



## Global Support and Training Overcome Design Challenges



*"COOL in Chinese means intelligence, someone who is able to read between the lines, to foresee events and therefore take the necessary and appropriate actions." This is the mission of COOL Mobility®.*

### → THE CLIENT

COOL Mobility® Pty Ltd ([www.coolmobility.com.au](http://www.coolmobility.com.au)) co-founder, Colin Johanson, a quadriplegic himself, believes mobility aids should be attractive, as light as possible, and use the most advanced technology, to obtain optimum performance for the human technology combination. As a co-ordinator at Kangan Batman Institute of TAFE (Technical and Further Education), Colin with engineering students and staff developed the Kangaroo (Kangan Roo) Power Wheelchair.

### → THE CHALLENGE

Like the Australian kangaroo, the Kangan Roo has five points of contact with the ground. It is built of aluminium, stainless steel, composites, and titanium. The frame design allows the chair to be adjusted for tight indoor manoeuvring or outdoor cruising (speeds of up to 10 km/h). Creating the 3D pipe designs within AutoCAD® was challenging, and required finding 3D pipe lisp routines and add-ons. Additional challenges were discovered when Colin visited the United States to collaborate with an education institute on the design. This global collaboration created design file compatibility issues.

### → DESIRED OUTCOME

It was essential that design data and drawings be shared with global design teams. They needed to import and work with designs from overseas collaborators who were not using Autodesk products as Colin's team upgraded to the latest Autodesk technology. The Kangan Roo design team was looking for an application that was specifically developed for 3D design. "I loved working in 3D in AutoCAD when it was first implemented but 3D in AutoCAD required a lot of planning," Colin explained.

### → THE SOLUTION

Autodesk® Inventor™ provided a natural progression to move from 2D and the limited 3D capabilities of AutoCAD to full design creation. The flexibility of Inventor was also beneficial. "Inventor allows sketching in 3D directly and developing in a full 3D environment. Being able to look at any angle at any time as well as the ability to apply stress analysis on the design, is essential" stated Colin.

Colin continued, "IMAGINiT training staff were very helpful during training and demos and tailored information so that I could visualise how the software could best work for us." IMAGINiT provided the TAFE, where Colin worked, with affordable student software to teach Inventor. IMAGINiT aided the Kangan Roo design team with individualised help rather than delivering standard sales information or canned training.

To help overcome the challenge of collaborating and sharing information globally, IMAGINiT helped to ensure that the design data from Inventor was easily shared with teams in the United States, who were not on an Autodesk platform. "The high level of support that we received from both the sales and support team helped greatly," confirmed Colin.

### → ACTUAL RESULTS

Using Inventor for the design immediately impressed the contractors tasked with building the prototypes, prompting the reaction from an engineer, "Everything worked so well. That is the first time I've built something from someone else's drawings that actually fitted together first time!"

Colin concludes, "With extra capabilities of Inventor with the translation of drawings from other CAD systems without needing to recreate from 2D drawing, we see as the greatest opportunity for huge gains."

Now on their third prototype, using rare earth magnet motors supplied by collaborators CATEA of Georgia Tech in Atlanta USA and NiMH batteries (the same as used in hybrid electric vehicles) supplied by sponsor Cobasys of Michigan USA, the chair is now closer than ever to being a widely available commercial product. In addition, their new design tools will now allow the ability to easily modify the design for children.