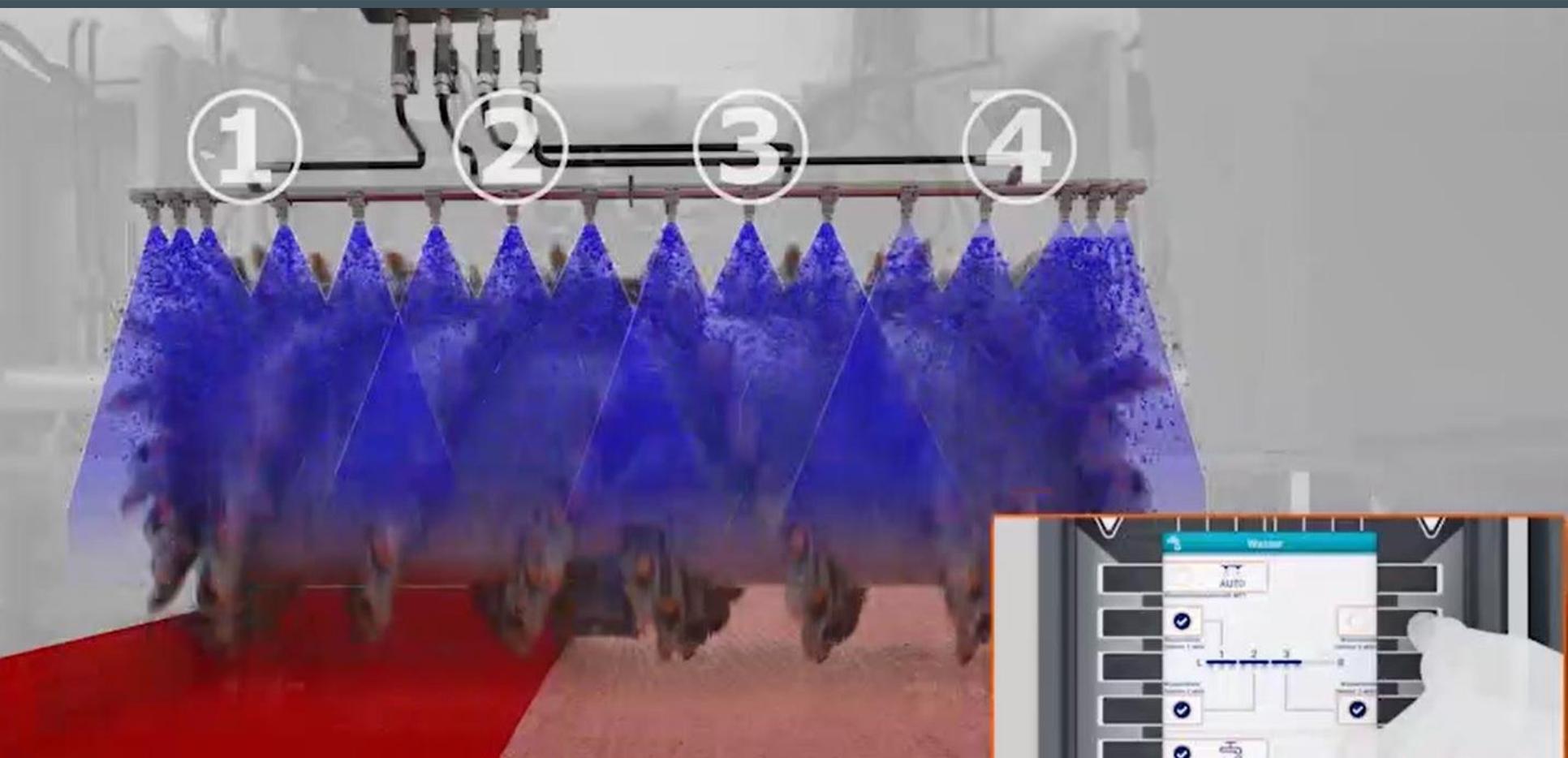
CONVEYOR SWING ASSIST



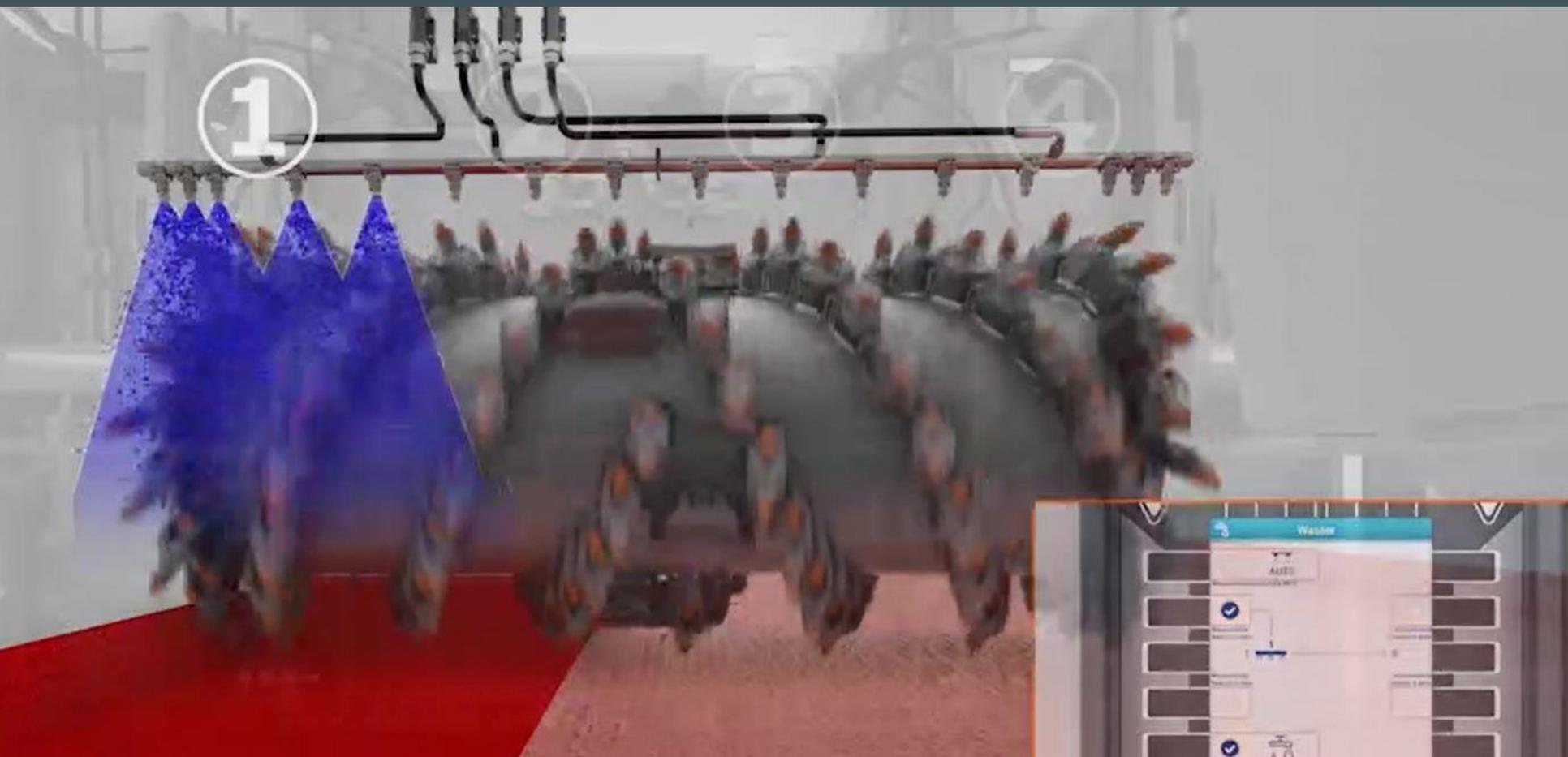
- Uses **smart** conveyor swing cylinders and the steering sensors
- Operator positions conveyor over the truck bed
- System help maintain conveyor position over truck bed while steering around obstacles

SEGMENTED SPRAY SYSTEM

SEGMENTED SPRAY SYSTEM



SEGMENTED SPRAY SYSTEM



MILL ASSIST TECHNOLOGY



AUTOMATIC

Balance performance and costs



ECO

Minimize costs (fuel, teeth, and water)



POWER

Maximize performance



QUALITY (PATTERN)

Consistent surface quality

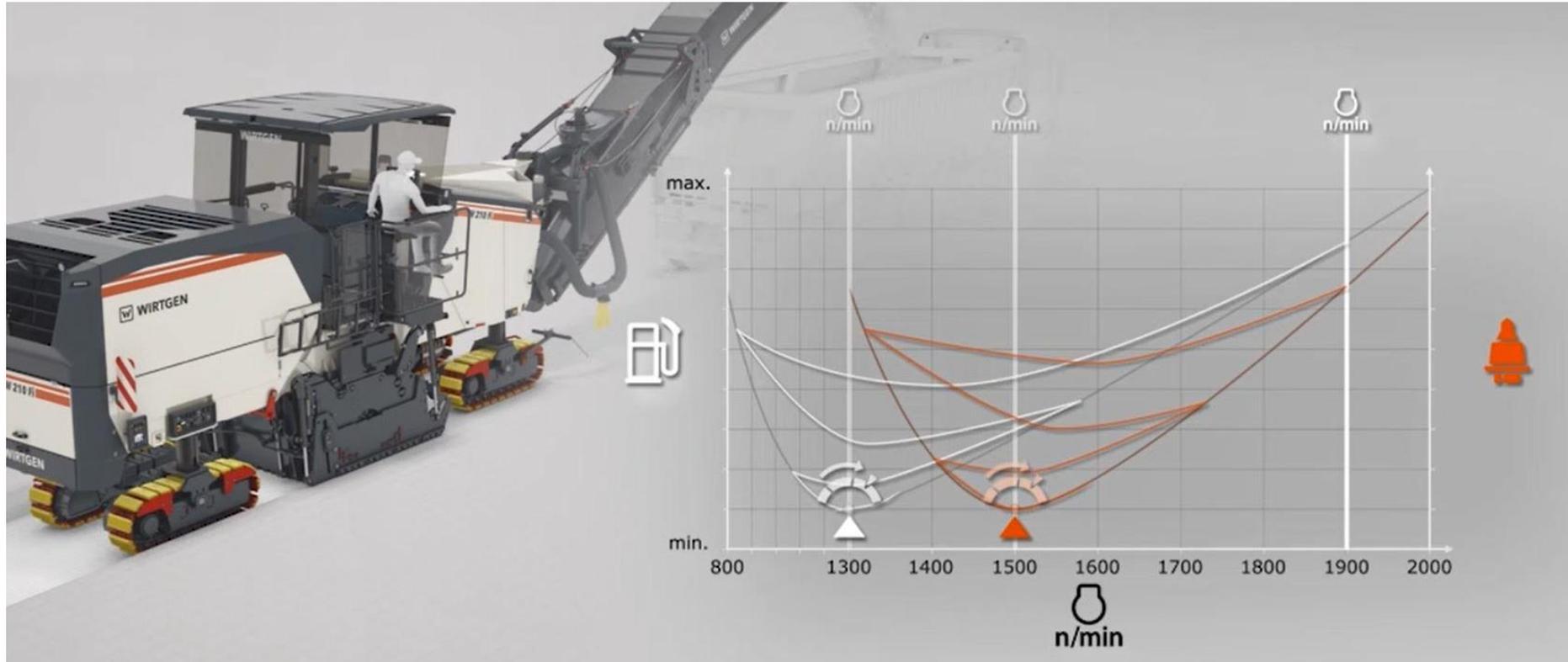
MILL ASSIST TECHNOLOGY

ECO MODE

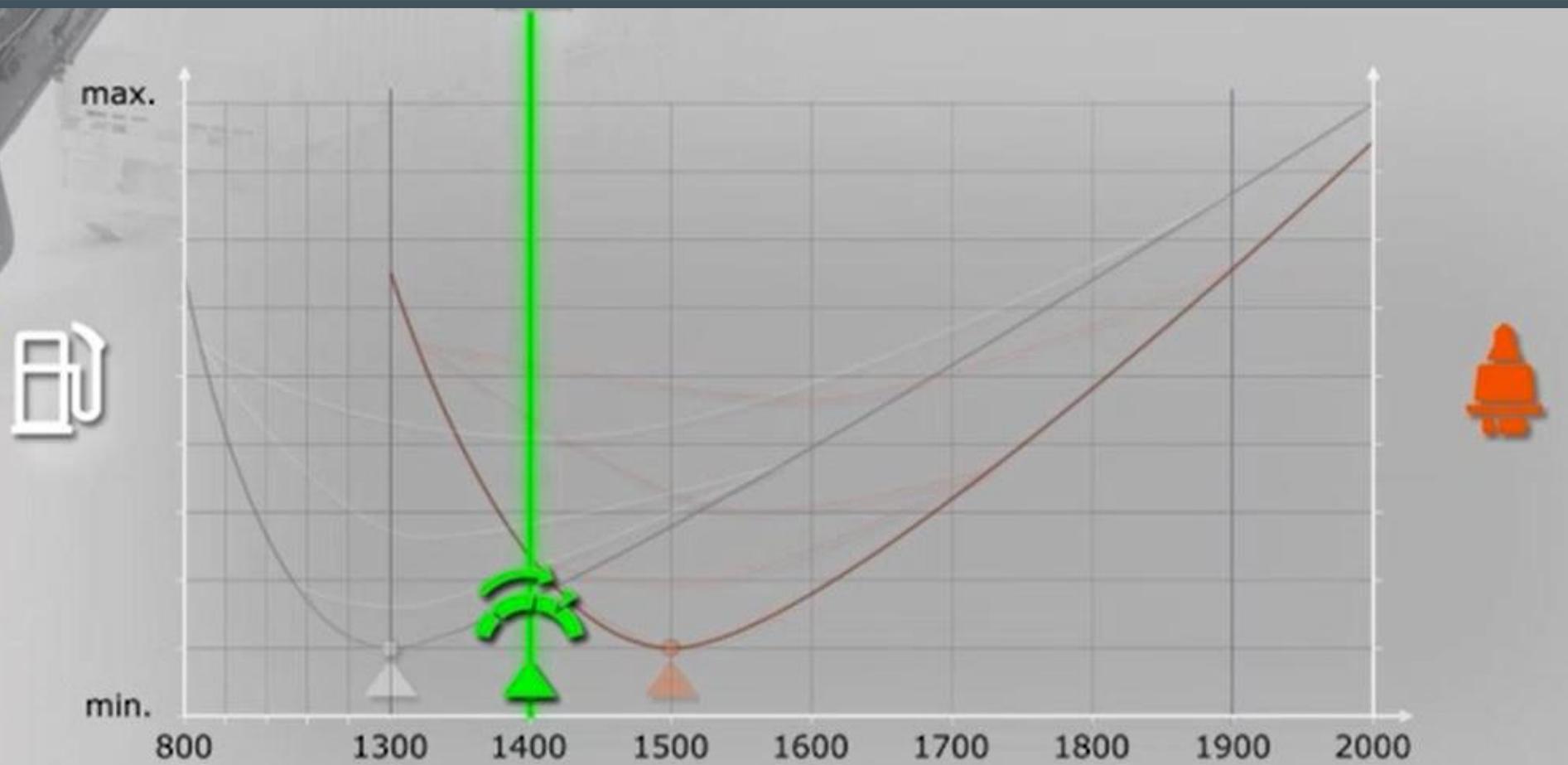
ECO MODE



ECO MODE



ECO MODE



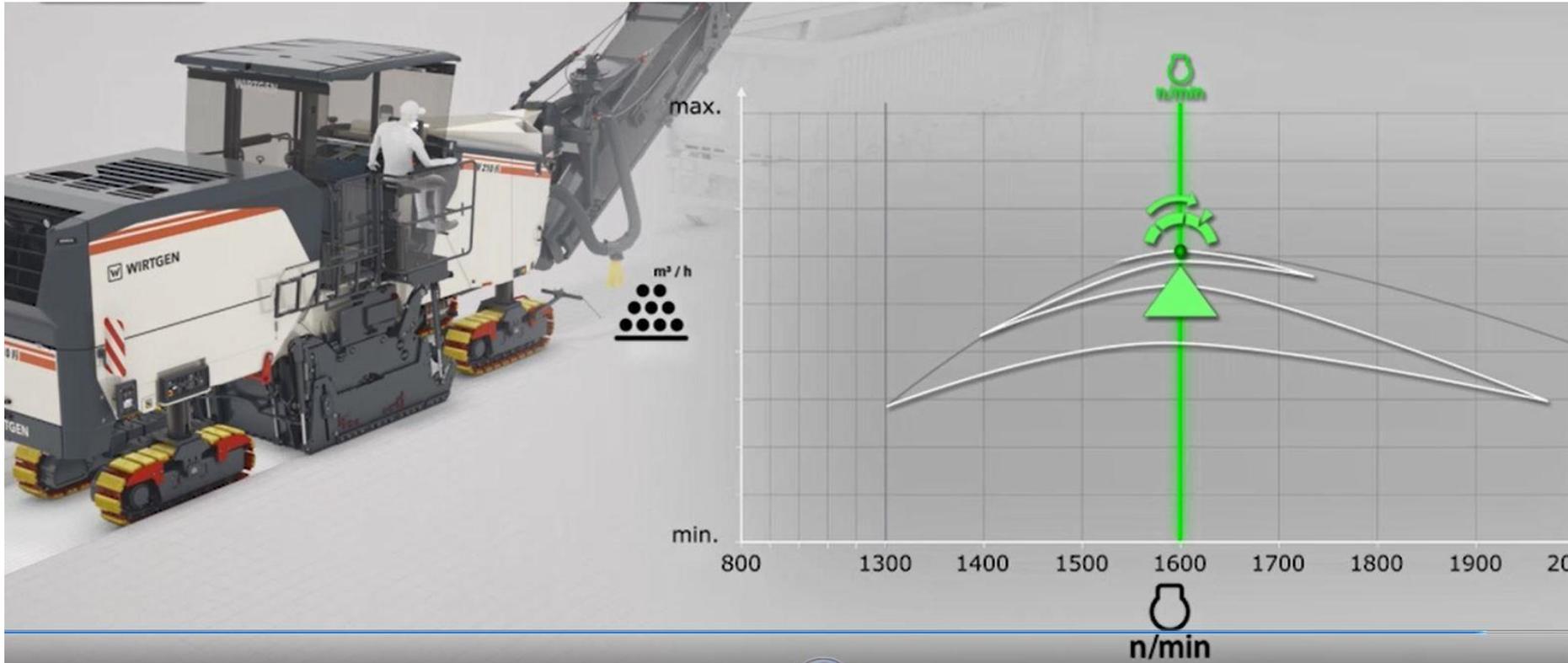
MILL ASSIST TECHNOLOGY

POWER MODE

POWER MODE



POWER MODE



MILL ASSIST TECHNOLOGY

QUALITY MODE

PATTERN/QUALITY MODE





Surface quality index
1 - 10

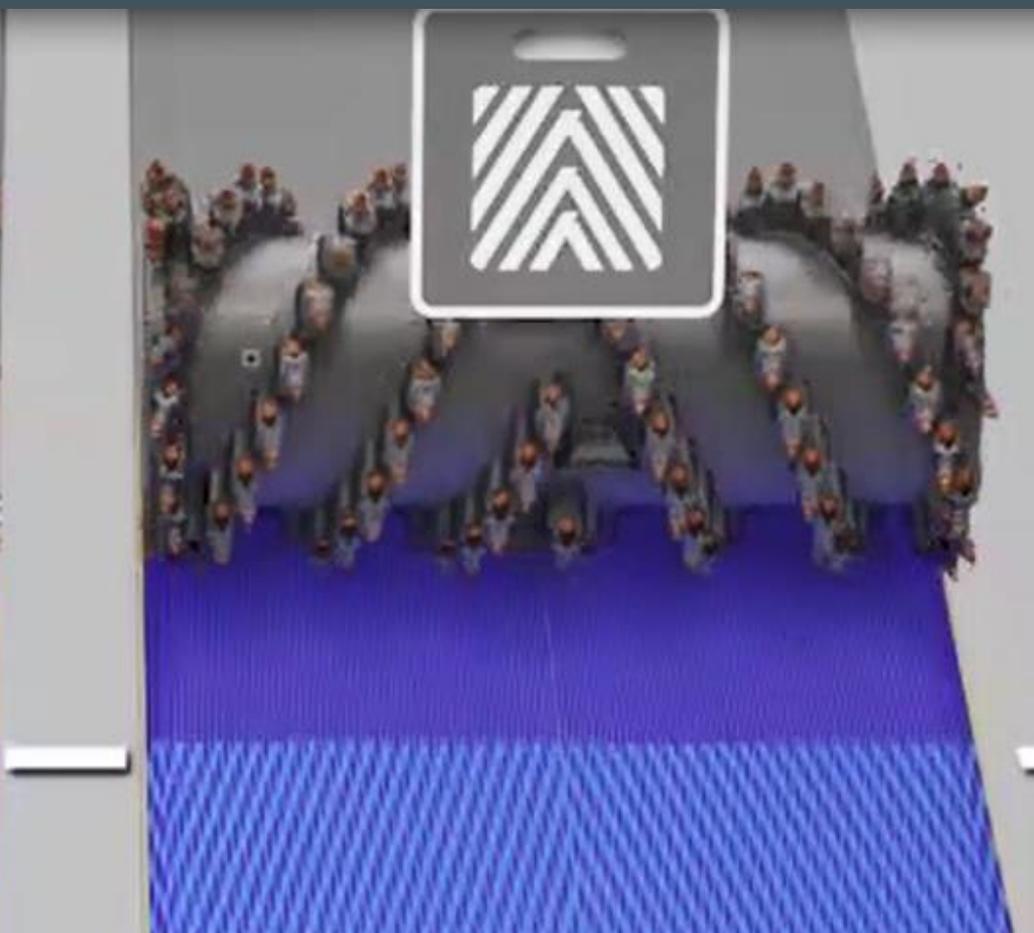
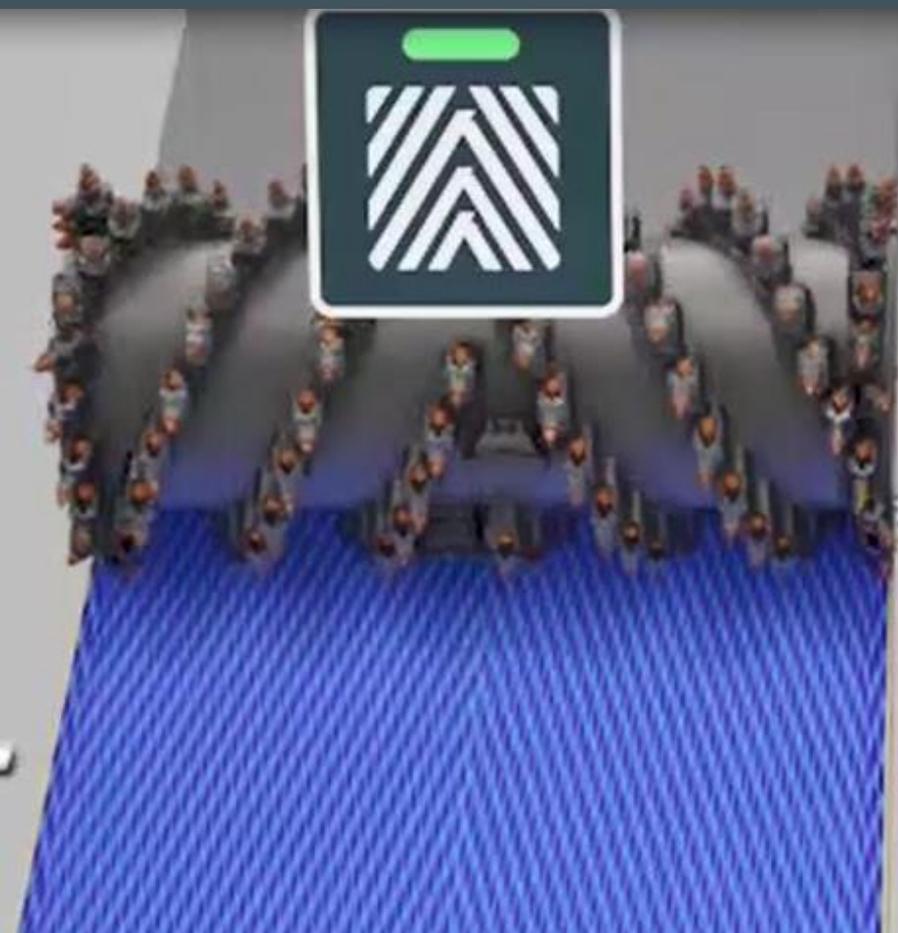


Cutting tooth designation
Milling drum line spacing

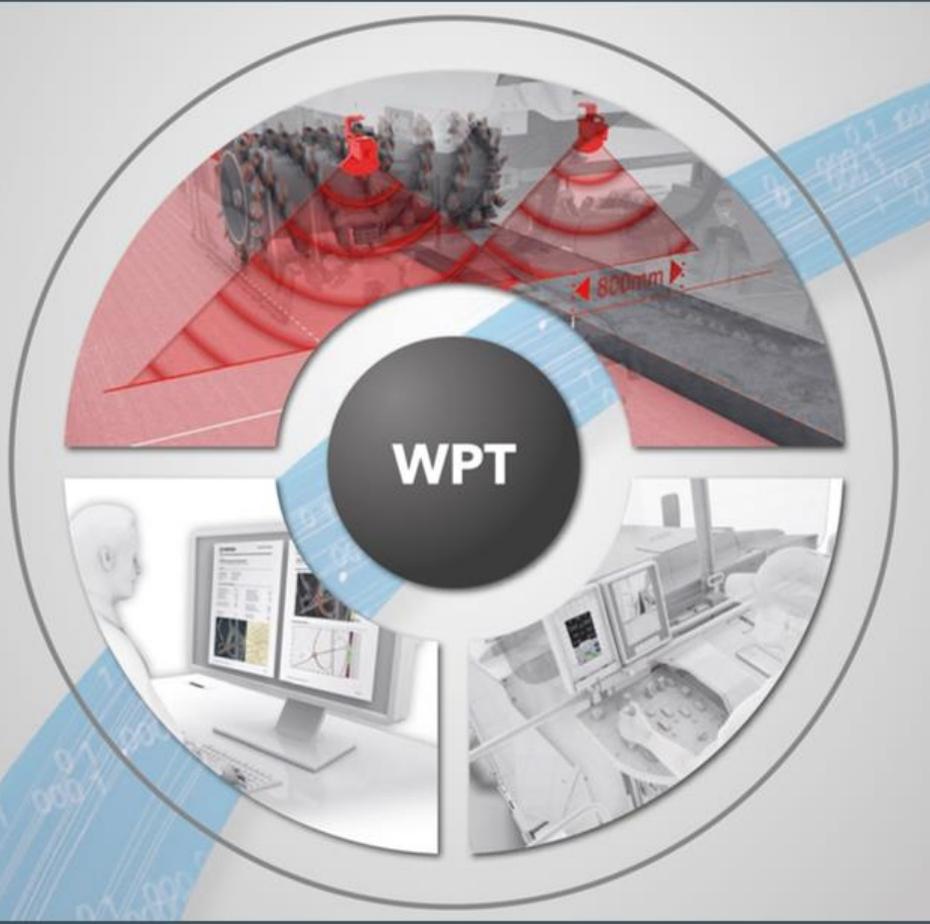
Comparison of
cost vs. performance

PATTERN/QUALITY MODE

 WIRTTGEN

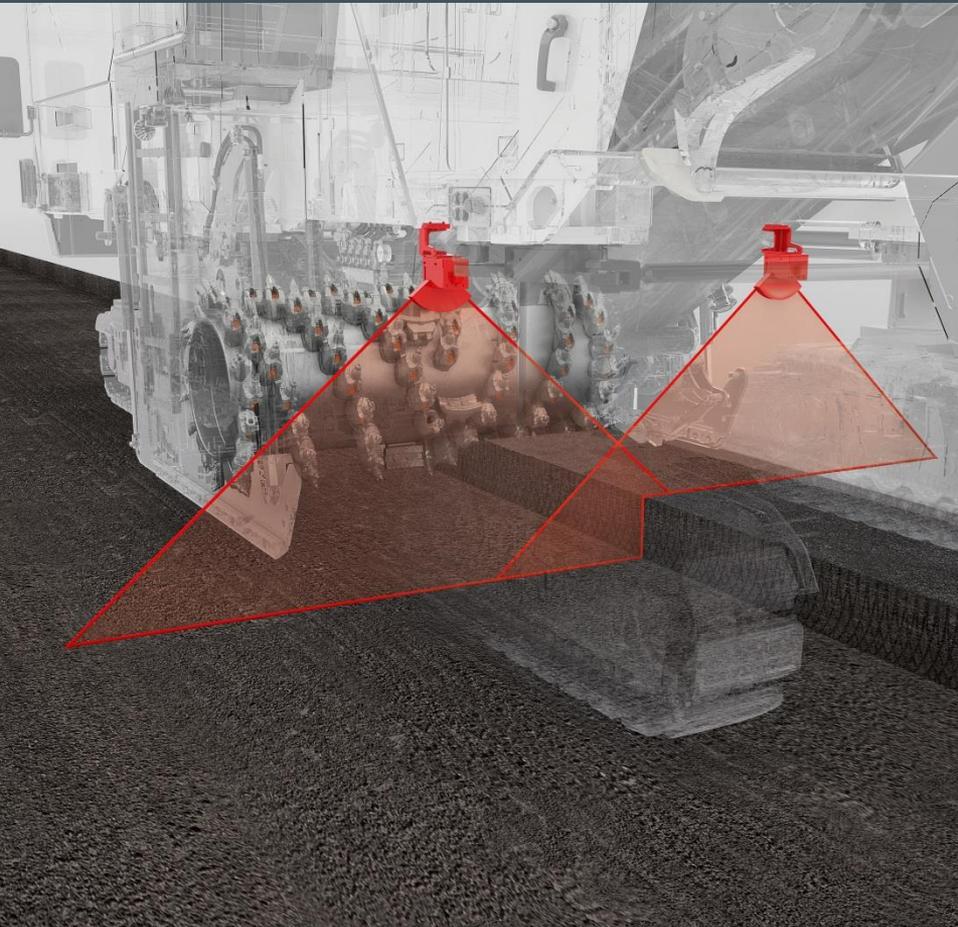


WIRTGEN PERFORMANCE TRACKER

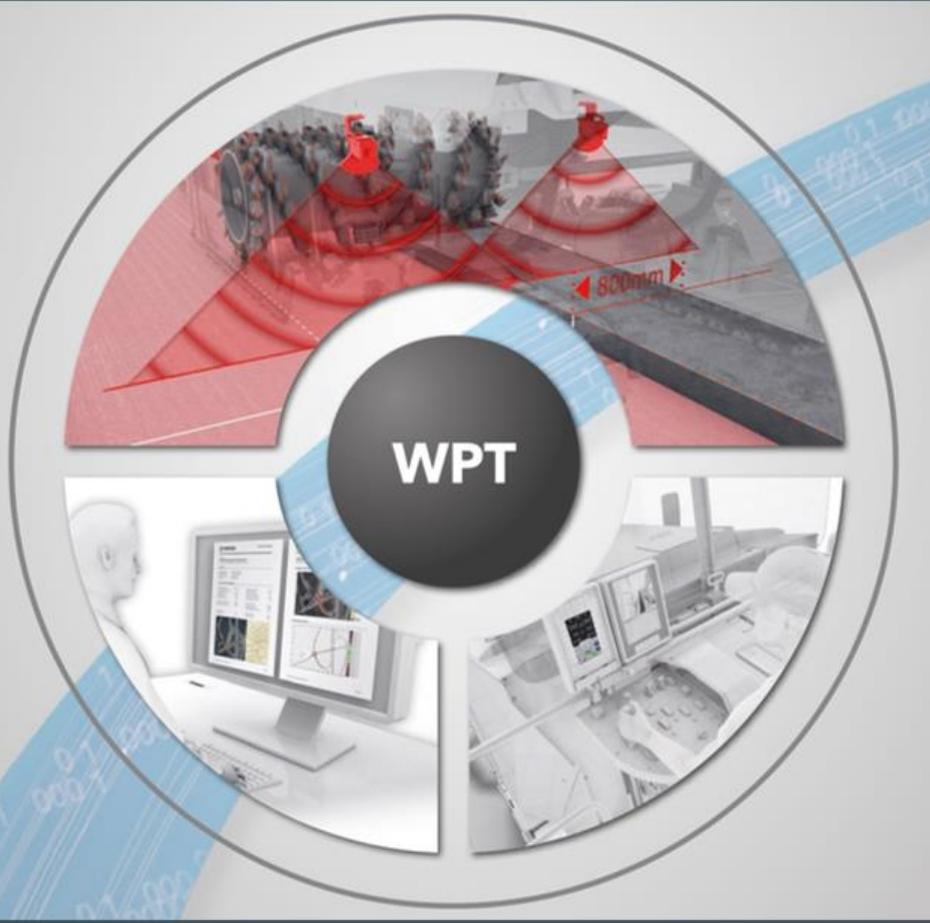


- Documentation of work progress and work performed
- Precise data for job cost calculations
- Documented working efficiencies
- Documented machine performance

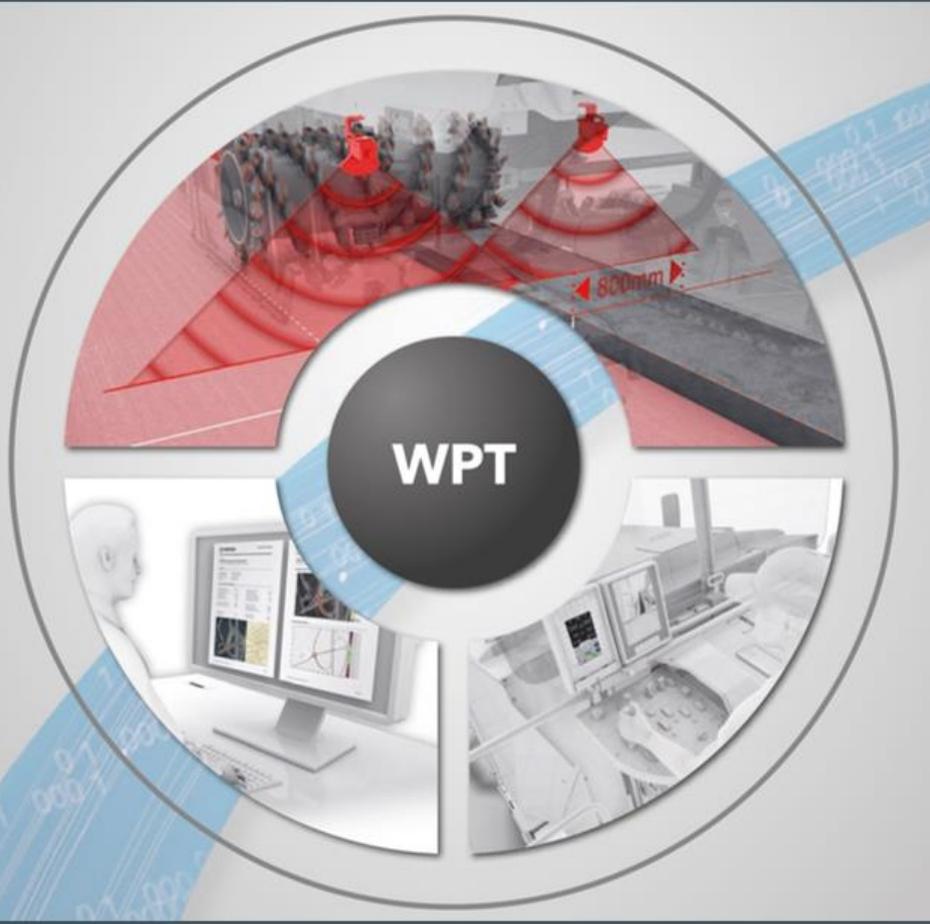
HOW DOES IT WORK?



- ▶ **Laser sensors** constantly determine the exact profile of the material to be milled.
- ▶ **GPS** receiver determines precise machine positioning.
- ▶ **Level Pro** grade control system uses drum side plate and moldboard sensors determine the precise amount of milled material.



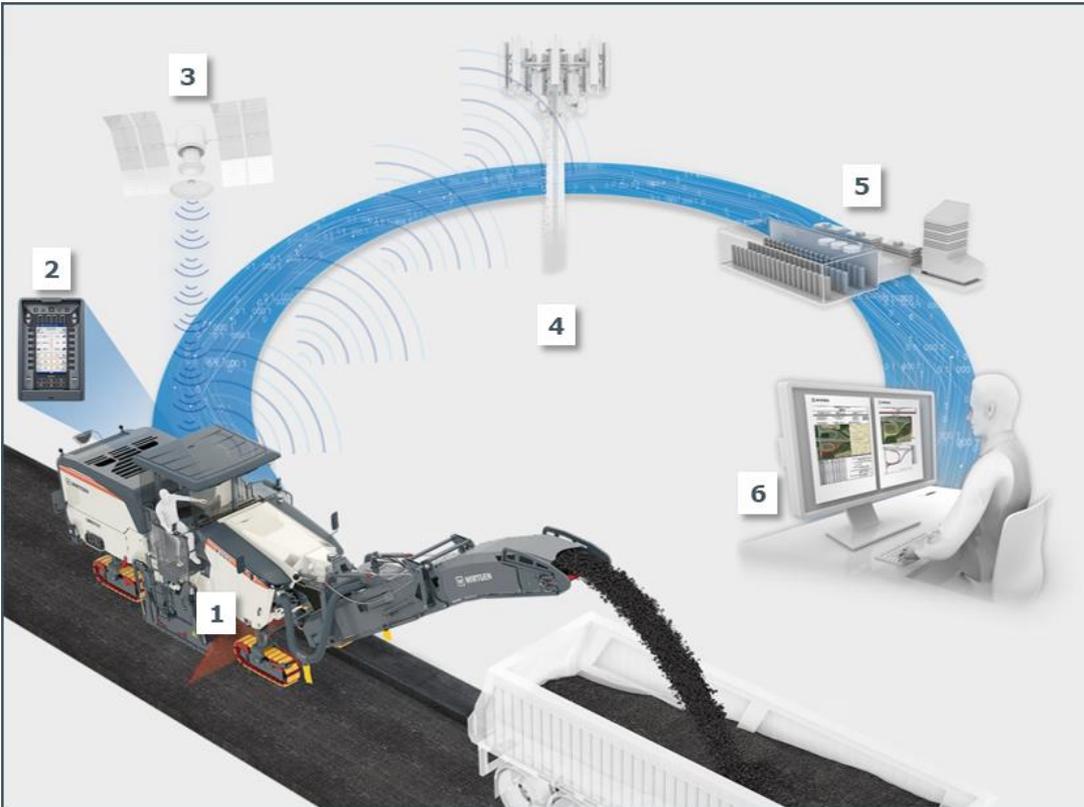
- ▼ Bulk density of milled material
- ▼ Drum type
- ▼ Cutting tooth type
- ▼ Pattern index



- ▶ Milled material
 - yd², yd³, tons, truckloads
- ▶ Fuel consumption
- ▶ Water consumption
- ▶ Tooth consumption
 - recorded by hydraulic tooth ejector
- ▶ GPS job map
 - color coded milling depths
 - job segments

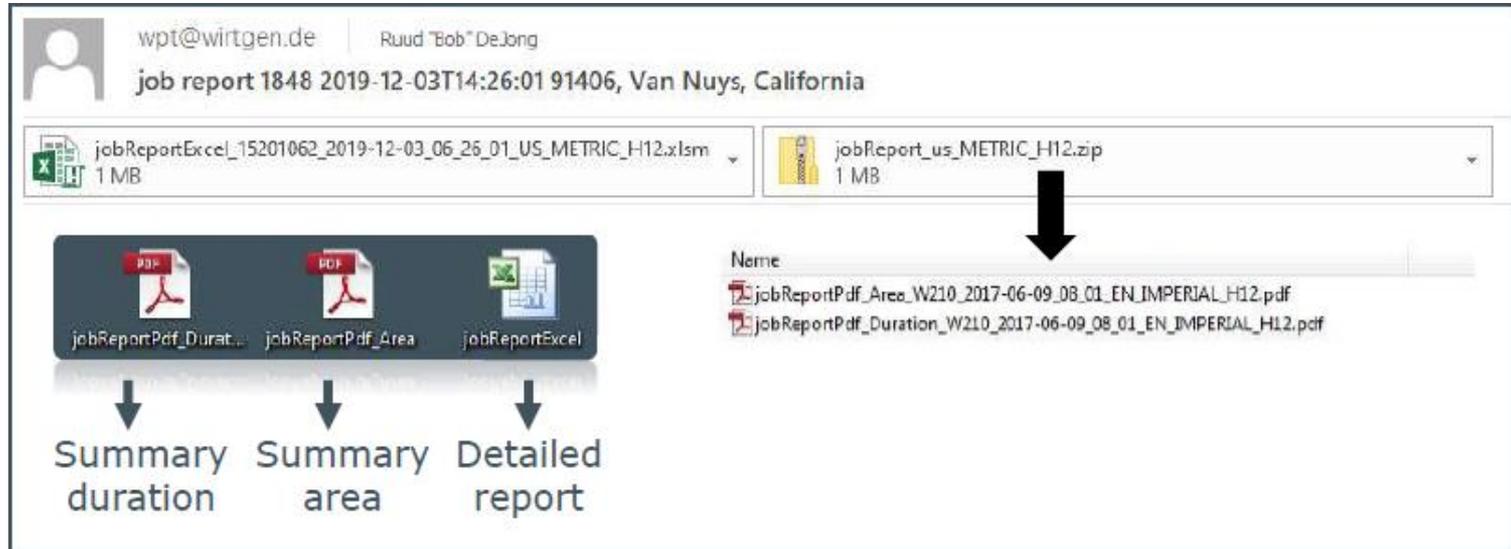
CONVENTIONAL JOB REPORTING





- 1** **Laser scanner** to measure the cross-sectional profile to be milled
- 2** **Control panel** on the operator's platform with current milling data
- 3** **Satellite connection** for precise position sensing
- 4** **Mobile connection** to transmit the data
- 5** **Data centre** to automatically generate the WPT report
- 6** **WPT report** with the most important performance and consumption data for the materials requirements planner

- ▶ Job reports are sent via email



The screenshot displays an email interface. At the top, the sender is identified as 'wpt@wirtgen.de' (Ruud "Bob" DeJong) with the subject 'job report 1848 2019-12-03T14:26:01 91406, Van Nuys, California'. Two attachments are listed: 'jobReportExcel_15201062_2019-12-03_06_26_01_US_METRIC_H12.xlsm' (1 MB) and 'jobReport_us_METRIC_H12.zip' (1 MB). Below the attachments, three PDF icons are shown with labels: 'jobReportPdf_Durat...', 'jobReportPdf_Area', and 'jobReportExcel'. Arrows point from these icons to the text labels 'Summary duration', 'Summary area', and 'Detailed report' respectively. To the right, a file list table shows the names of the PDF files, with a large black arrow pointing from the zip attachment to the first row of the table.

Nome
jobReportPdf_Area_W210_2017-06-09_08_01_EN_IMPERIAL_H12.pdf
jobReportPdf_Duration_W210_2017-06-09_08_01_EN_IMPERIAL_H12.pdf

- ▶ Job report PDF's
 - The two .pdf files contain a **summary of the job milling area and job duration.**



jobReportPdf_Area

WIRTMEN

machine site measuring 15200001-6
Köhlershohner Straße 60, Windhagen, 09.06.2017

machine name: W210
job number: 15200001-6
order number: TEST0001

overview			
total area [m ²]:	1557,3	Ø material density [kg/m ³]:	2343,7
undefined [%]:	8,7	Ø cutting width [m]:	1,95
total weight [t]:	139,1	Ø cutting depth [cm]:	3,8
total volume [m ³]:	59,3		
milling distance [m]:	799,0		



■ milled area



jobReportPdf_Durat...

WIRTMEN

machine site measuring 15200001-6
Köhlershohner Straße 60, Windhagen, 09.06.2017

job begin: 09.06.2017 10:01
job end: 09.06.2017 11:27
machine name: W210
job number: 15200001-6
order number: TEST0001

overview		
operating hours at job begin [h]:	1198	job duration [hh:mm]: 01:26



WIRTGEN

inactive site measuring 15200001-6
order no. FKST0501
Köhlerhofstr Straße 60, Windhagen, 00.06.2017

job name: 00.06.2017 00.00 machine name: W202 job no.: J000001-6
job date: 00.06.2017 01.00 job location: 00.06.2017

total area [m²]: 1000.0 a-matched details [ha/m²]: 2000.7 finished tracks: 00
contaminated areas [m²]: 63.7 a-milling width [m]: 1.00 max. number 4: 0
total milled area [m²]: 100.0 a-milling depth [cm]: 3.0 max. number 10: 0
max. number 20: 0
total volume [m³]: 10.0 job time [h:min]: 00:00 current operating time [h]: 0
milling time [h:min]: 00:00 transport volume [t/ha/m²]: 00.00

Table with 5 columns: order no., milled area, milled area, milled volume, milled volume. Rows include total and individual job data.

Notes:
* load/unload area: Percentage of total area with non-identifiable milling depth and/or angle. These areas are processed with full milling width and max depth and radius.
** job duration: Accumulated drive duration, duration in minutes that job and operator left after task was not started job site.
*** milling time: milling time only.
**** order no.: Change order no. in this column to fit to your hardware.
***** assignment order no.: Assignment of milling order to one order no. in table "milling order no."
**** milled area: milled area with milling width and depth.
**** milled volume: milled volume with milling width and depth.

➤ Job Report in Excel provides detailed results and is editable



- An automatically generated report shows the daily milling performance including all consumables, a precise layout diagram, etc.



- ▶ The machine operator is directly supplied with all job information via the display panel.



- ▶ Seamlessly connects the machine, the operator and the project manager
- ▶ Performs and array of functions to simplify the operator's job
- ▶ Provides and array of information to simplify the manager's job

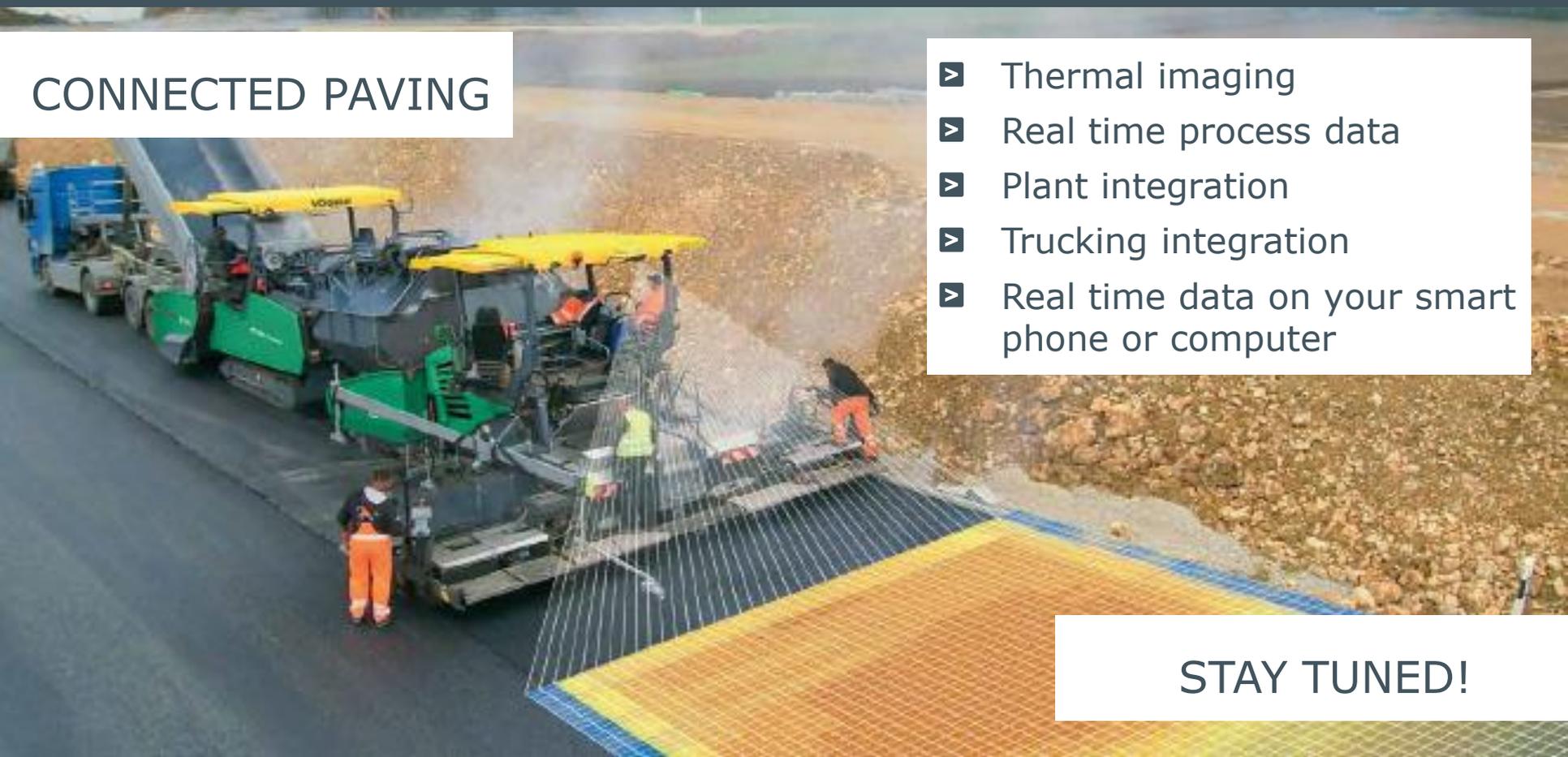
. . . AND JUST AROUND THE CORNER



CONNECTED PAVING

- Thermal imaging
- Real time process data
- Plant integration
- Trucking integration
- Real time data on your smart phone or computer

STAY TUNED!



THANK YOU!

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