einride

Abstract: 10th International Workshop on Sustainable Road Freight, 4th-5th December 2023

Title: The future of freight transport is digital, electric and autonomous

Climate change is the most important challenge we face today. Humanity has an endless capacity for creativity, but in many areas we remain resistant to change. The road freight industry accounts for 7 percent of global CO2 emissions, consuming over 5 million barrels of oil per year. Einride was founded in 2016 as a dream, one based on the conviction that the age of autonomy and electrification gives us the opportunity to create a more desirable version of the future, one that is aligned with human-centric values and the ecological necessities of our planet. With electric and autonomous transport as well as an intelligent freight mobility platform, we can change road freight for good.

Einride is a Swedish technology company that develops and provides freight mobility solutions based on electric and autonomous vehicles, leading the transition to sustainable transport. Einride's connected electric trucks and charging solutions, intelligently coordinated by Einride Saga, allows shippers and carriers to go fully electric now.

Einride became the world's first company to operate an autonomous, all-electric freight vehicle on a commercial route on a public road in 2019. Today, Einride operates one of the largest 100% electric fleets of trucks in Europe with major multinational partners, including Lidl, Oatly, Electrolux, Ahlsell, and SKF. In addition to its presence in the Nordics, Einride has launched in the U.S., Germany, Belgium, Netherlands and the UK. Einride's first commercial partner in the UK is PepsiCo. Goods will be transported between its Walkers manufacturing sites in Leicester and Coventry using Einride connected electric trucks, with the operations powered by the intelligent freight mobility platform Einride Saga. This initial deployment alone is expected to curb 1,623 tonnes of CO2 emissions across three years.

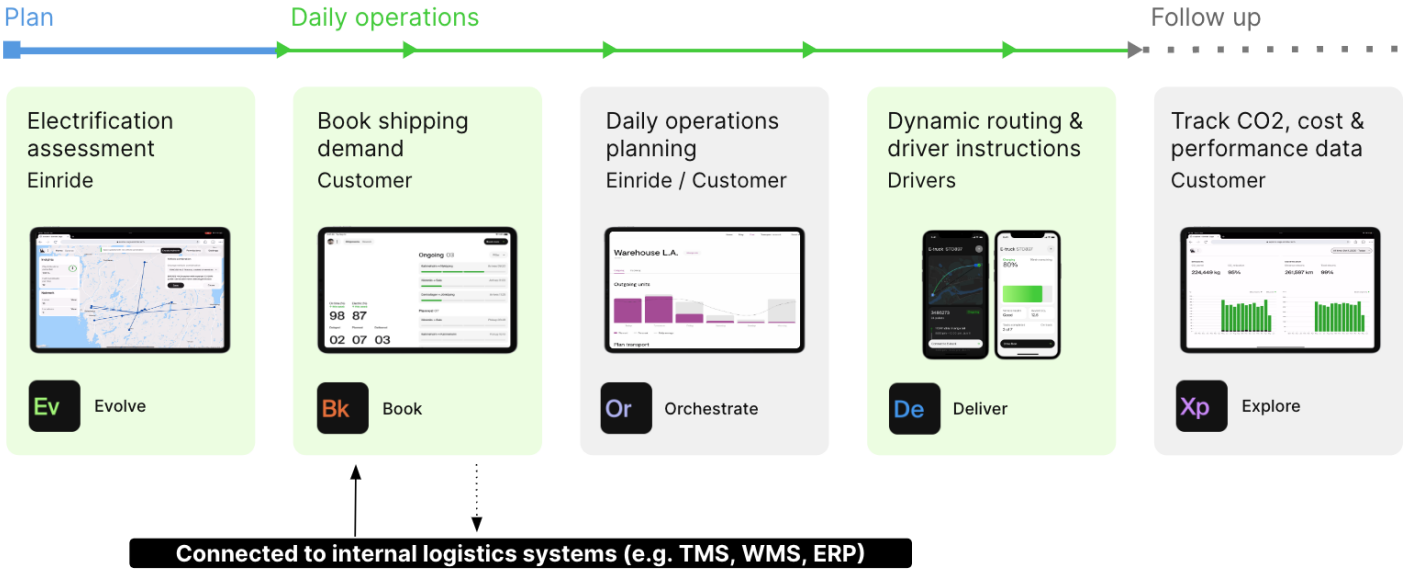
Figure 1: Einride's offer

Einride deploys a first-in-industry, unique and proven electric freight business model that brings shippers, operators, vehicles, and charging infrastructure together to orchestrate and harmonise electric freight transport whilst increasing overall system efficiency. Einride Saga is the brain of both the electric and autonomous freight ecosystem that interconnects shippers, operators, service partners and charging infrastructure. The platform ensures planning is

optimised across shippers and all operators throughout the transport network. Through a proven data driven strategy to target immediate electrification sweet spots, Einride delivers cost competitiveness already today.

Without an intelligent, interconnected ecosystem working behind the scenes to optimize the transition, switching to an electric and autonomous fleet will be nearly impossible. Einride Saga allows shippers and carriers to offer faster, greener, and cheaper freight. Through digitalization we are able to deliver better experiences and build sustainable relationships for our customers.

Figure 2: Einride Saga

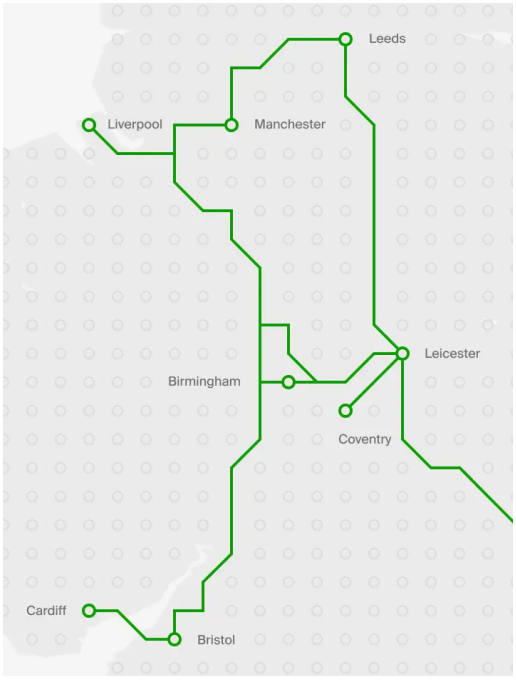


By substituting electricity for diesel freight, associated CO2 emissions can be reduced by up to 90% at the source. We can also eliminate NOx and other air pollutants that are harmful to public health, especially in condensed urban areas. As an added bonus, electric transport results in an overall cost reduction when implemented and coordinated at scale by our platform.

Autonomous vehicles are the future of transportation. Einride's autonomous vehicles currently operate on public roads and at customer sites in Sweden with remote oversight and drive capability. To manage the transition to full autonomy, Einride developed a proprietary five-step framework. Level 1 and 2 require limited regulatory oversight and represent highly controllable environments such as fenced facilities or nearby deliveries on public roads, while level 5 represents dense and complex urban environments.

Einride grids are based around a network of green corridors and represent a long-term concept that will unlock a resilient and cost-effective way to transport goods across the country. With the digital, all-electric, and autonomous movement of goods, Einride enables unprecedented efficiency while reducing emissions. The grids are physical and digital infrastructure in symphony. It allows for multiple Einride clients to ship within the same geographical ecosystem, streamlining electrification and unlocking greater value

Figure 3: Einride grids in the UK



with increased density. Einride is deploying grids around the world, enabling shippers to electrify intelligently at scale.

Einride's transport solutions offer 95% CO_2 reduction compared to diesel and 99.5% of deliveries are on time. Since the start, Einride's electric trucks have driven 2 506 761 km. This implies a total of 1 914 414 kg CO2 reduction of emission compared to driving with diesel.

During the International Workshop on Sustainable Road Freight, Einride would like to showcase how decarbonisation of the road freight transport sector is possible already today through digitalisation, electrification and automation.