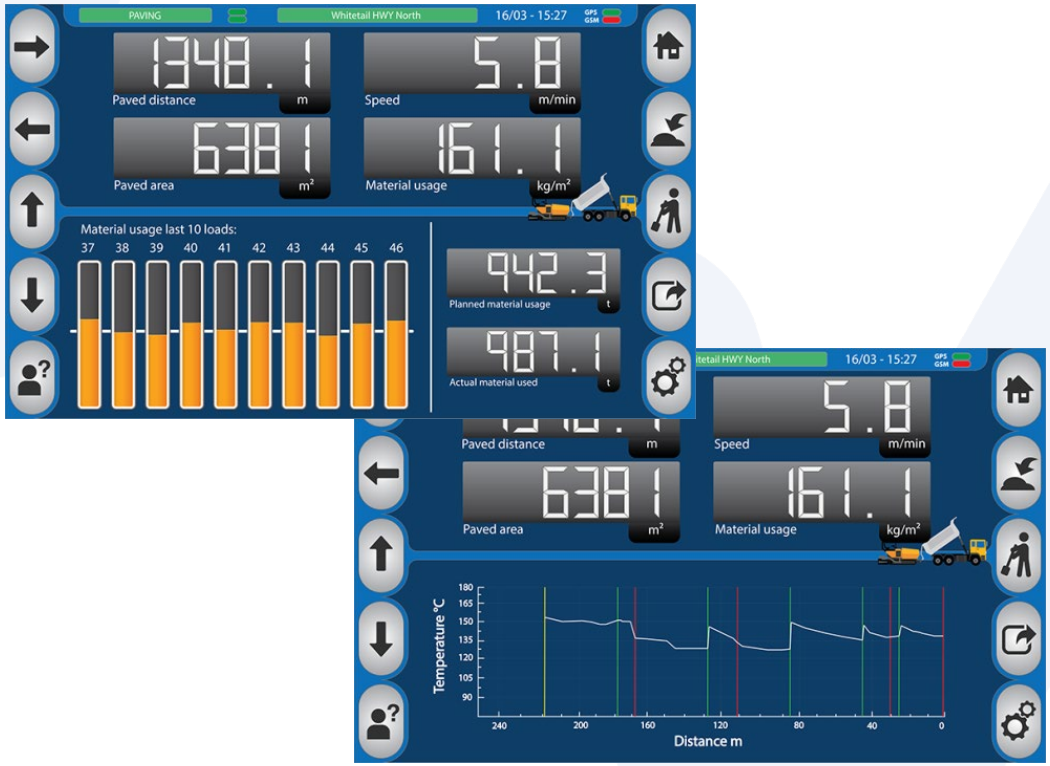
TECHNOLOGIES
PAVING INNOVATION

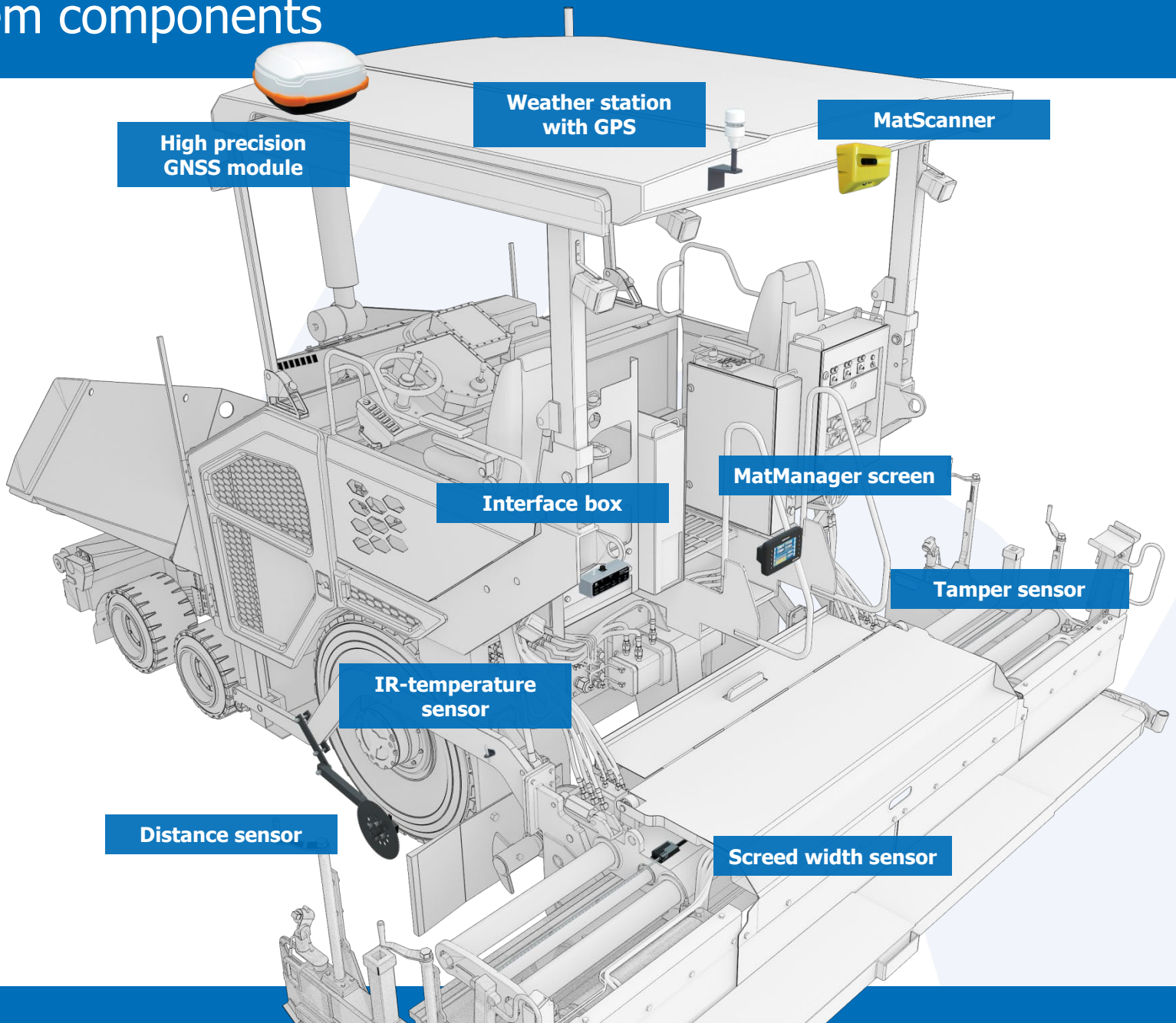
MatManager Paving Quality System

What does it do?

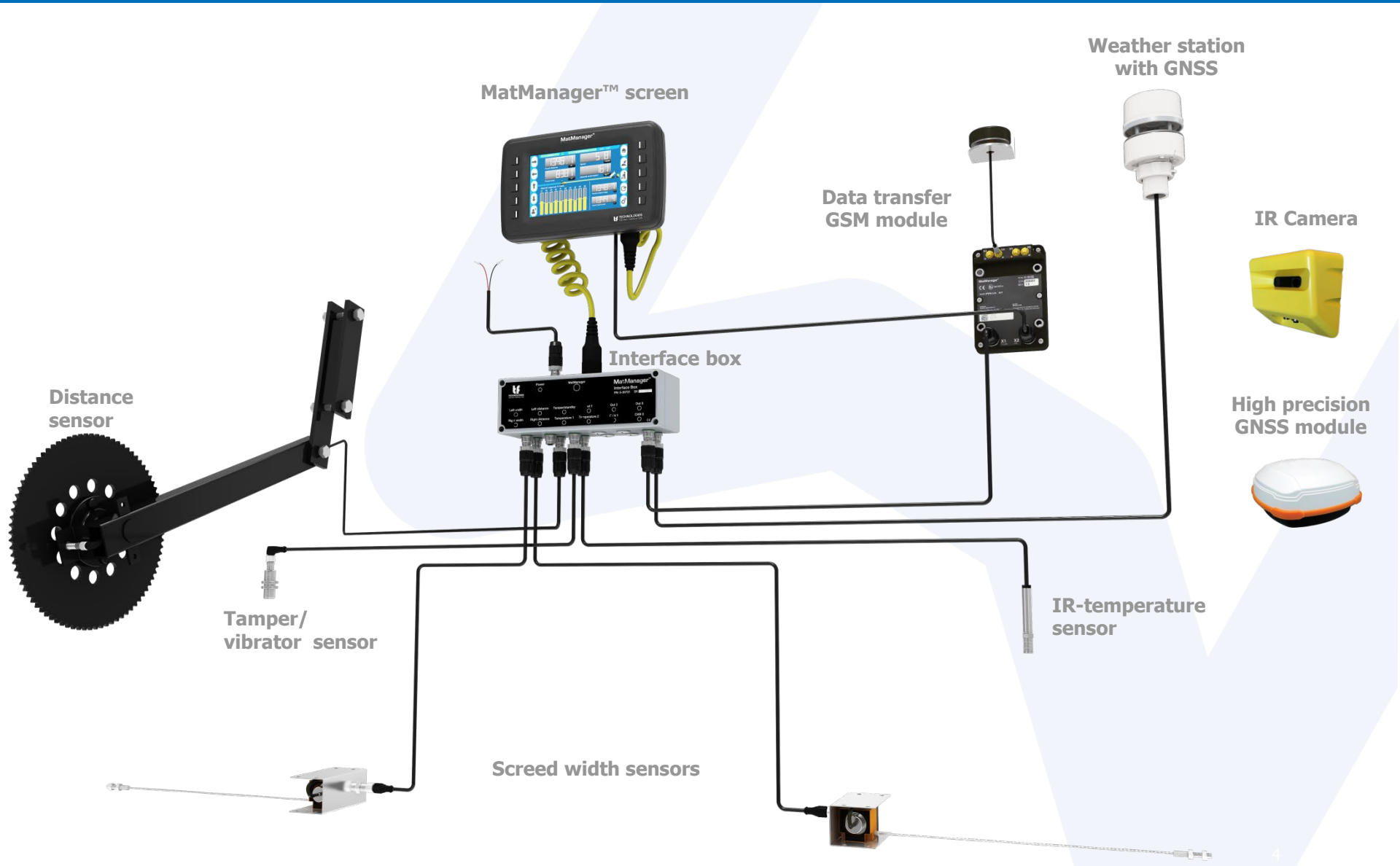
- MatManager™ registers job data on an asphalt paver and present this real time for the operator
- Data can be exported to the MatManager™ server MatWiser™ for review and reporting



System components



System components



MatManager Input and Output

Create Job
- Job name
- Planned lay rate kg/m2

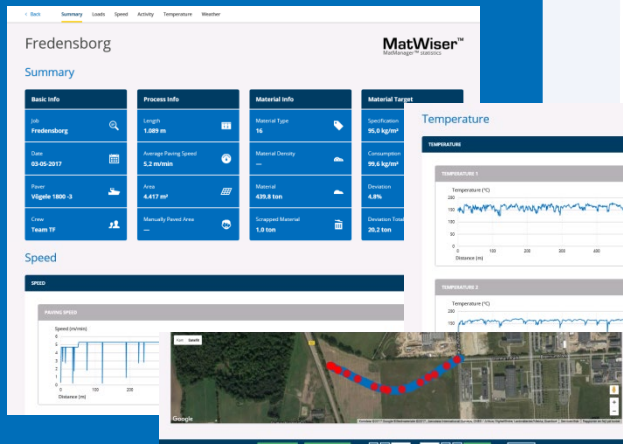
Enter truck loads
- #1 – 25986 kg
- #2 – 22689 kg
- #3 – 25449 kg
- #4 – etc.

Input

Output

MatManager Output
- Actual rate of spread kg/m2
- Length & Area Paved
- Mix temperature
- Machine data

MatWiser Reporting



Calculates Lay Rate Instead of Mat Thickness

Planned lay rate (kg/m2)

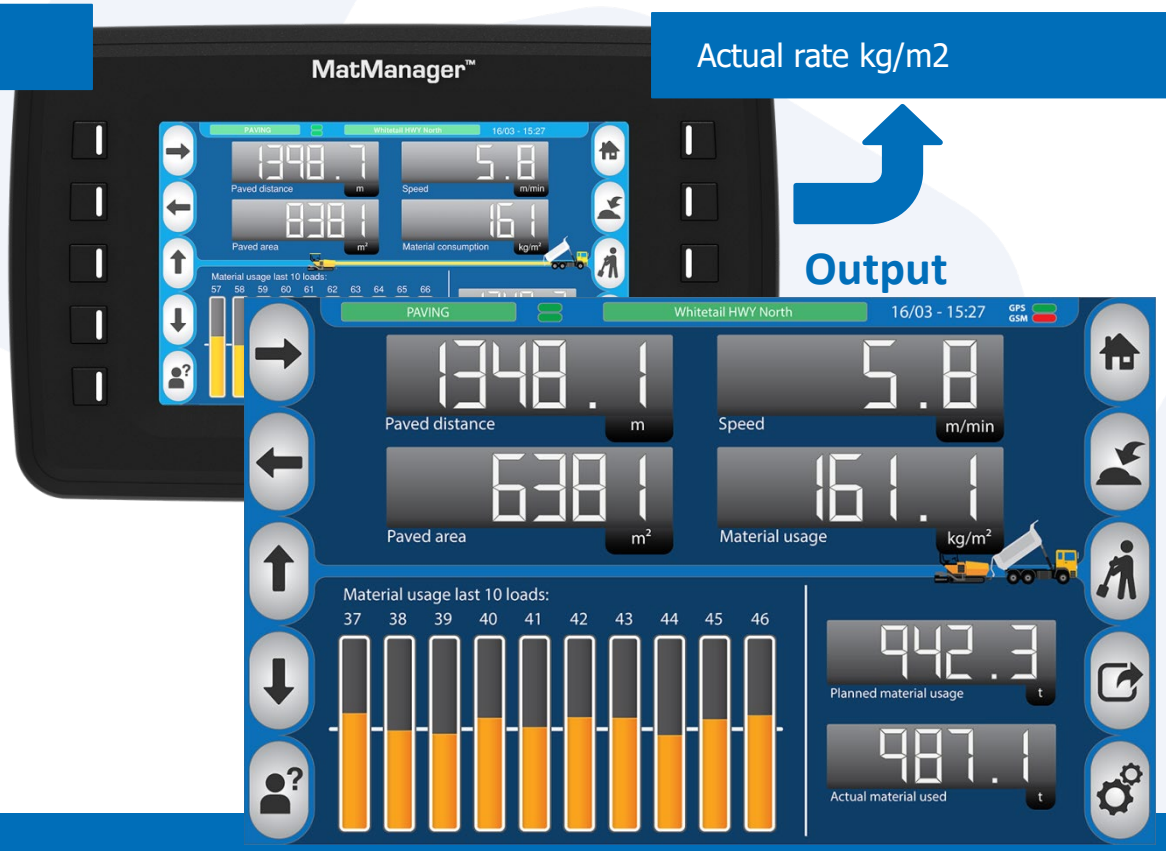
$$= \frac{\text{Material consumption (kg)}}{\text{Paved area (m2)}}$$

Mat thickness (m)

$$= \frac{\text{Material consumption (kg)}}{\text{Density (kg/m3)} \times \text{Paved area (m2)}}$$

Planned lay rate kg/m2

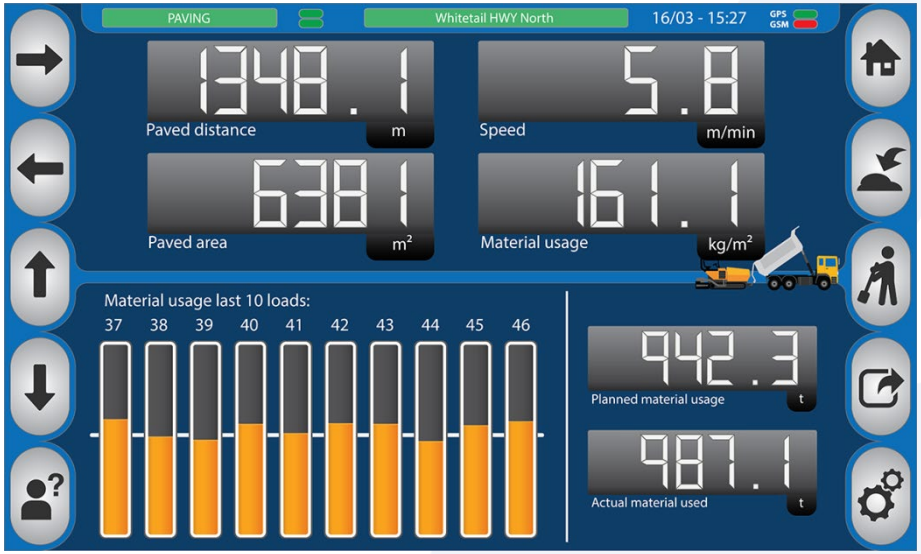
Input

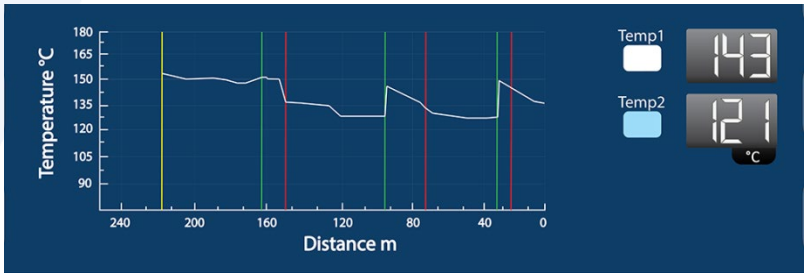


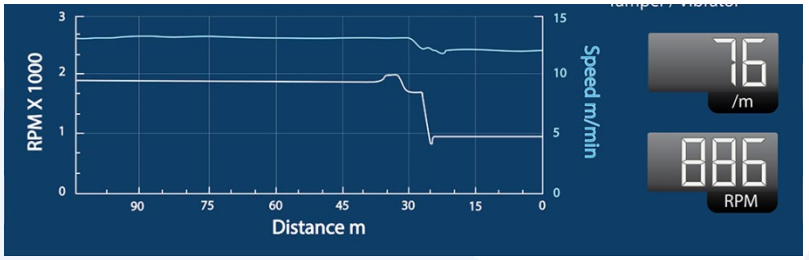
Actual rate kg/m2

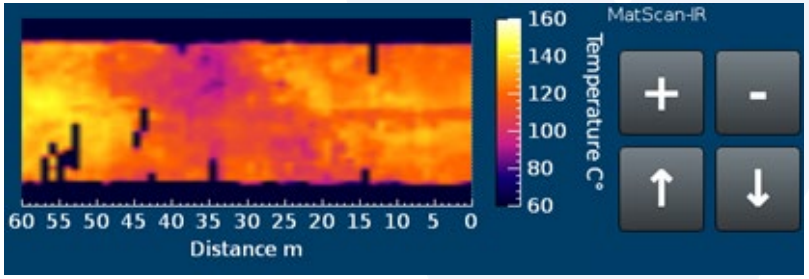
Output

MatManager Screen Outputs









- **Paved distance (m)**
- **Paved area (m2)**
- **Material consumption (kg/m2)**
- **Planned material consumption (ton)**
- **Actual material consumption (ton)**
- **Material consumption per hour (kg/h)**
- **Graphical presentation of temperature**
- **Graphical presentation of stops/loads**
- **Paving speed (m/s)**
- **Tamper/Vibration frequency (rpm)**
- **Graphical presentation of tamper strokes vs. speed**
- **Mat width (m)**
- **Weather data**
- **Visual temperature segregation**

MatScanner - Detection of Thermal Segregation

The MatScanner IR-camera will perform continuous line-scans of the entire paving width as the paver moves forward.

Measurements are sent to the MatManager for display of a live heat map.

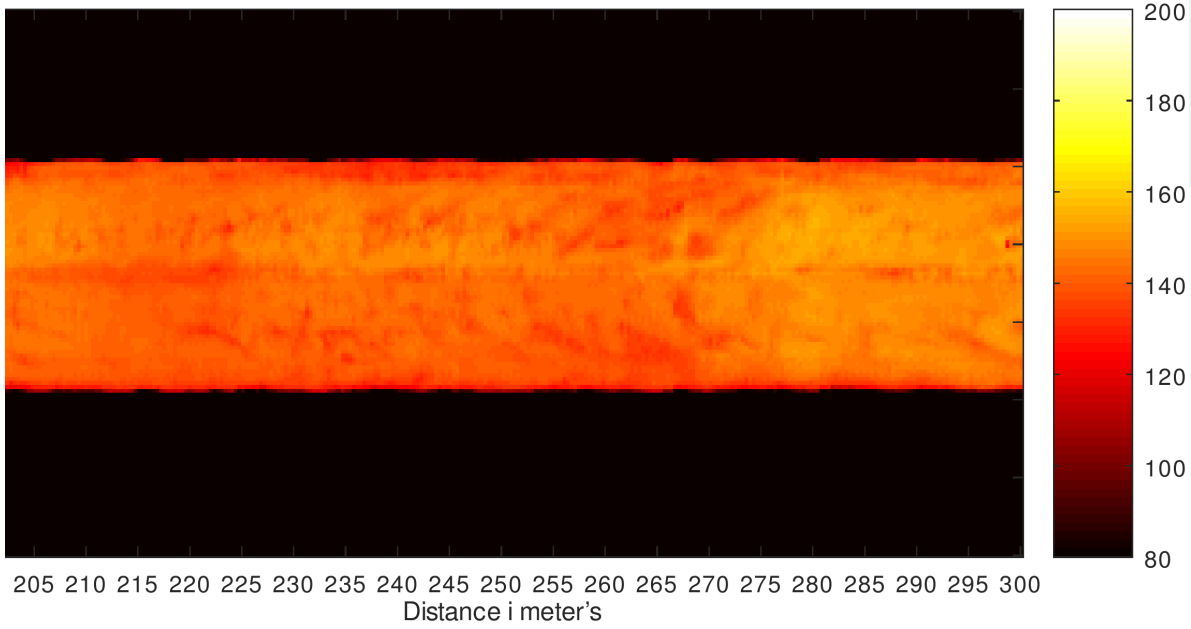
Raw data are subsequently transferred into MatWiser for further analysis.

Thermal Profiling in MatWiser

MatScanner functionality at the MatWiser web interface:

- Display and print out of heat-map
- Calculation of "risikoareal"
- CSV export of MatScanner RAW data
- Encrypted GSM data transfer

IR Heatmap. Matman sn. 67730. Job ID. 18740602 - 29-05-2018. Temp = C



MatScanner Camera

Camera specifications	
Sensor resolution	280 pixel horizontally (X)
Measurement accuracy	+/- 2.0°C or +/- 2.0%
Min. field of view angle	96° horizontally
Temperature range	0 to 250°C
Temperature resolution	0.1°C
Angle to ground surface	45° to 90°

The camera will typically be mounted on the roof of the paving machine and pointed backwards looking down on the newly laid asphalt with an angle of around 50° to the ground.

With a distance to the ground of 4,5m the measuring width of the line scan will be 10m

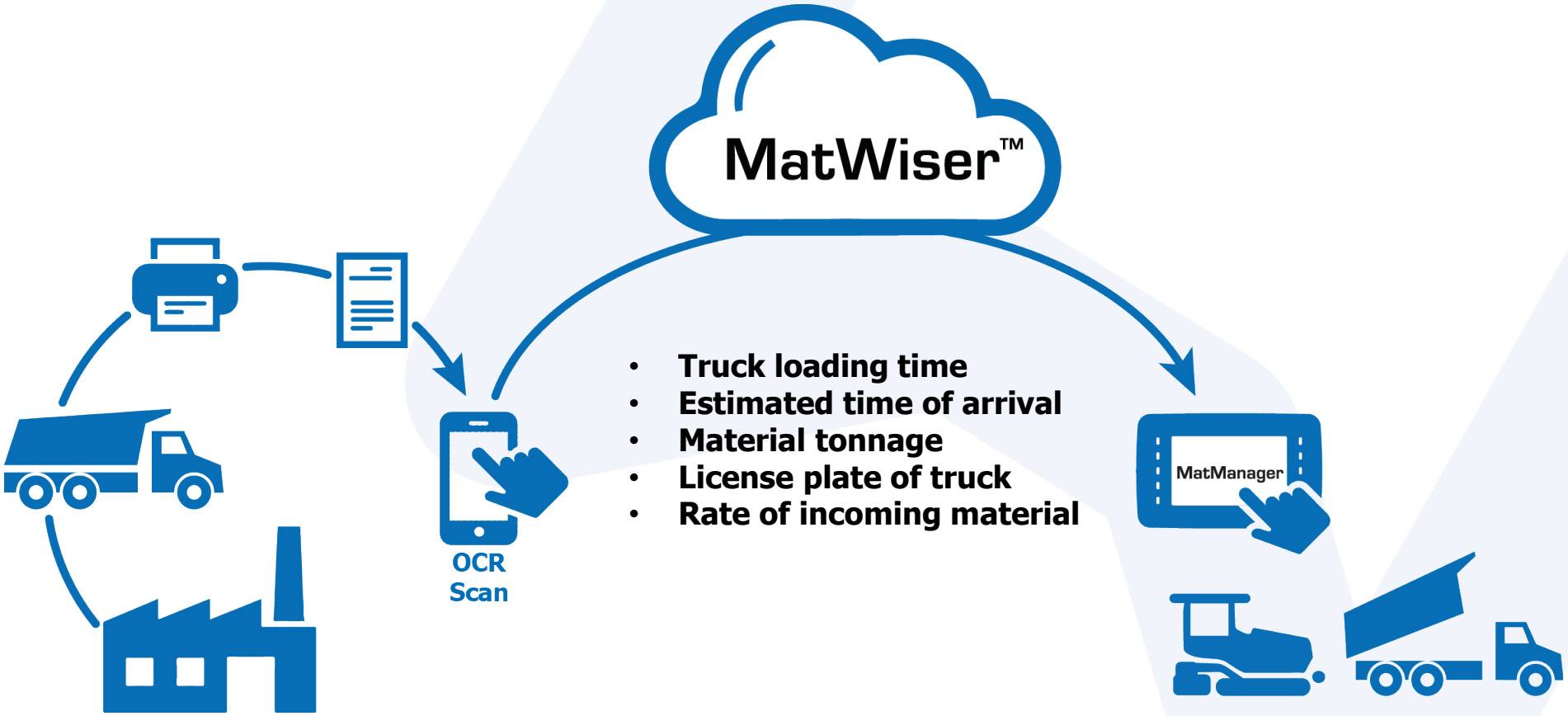
High Precision GNSS with RTK Option

High precision GNSS option for the MatManager system:

- Assisted GNSS with Atlas® L-band corrections
- Accuracy better than 0.1m 95% of the time
- Assisted GNSS is subject to an Atlas subscription fee

Module can be upgraded to support RTK corrections in areas where available.

Truck Management Light



- **Truck loading time**
- **Estimated time of arrival**
- **Material tonnage**
- **License plate of truck**
- **Rate of incoming material**

Benefits of using the MatManager

Machine operator

Area & length paved	**Eliminate errors and time spent doing manual measurements and calculations of paved area**
Material consumption	**Continuously monitor material consumption to assure right amount is laid**
Mix temperature	**Monitor and register material temperature**
Truck Management	**Keep track of hot mix supply chain**
Machine parameters	**Visual indication of paving width, speed, stops and tamper frequency**
Plant coordination	**Use hourly material consumption for better timing of incoming trucks**

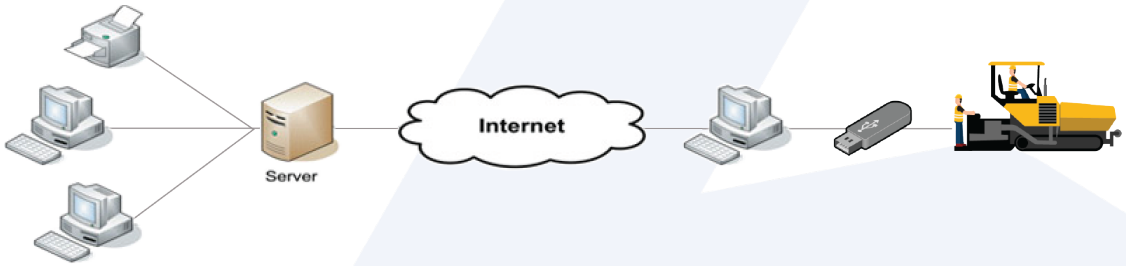
Benefits of using the MatManager

Project manager

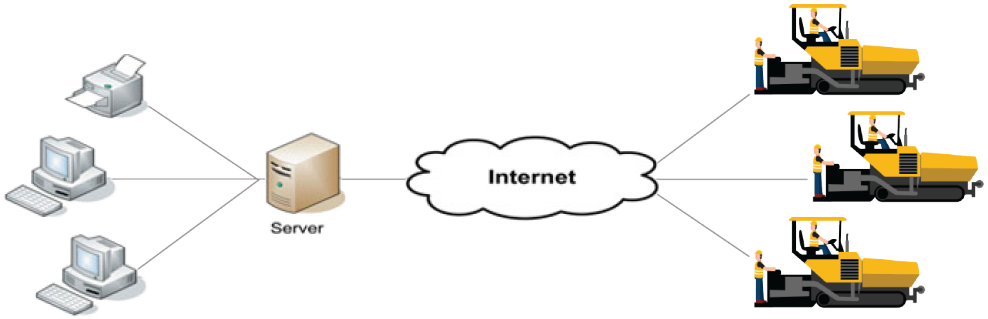
Save material cost	**Save money on material! Identify over consumption before it is too late**
Good paving practice	**Troubleshoot paving quality problems/ bad practice by reviewing the history of paving parameters**
Reporting	**Extensive reporting of paving jobs. Get full job overview using the MatWiser online interface**
Link job to map	**Geographical positioning of paving job as well as individual loads of material**
Machine efficiency	**Are your paver working throughout the day? If not, why?**
Historical data	**Use historical data as basis for future research to look for correlation between problem areas**

Transferring Data to the MatWiser™ Server

Transfer data via USB stick



Transfer data via GSM Data Transfer Module (not applicable for all countries)



MatWiser Subscription Plans

MatWiser Free

- Display data – see entire job
- Material usage overview
- Online view only (no reports)
- Data storage in 14 days

Free of charge

MatWiser Standard

Functions from MatWiser Free

+ Analytics
+ Activity overview
+ Screed width graph
+ Advanced map view
+ Data filtering
+ Map includes stop positions
+ Add comments to job
+ Real time data (heart beats)
+ Print reports
+ Unlimited data storage
+ Truck Management Light (GSM required)

Krever abonnement

+

MatScanner module

- Upload IR data
- Heat map view
- Calculate “Risikoareal”
- Export data to CSV
- Print report

Krever abonnement

+

High Precision GNNS

Assisted GNSS (L-band)
Sub-decimeter precision

Atlas subscription fee

+

Mobile data transfer

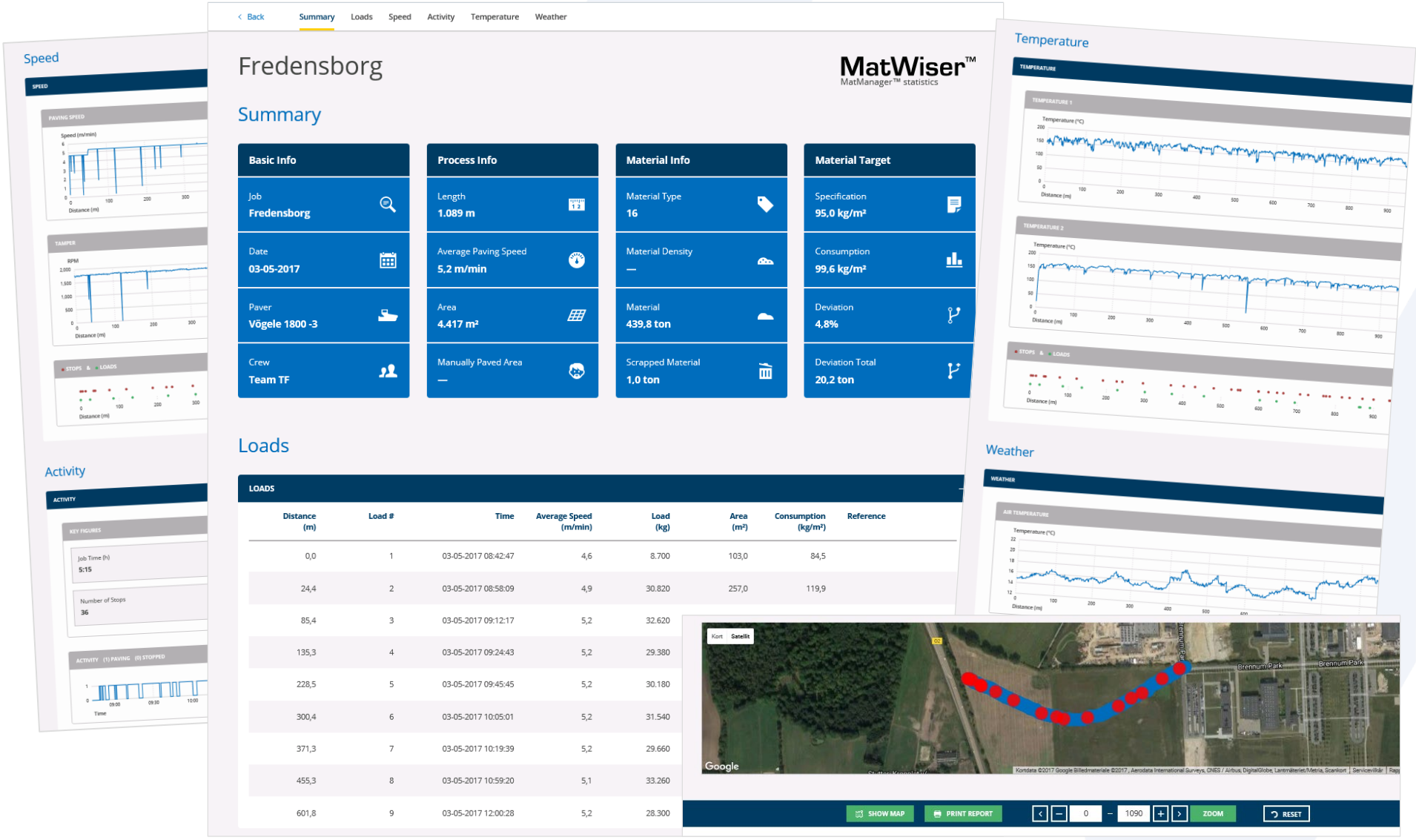
GSM transfer to MatWiser
Flat-rate data plan

Krever abonnement

All subscriptions are charged annually

TECHNOLOGIES
PAVING INNOVATION

MatWiser™ Server for Extensive Review and Reporting



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PAVING INNOVATION

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