

# TRACKAXLE

## Trackaxle's Ground-breaking Self-steering Carriage System Powered by 3D Design Solution



### → THE CLIENT

Trackaxle Pty Ltd, a Victorian engineering company, is a small-to-medium size engineering firm based in Shepparton, Victoria. It all started with a sketch on the back of an envelope and a conversation between Kerry Atley and Peter Gaylard. Their objective was to develop and market a ground breaking trailer using much less road space to corner, through the means of an innovative self-steering carriage system design. From this simple beginning evolved something revolutionary; they formed Trackaxle.



### → THE CHALLENGE

Trackaxle's first prototype trailer was developed the hard way, through trial and error. The challenge for the company was to develop a more sophisticated and complex product using 3D modeling technology. They needed a design solution with integrated performance and strength analysis allowing for design optimization, as well as the ability to create virtual prototypes simulating the entire range of motion for each component.

### → DESIRED OUTCOME

The company's long term vision was to create a safer and less intrusive road freight transport system. This new system needed to provide significant productivity benefits, reduce operating costs, and reduce environmental impacts of semi-trailer operations.

### → THE SOLUTION

IMAGINiT Technologies introduced Autodesk Inventor to Trackaxle's Engineering Manager, Bernie Alderton. Bernie did not have any experience with the design capabilities of Inventor, prior to speaking with IMAGINiT. Through IMAGINiT's support team, he was able to develop the skills needed to realize the design of the steering system. "When we discovered Autodesk® Inventor 11, our approach to research and development completely changed," said Kerry.

### → ACTUAL RESULTS

"We aspired to develop a new, unique drive system to give constant four-wheel drive through a split rotating transfer box with a differential to split rotating bevel boxes. It needed to be compact and strong," said Kerry. Using input data from a gear designer, Bernie designed the transfer box in Inventor 11. While creating the transfer box, he realized that the design would not work and that the ratios needed to be modified for the gears to operate properly. Inventor helped them take care of the problems in the conceptual design stage, avoiding expensive rework later in the manufacturing phase. "Inventor saved us from costly errors, allowed us to carry out procedures which would otherwise have been outsourced to expensive consultants, and took us from the back of an envelope to a working design we were confident would work," concluded Kerry.

Trackaxle is an invention that generates benefits for all transport players. The Trackaxle Trailer has a patented self-steering rear carriage, which, due to its self-steering mechanism, saves on tire wear, provides fuel efficiencies, and improves overall semi-trailer safety. The trailer presents opportunities for performance-based standards to contribute enormous gains in transport productivity, reduce traffic congestion, pollution, and road damage caused by semi-trailers.

Collaboration with IMAGINiT and the use of Inventor, gave Trackaxle the competitive advantage by providing tools to innovate, visualize, and realize their idea, steering them in a revolutionary direction.