

Korea Bullet Train

Customer Success Story

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Any surface we imagine for the Korea Bullet Train's exterior or interior, we can create. I'm amazed by Autodesk Alias software. It gives us so much control over the design and lets us quickly make changes. For us, that is a real asset.

—Professor Sung Yong Kim
Design Department
School of Visual Arts
Korea National University of Arts

Speedy transport.

Designers create innovative concepts for the exciting new Korea Bullet Train.



Project Summary

Determined to develop a state-of-the-art, high-speed passenger train, the government of South Korea and KORAIL (Korea Railroad) asked industrial design professors at two renowned universities to leverage their transportation design expertise to design the next-generation model. The competition winner, a team of highly skilled professionals from the Korea National University of Arts in Seoul, relied on Autodesk® Alias® software to develop the new Korea Bullet Train's groundbreaking design.

The team's head designer, Professor Sung Yong Kim, used Autodesk Alias software to experiment with highly creative shapes for the train's exterior and interior elements while also meeting the stringent engineering requirements integral to the ambitious project. To help stakeholders clearly visualize the Korea Bullet Train, and to facilitate design reviews and support critical design decisions, Professor Kim and his team developed finely detailed renderings—including realistic environments and lighting—using Autodesk® Showcase® software.

With the help of Digital Prototyping software from Autodesk, the Korea Bullet Train design team has been able to:

- Create innovative designs for the train's interior and exterior
- Get buy-in from stakeholders on a very high-profile project
- Collaborate effectively with engineers to meet their requirements

The Challenge

South Korea's plans for the new bullet train are ambitious. While the current Korea Train eXpress (KTX) bullet train reaches 300 km/h, the new design could top 400 km/h. Attaining this goal requires a sophisticated design process. "There is a vast difference between 300 and 400 km/h," explains Professor Kim. "We needed much more sophisticated technology and very creative forms to meet this design and engineering challenge."

Now that the initial design for the Korea Bullet Train is complete, Professor Kim and a team of engineers must develop a working prototype that will undergo rigorous testing for several years before the train debuts in 2014. "Now, we are making adjustments to fine-tune the design," says Professor Kim. "It's very important that we designers cooperate closely with the engineers, so we can incorporate their feedback into the model for fabrication quickly and accurately."

With the help of Autodesk software, the Korea Bullet Train design team breaks new ground.

The Solution

Choosing Autodesk® Alias® Design software for the high-profile Korea Bullet Train project was simple for Professor Kim. Part of the Autodesk solution for Digital Prototyping and a standard in the transportation industry, Autodesk Alias software provides Kim and his team with a comprehensive set of visualization tools for the entire shape-definition process, from concept sketches through Class-A surfacing. "As an automotive industry veteran, I knew firsthand the power and capabilities of Autodesk Alias software," says Kim. "Alias software excels at very fine, sophisticated surfaces. It gives us freedom to create unique forms."

In fact, with Autodesk Alias software, Professor Kim can choose to use single-span Bezier geometry or multispans nonuniform B-spline (NURBS) geometry. And because Autodesk Alias software semi-automates routine tasks and simplifies complex ones, Kim and his team are able to adjust their designs easily and quickly.

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Visualizing Designs in 3D

To support design reviews, the design team imports skin data from Autodesk Alias software into Autodesk Showcase software. With Autodesk Showcase design visualization software, it's easy to provide stakeholders with multiple design alternatives—showing different colors and materials, for example—in a realistic and more accurate way.

"There are some tough decision-makers at KORAIL," says Professor Kim. "We use Showcase to create renderings that we review in regular meetings."

Sometimes, we will put the train into an environment, such as a train station, to provide an even more realistic view of the design."

Communicating designs using 3D imagery has sped the design review process, making it easier for everyone involved to clearly visualize the Korea Bullet Train's design as it evolves. Professor Kim explains, "It's easy to understand a Showcase rendering. It's a very effective communication tool. Autodesk Showcase software also allows us to create renderings much faster, so we can see the results of our design changes in near real time."

The team appreciates the seamless data exchange between Autodesk Alias, Autodesk Showcase software, and Autodesk® 3ds Max® Design, according to Professor Kim. After reviewers provide their input on a Showcase rendering of the Korea Bullet Train, the team makes any necessary adjustments to the Alias file. With very little effort, the team can quickly update the Showcase file to reflect the changes.

For more important reviews and presentations, the design team sends Autodesk Alias design files to a vendor that uses Autodesk 3ds Max Design to create animations. "Because this is a transportation project, it's important that we show the Korea Bullet Train as a moving object," says Professor Kim. "Animations greatly impress our stakeholders and therefore play a key role in our most critical design reviews."

The Result

With the help of Autodesk software, Professor Kim and his design team have successfully developed innovative designs for the Korea Bullet Train. Their designs included detailed interior components, such as passenger seating, which has impressed South Korean government and KORAIL stakeholders.



Autodesk Alias and Autodesk Showcase software have also helped the team to meet a rigorous project schedule. "Autodesk software saves us time and effort," concludes Professor Kim. "We can quickly iterate our designs to get it right. We are just a few people working very fast, but with the help of Autodesk software, we're making decisions quickly and communicating extremely well. Autodesk software has been indispensable on this very important project."

For More Information

To find out how Autodesk and Digital Prototyping can help you create industry-leading transportation, visit www.autodesk.com/commercial-recreational-transportation.



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