

# Autonomous baggage tractor displays its capabilities

In December, *Airside International* was at France's Toulouse-Blagnac Airport to witness the first public demonstration of the AUTONOM TRACT AT135 autonomous baggage handling unit, based on GSE supplier Charlotte Manutention's T135 baggage tractor. The five partners in the programme – Charlotte Autonom, Air France, Toulouse-Blagnac Airport, TCR and G3S – were also on hand to offer their thoughts to the assembled media

The live demonstration of the still-in-development autonomous baggage tractor at Toulouse-Blagnac last year followed some weeks of testing at the south-western France gateway. These trials have continued into 2020, but the demonstration in December reflected how far the partners have come with the unit, which is designed to “improve baggage flow performance and ramp safety at airport hubs”.

The AT135 is being marketed under the auspices of Charlotte Autonom, a joint venture of GSE supplier Charlotte Manutention and French autonomous driving systems specialist NAVYA, but development has taken place in collaboration with not only Toulouse-Blagnac Airport but also French flag-carrier Air France, French ground handler Groupe 3S (G3S) and Belgium-based GSE leasing and maintenance specialist TCR.

AUTONOM TRACT has been seen before. The project dates back to Autumn 2018 when NAVYA and Charlotte Manutention announced they would create a subsidiary to develop autonomous tractor solutions, particularly for moving baggage at airports. However, it had only been publicly seen prior to the December demonstration as a stationary unit, so that event represented a significant step forward.

Charlotte Manutention's T135 baggage tractor has a proud history. There are

thought to be more than 12,000 T135s in operation around the world, so the basic platform is certainly sound. NAVYA brings its expertise in autonomous driving, especially its expertise in the software required for safe and efficient autonomous vehicle control.

In fact, about 130 NAVYA autonomous shuttles are currently in service at locations as varied as university

**“The autonomous baggage tractor could be a breakthrough in terms of technology on the ramp”**

**Jan De Leeuw,**  
TCR



The Charlotte Autonom autonomous tractor being demonstrated at Toulouse-Blagnac Airport

campuses, city centres and business parks, informs Diego Isaac, head of marketing at Charlotte Autonom.

### Origins

Bastien Devaux, Charlotte Autonom's managing director, takes up the story. He recalls that much of the driving force of the AT135 programme came from Air France, which – having taken a glimpse into the ramp of the future – wanted to investigate the potential of autonomous vehicles playing a role in its aircraft turnarounds.

Joining the programme alongside Toulouse-Blagnac Airport, which has always been a 'pioneer' in terms of introducing new technologies, he says, was G3S, which handles many Air France flights, while TCR added its expertise in GSE operation, development and maintenance.

The operational trials that, at the time of the demonstration in early December, had been running for a couple of weeks and

were to continue until the end of the year prior to a further phase of trials expected to begin in 2020, had benefited from the input of all these partners, says Devaux, and this was evident in the successful demonstration.

That took the form of an AT135 driving autonomously up to the stand from its parking station (following a pre-programmed course as set by a G3S handler).

The autonomous vehicle does not actually go right onto the aircraft stand: it stops just off the gate area and sounds a horn to alert a relevant nearby operator that the unit has arrived and is ready for further deployment.

The operator then sits in the cabin and turns the unit over to manual control. He/she drives the AT135 up to the aircraft, where a baggage loader can be fitted and bags then taken from the aircraft (or put into the hold, of course, in the case of a departing aircraft).

The process is reversed once bag transfer is completed. The operator drives the AT135 to the appropriate spot just off-stand and then, getting out of the vehicle, switches the unit to its autonomous configuration. The vehicle drives itself away to the baggage hall.

As shown when serving the Air France A321 at Toulouse during the demonstration, the vehicle in its autonomous driving mode can slow or stop when other GSE traffic represents a potential interference, and also comes to a halt on any stop lines on the apron.

So, how does it work? The unit is pre-programmed with a map of the apron and knows where it is on the ramp at any given moment through GPS technology. Cameras and Light Detection and Ranging (better known as LIDAR) offer 360-degree vision around the vehicle, providing data to the vehicle's control system as to potential hazards, while GPS and an odometer that measures the distance the unit has travelled constantly feed the

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control system relevant information. The vehicle also interacts with traffic signals on the apron.

The autonomous driving concept has been proven, Devaux remarks, and not only with the AT135. NAVYA's autonomous shuttles have already been demonstrating for some time that efficient and safe autonomous driving is perfectly possible in a wide range of locations and working environments.

Although further testing on-airport is still needed for the AT135, to introduce it to different airport aprons and to different weather conditions, Devaux is very confident of its future applicability to ramp operations. The unit has already gone through hundreds of hours of testing, he points out, and different weather conditions have not caused any problems.

Because it employs a range of sensors and systems to discern and assess the area around it, the AT135 is not dependent on just one sensor type that might fail in certain weathers, Devaux notes. Yet, as a precaution, if the control system senses that it does not have the necessary information to proceed safely, it will come to a stop.

#### TCR expertise

TCR has been offering its experience and expertise to the AT135's development and trials. It has its own operation at Toulouse

and has looked after the day-to-day maintenance of the unit, informs Thierry Mortureux, who is responsible for the Grand-Ouest region of France for TCR.

TCR has been collaborating with Charlotte on this programme since the beginning of 2019. It has provided input in regards to all sorts of aspects of the testing programme, says Mortureux, including but not limited to helping to define requirements the tractor should meet, technical specifications and development, the path that the AT135 ought to take between baggage hall and aircraft stands, and even the branding on the demo unit, as well as everyday maintenance.

With regard to the unit's requirements, "We see and talk to a lot of [GSE]"

customers and we see the potential for technological innovation such as this," says Jan De Leeuw, group commercial director for TCR, who is also the company's regional director for Belgium, the UK, Ireland, France and Italy.

He continues: "From our experience, the autonomous baggage tractor could be a breakthrough in terms of technology on the ramp." TCR is, De Leeuw emphasises, more than happy to invest in adding this sort of capability to the GSE fleets that it offers its customers, though of course there is always some risk involved with such ventures.

Certainly TCR's customers have been asking for this kind of technology, he confirms. Big airlines operating through



At the press conference, Charlotte Autonom managing director Bastien Devaux is in the middle

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**Vincent Euzeby,**  
Air France





big hub airports (such as Air France) tend to be particularly keen – it is at the major gateways that the most significant cost savings might be realised in terms of autonomous operations. Another benefit might be seen in terms of safer driving, leading to less damage to GSE on the ramp, a significant consideration for those who operate large fleets of GSE.

Further testing at Toulouse is likely to be complemented by trials at other locations. There are ongoing negotiations with AENA, the Spanish national airport operator, to see if one or more Spanish gateways might act as test sites. Medium-sized, busy gateways would be ideal, as opposed to the likes of Madrid or Barcelona.

Of course, customers need to buy into the new technologies, while all sorts of regulatory requirements must be met (at the airport, local and national level) for any autonomous driving system such as this to go live on the ramp.

Air France and Toulouse-Blagnac Airport have also indicated their satisfaction

with the progress made on the vehicle. Says Vincent Euzeby, head of IT and tech innovation at Air France: “By facilitating the use of an autonomous baggage tractor and perfectly integrating it into its operational processes, Air France’s ambition is to further optimise its operational performance and improve its customers’ travel experience. This test is the first step towards a more widespread roll-out of autonomous vehicles at our airports.”

And Philippe Crébassa, chairman of the executive board of Toulouse-Blagnac, adds: “This test is a concrete step towards designing the Smart Airport, [which will be] more innovative, connected and more efficient for our customers. It was only natural that this world first took place at Toulouse airport, the pioneer city of aviation.”

There are many obstacles and hurdles to overcome, but surely implementation of this sort of technology on the ramp cannot be too far away, given its potential benefits.

## “A concrete step towards designing the Smart Airport”

**Philippe Crébassa,**  
Toulouse-Blagnac Airport

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