

Modular Interior Design Kit For Paris tram train

Siemens

Industry Sector Mobility Division

Oktober 2008

Design Benno Schiefer
Jörg Brandt

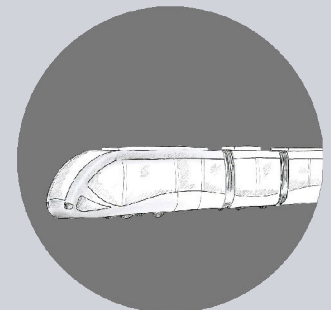
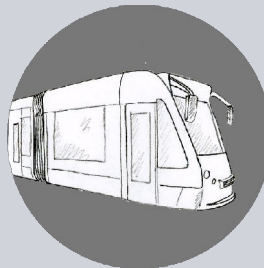
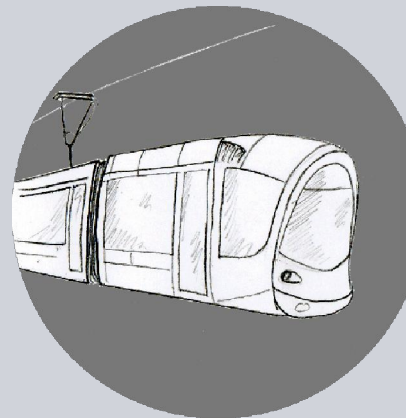
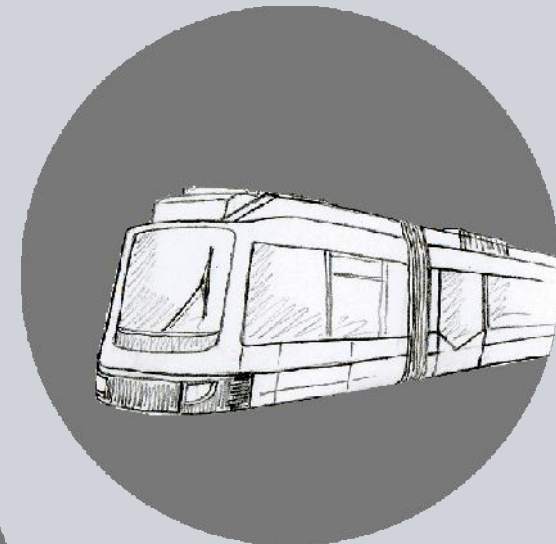
the challenge

the rolling stock market is meanwhile hotly contested ...



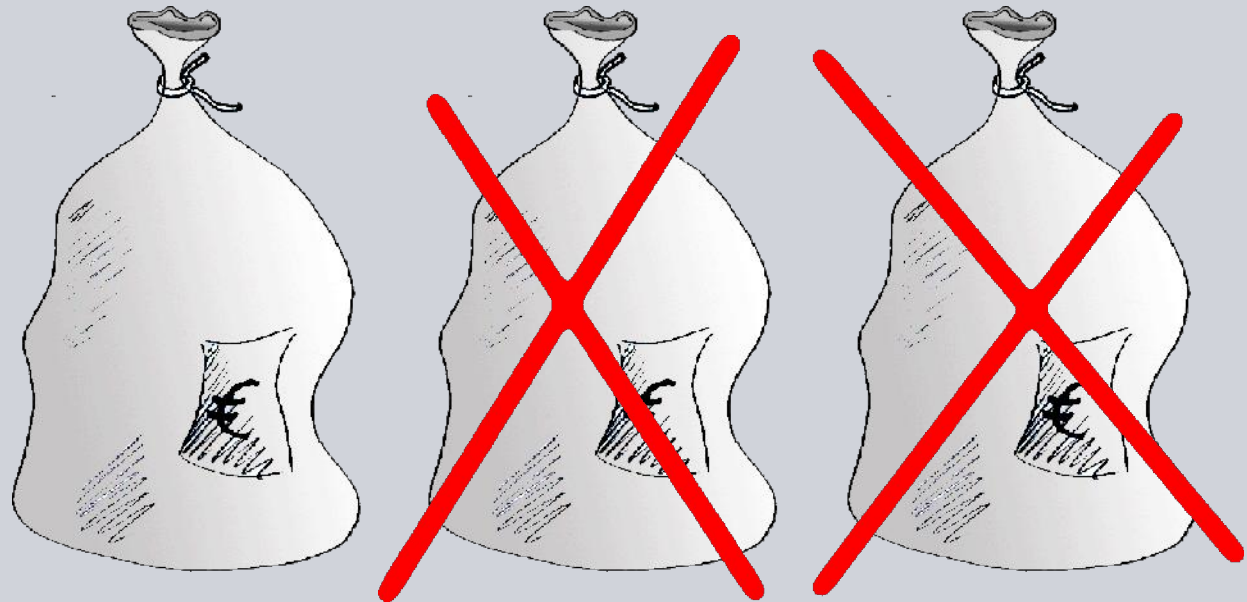
the challenge

... every customer wants to see his own individual design concept become reality ...



the challenge

.....and that at „low cost“ conditions



an apparently impossible endeavor

..... the answer

to develop a modular vehicle frame with variable interior components



design of a modular bodyshell

- modular handhold system (windscreens / boarding aids / stanchions / etc.)
- modular lighting
- modular door drive and ceiling paneling
- modular seating system



modifiable interior design

.....for the utmost in design flexibility.....

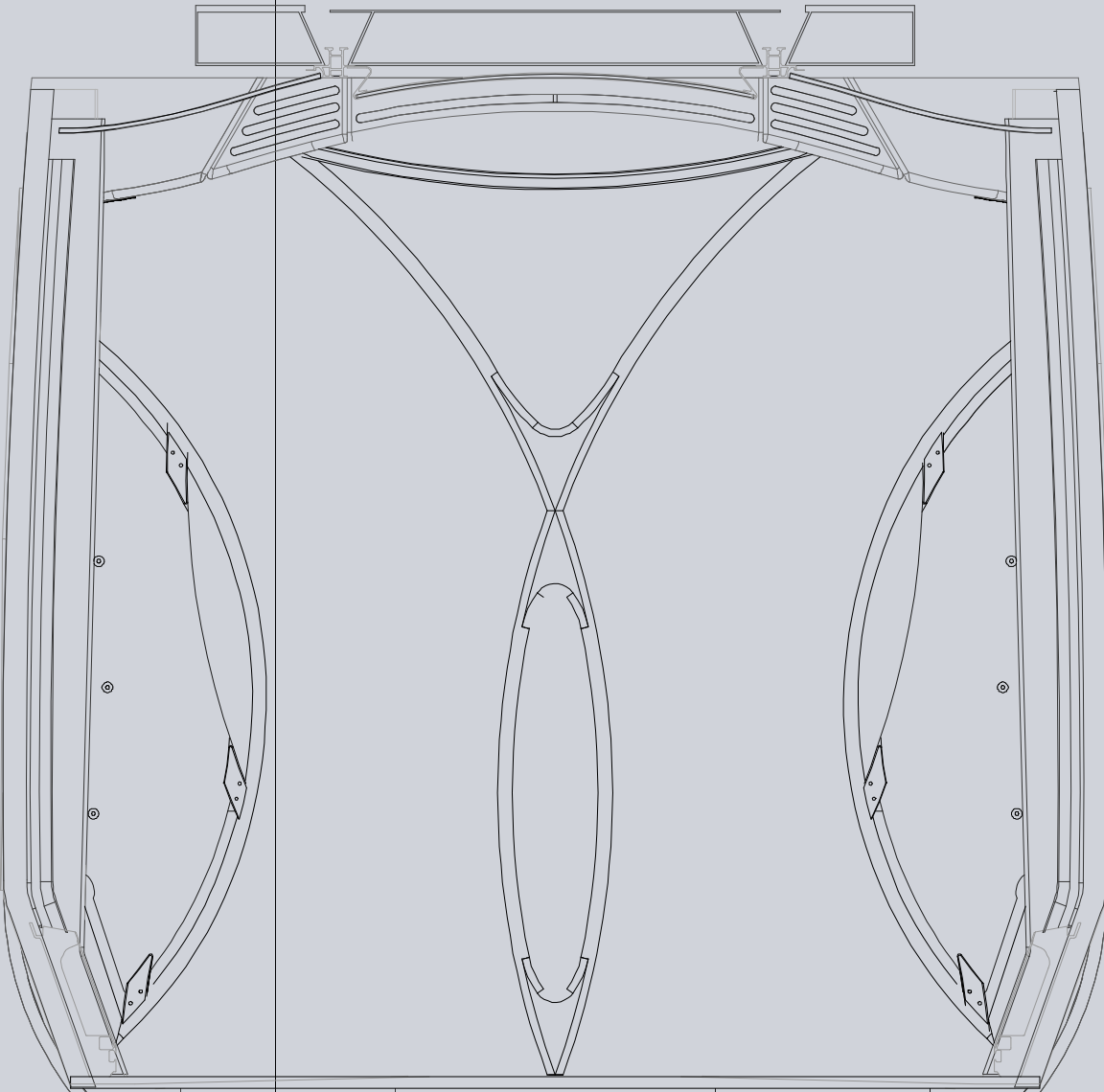


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



the following section explains the design grid, i.e. the formal matching of the built-in components in the vehicle cross section

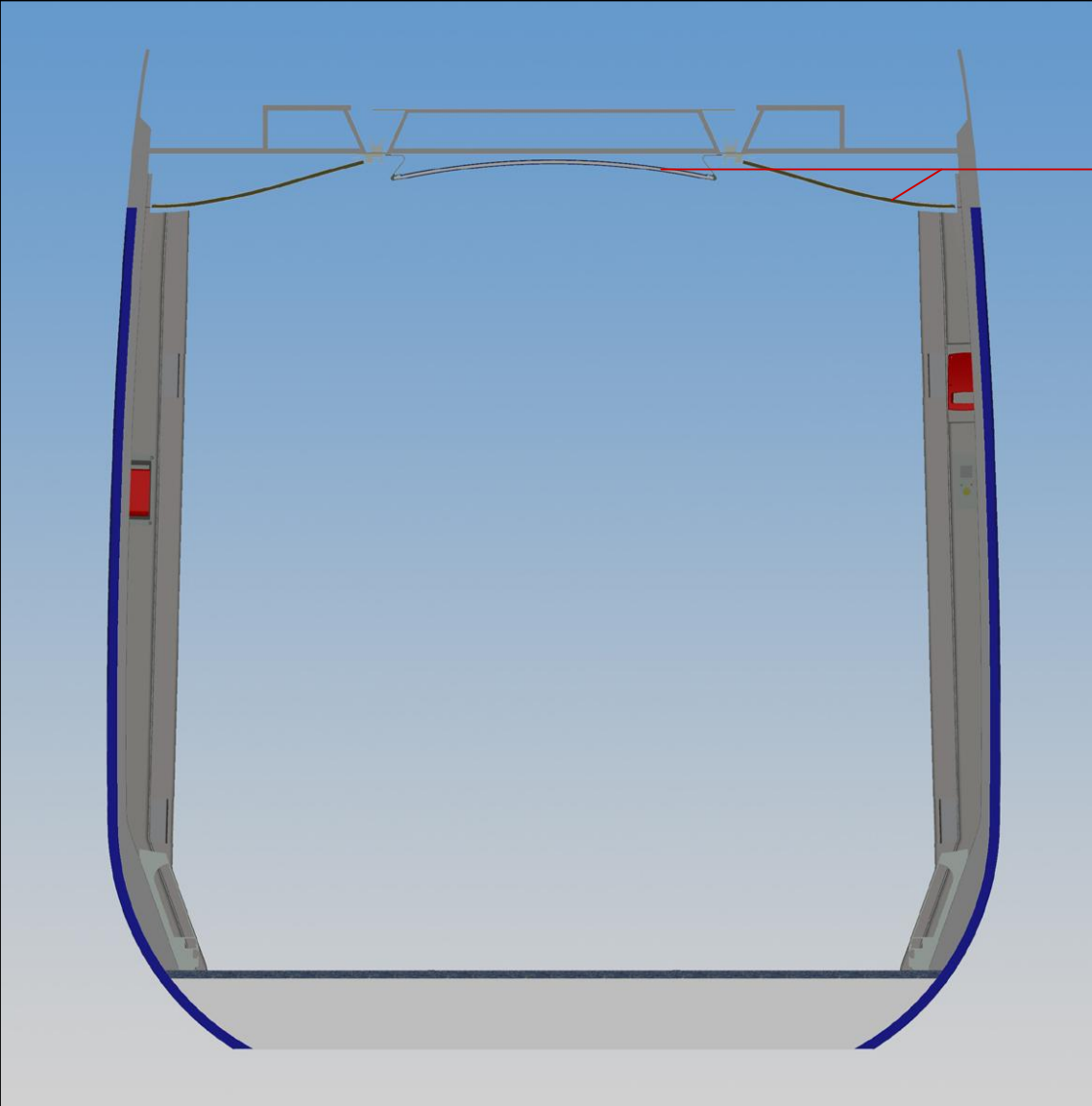
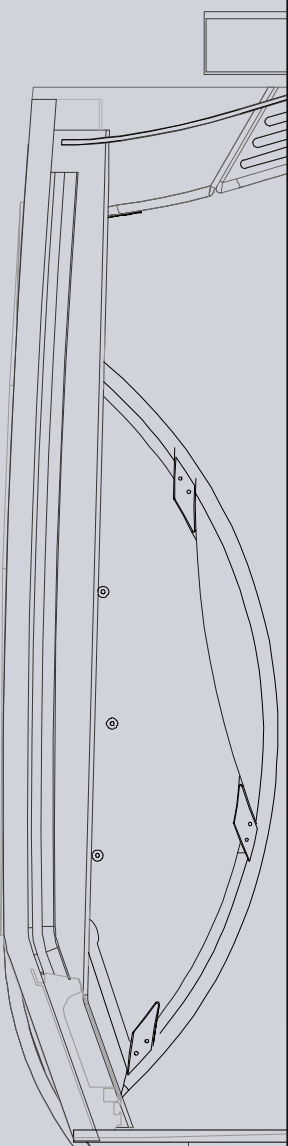


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

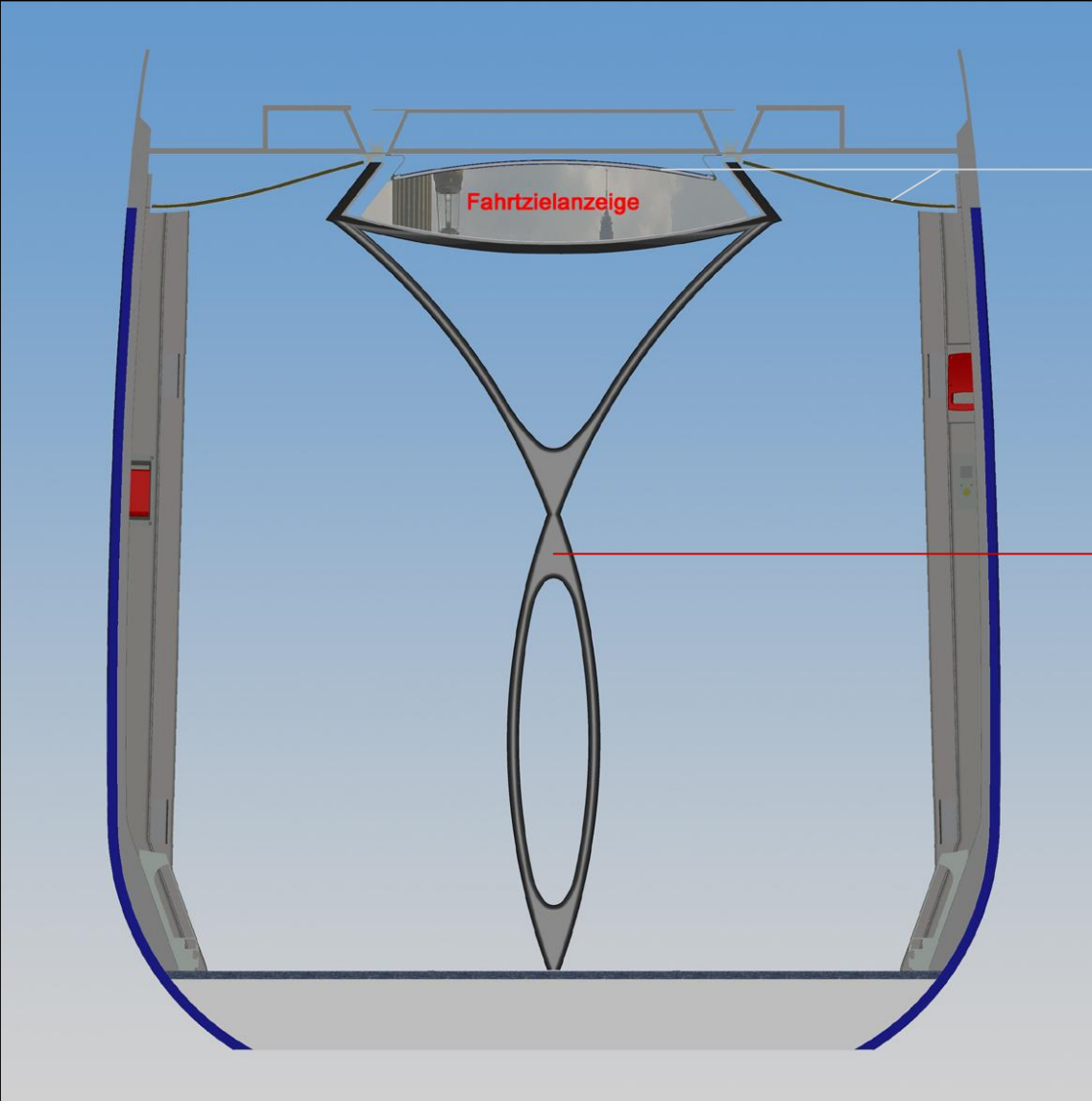
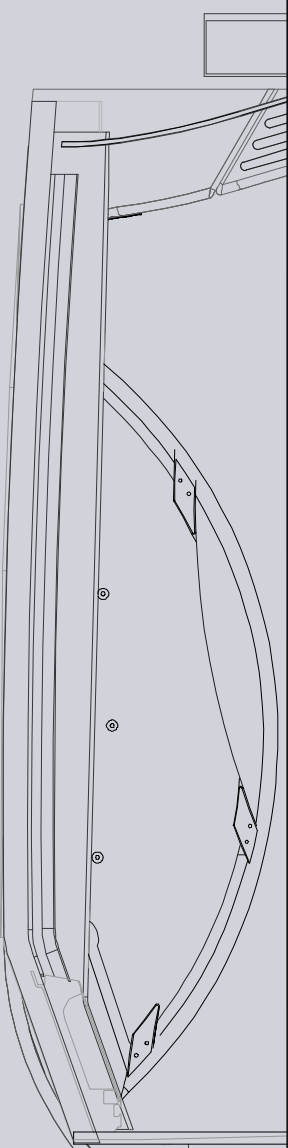


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

vertical stanchion

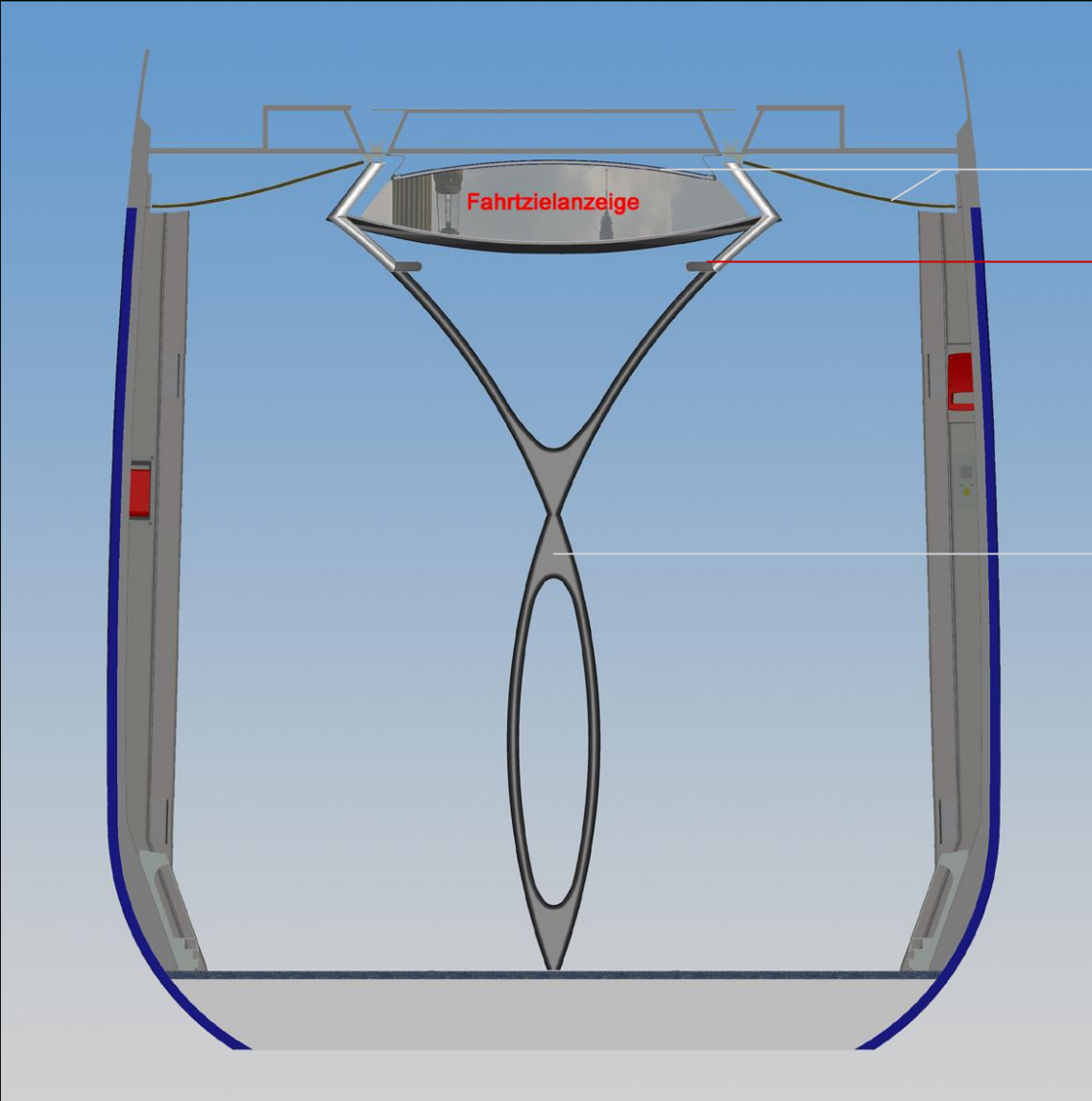
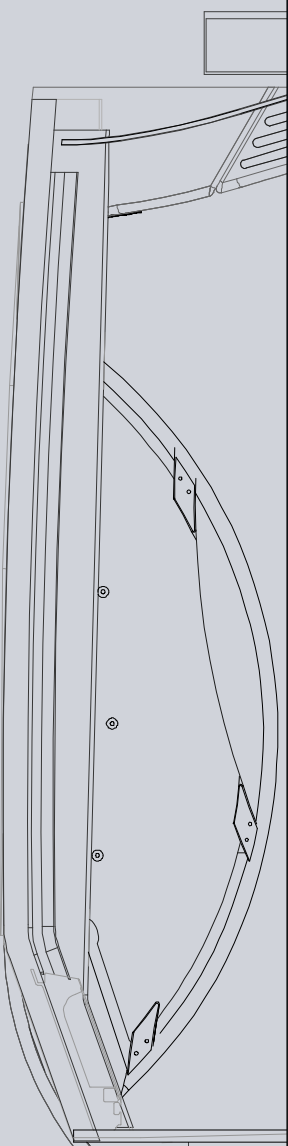


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

horizontal stanchion

vertical stanchion

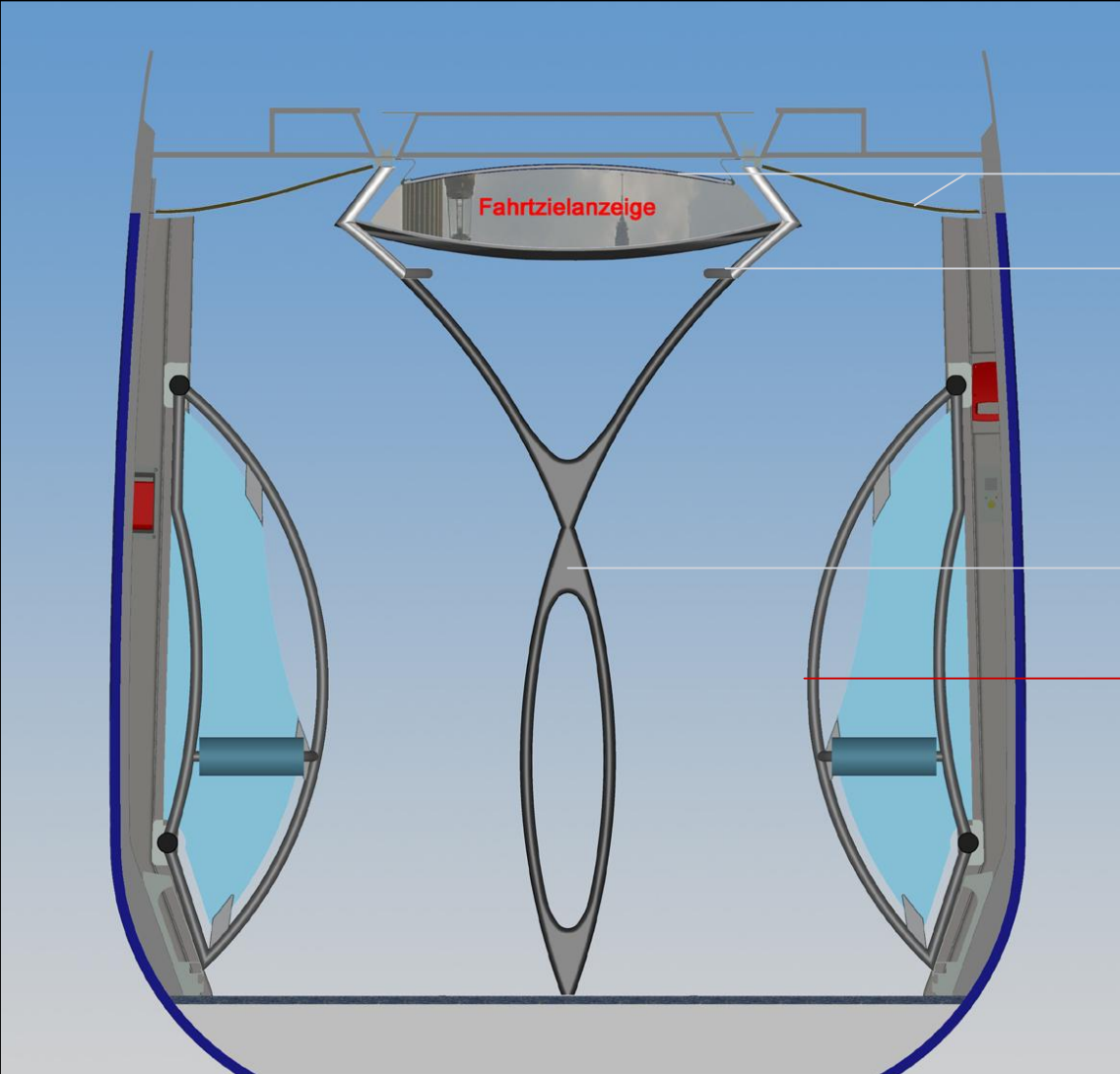
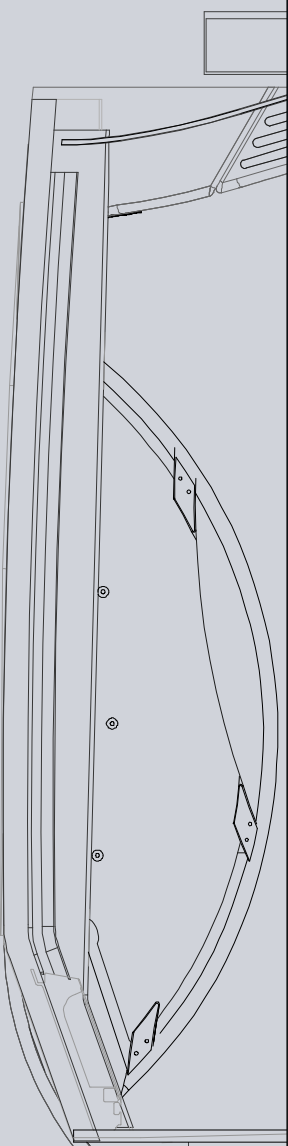


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

horizontal stanchion

vertical stanchion

windscreens

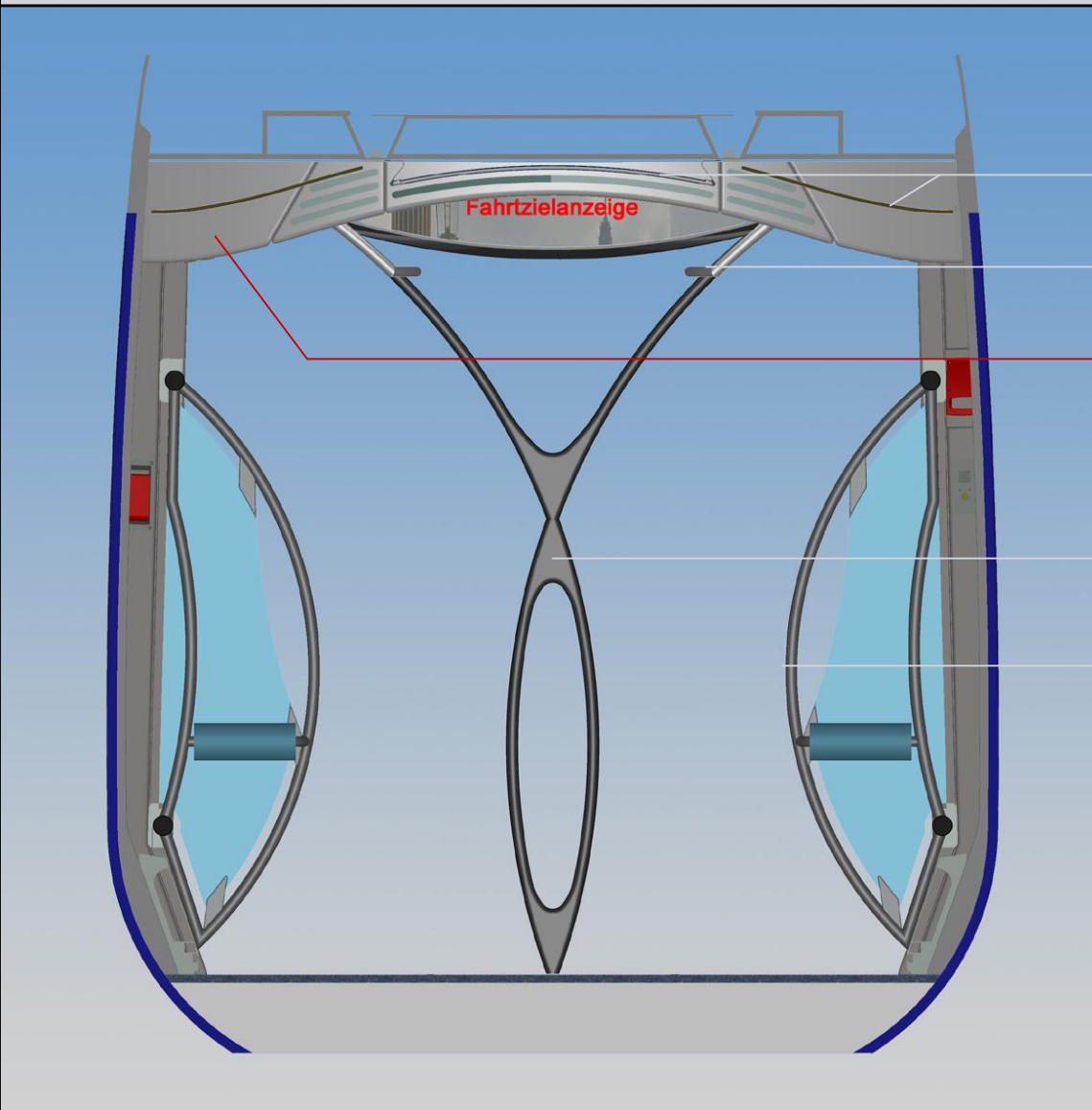
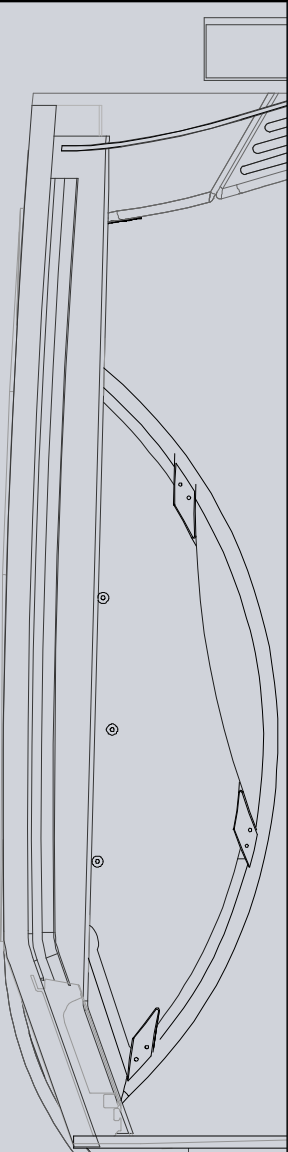


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

horizontal stanchion

door drive cladding

vertical stanchion

windcreens

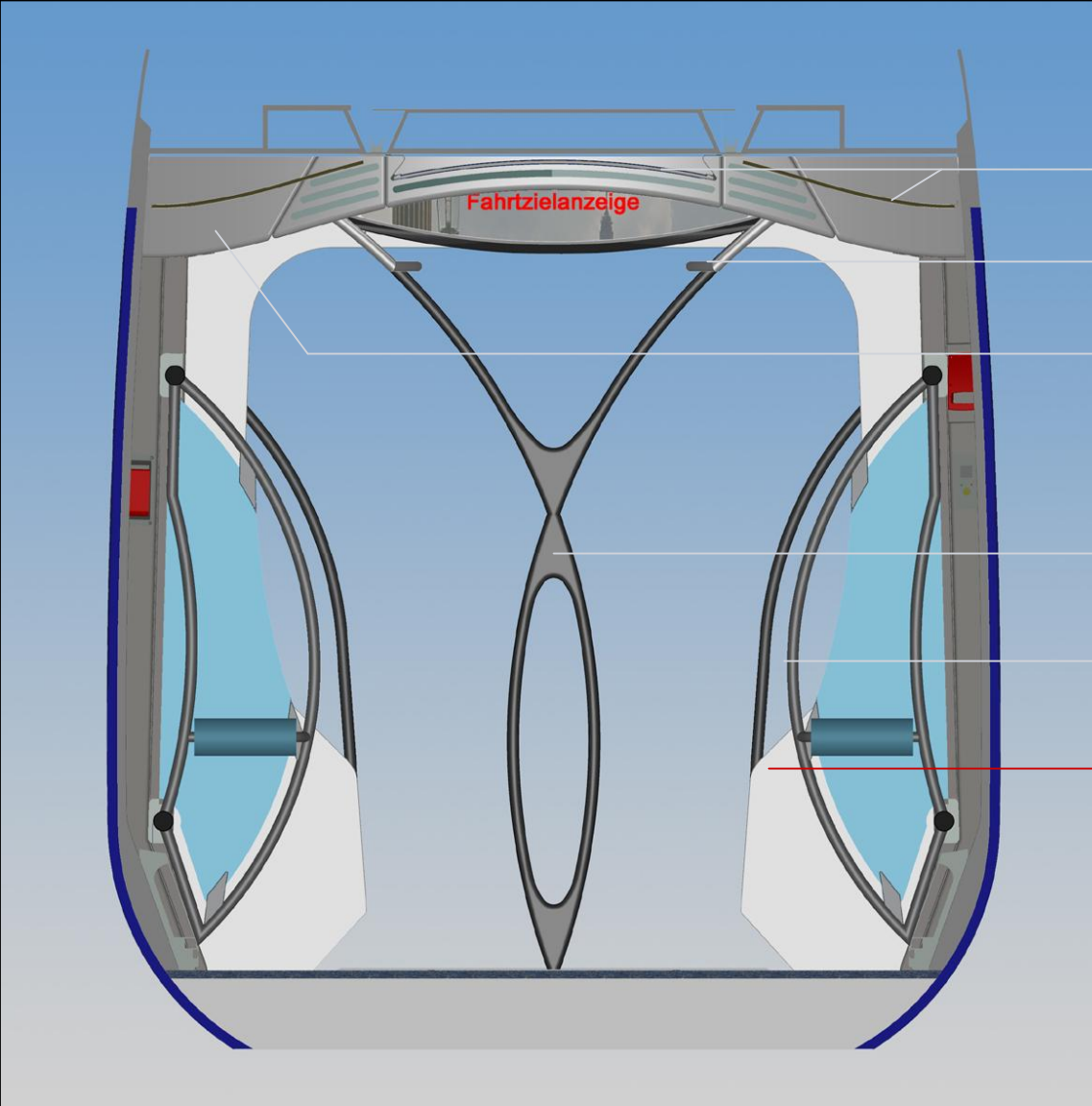
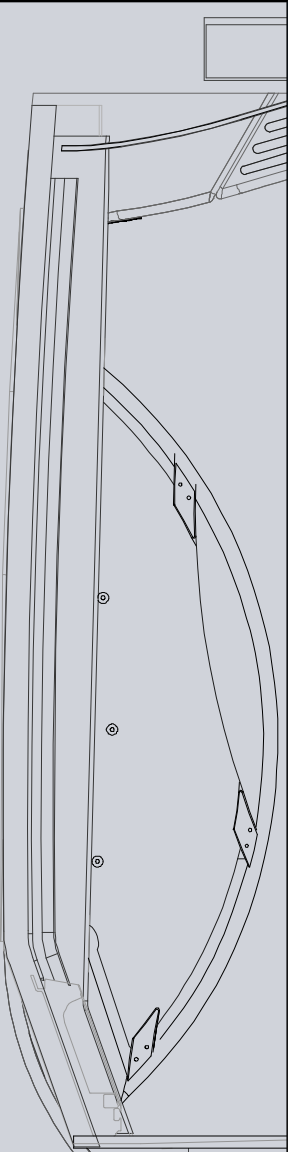


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

horizontal stanchion

door drive cladding

vertical stanchion

windscreens

front articulation portal

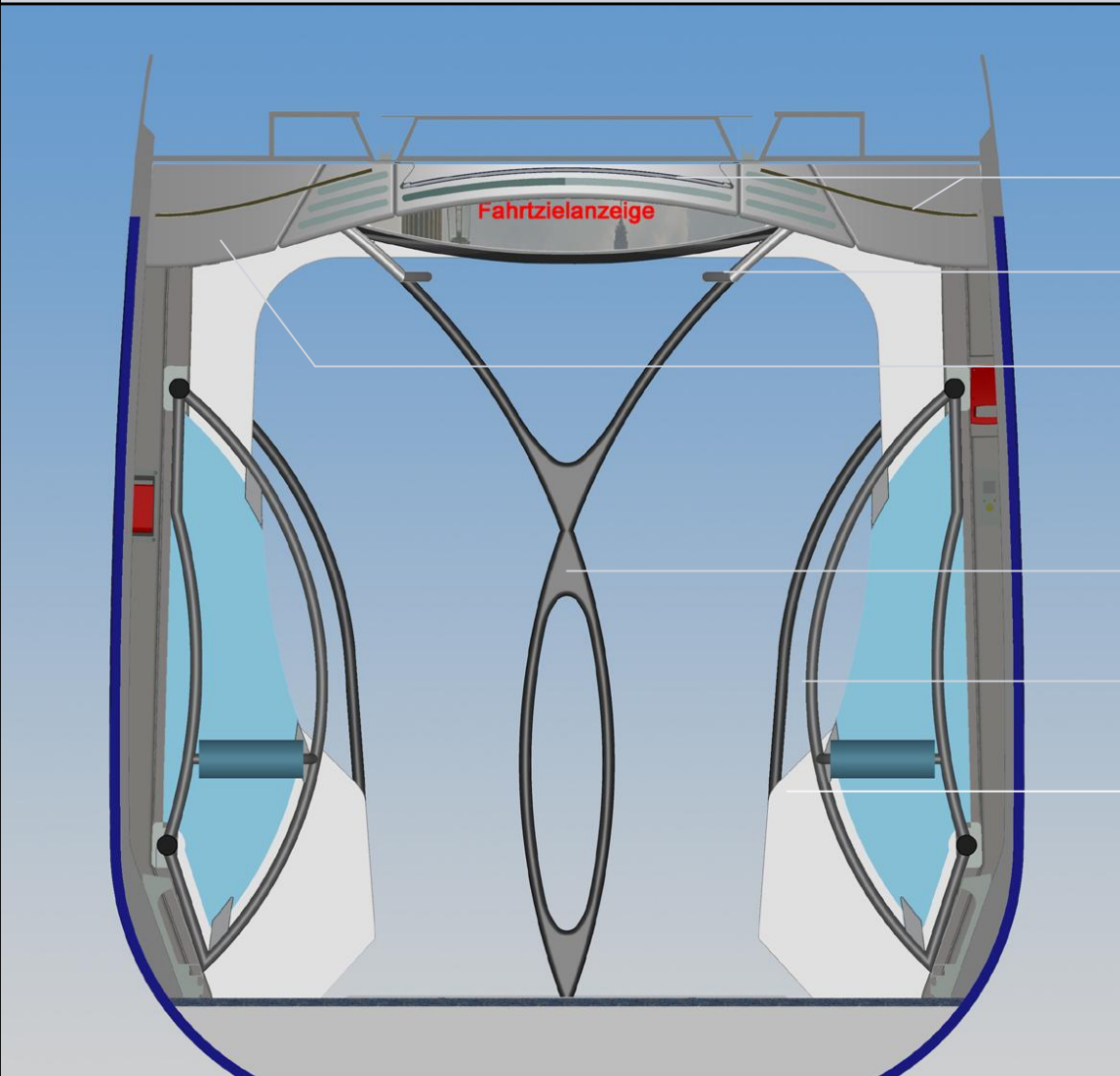
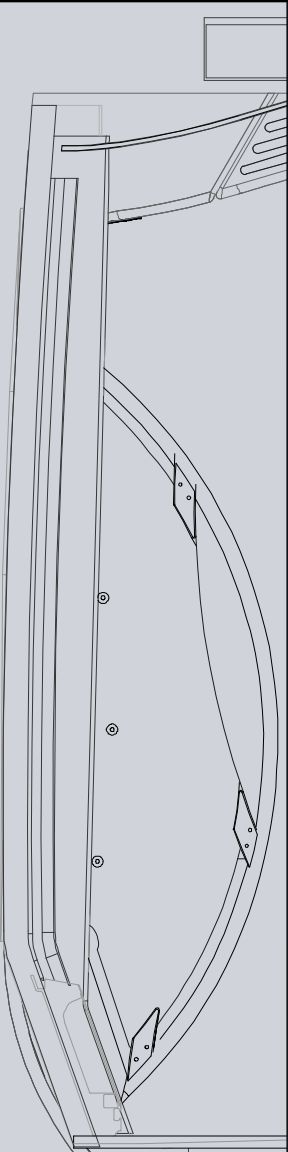


the concept ...

SIEMENS

design grid + built-in components

vehicle cross section



ceiling + coving

horizontal stanchion

door drive cladding

vertical stanchion

windcreens

front articulation portal

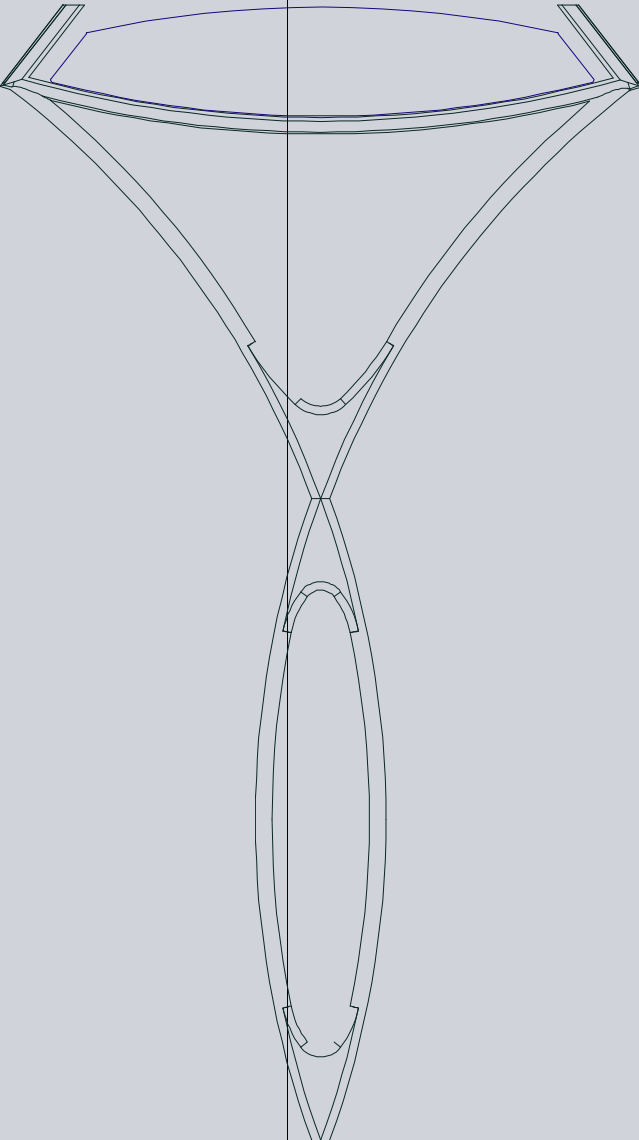


the concept ...

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modular design kit

central handholds



modular construction allows a variety of handhold designs to be used in the vehicle, both with and without integrated digital display panels

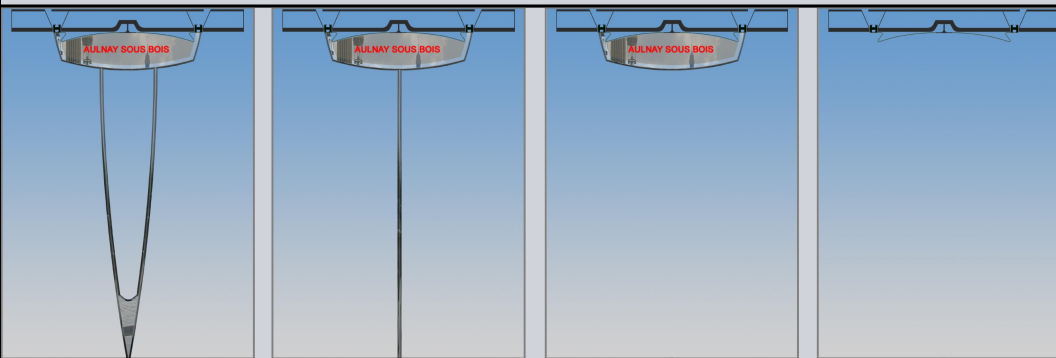


the concept ...

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modular design kit

central handholds

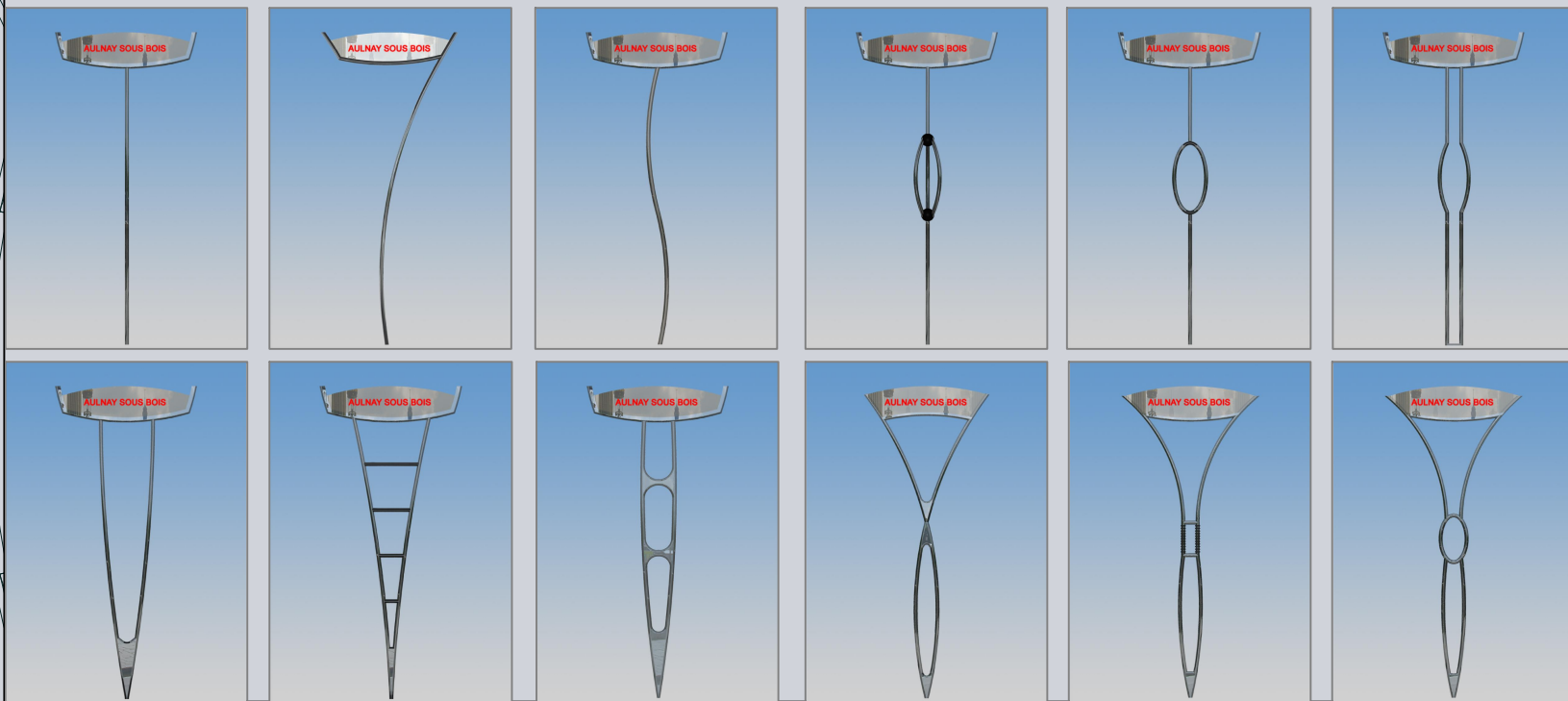


every vehicle is capable of being equipped with or without central handholds

every handhold can be fitted with or without dynamic destination indicators

every handhold can be replaced retroactively by any other type of handhold

just a few examples of different combinations and designs for integrating handholds in the car interior



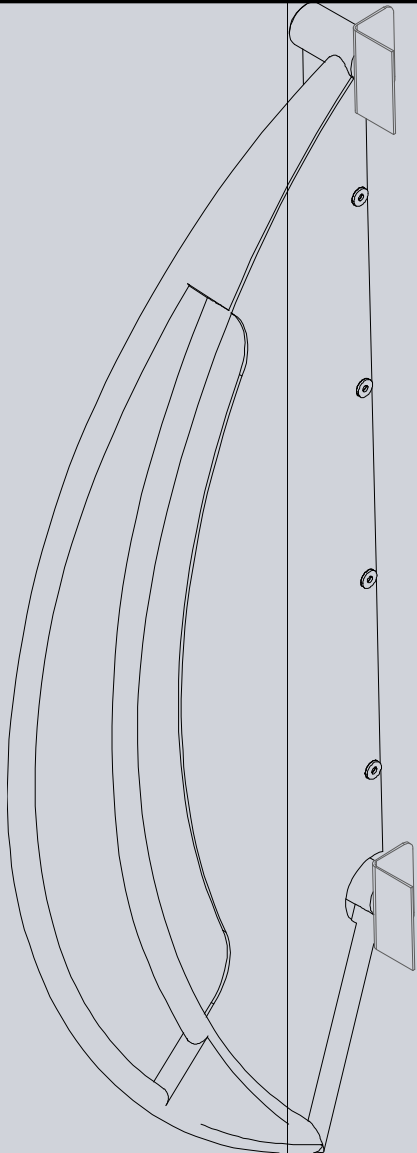


the concept ...

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modular design kit

boarding aids and windscreens



thanks to modular construction, the
variability of boarding aids and
windscreens ist virtually unlimited

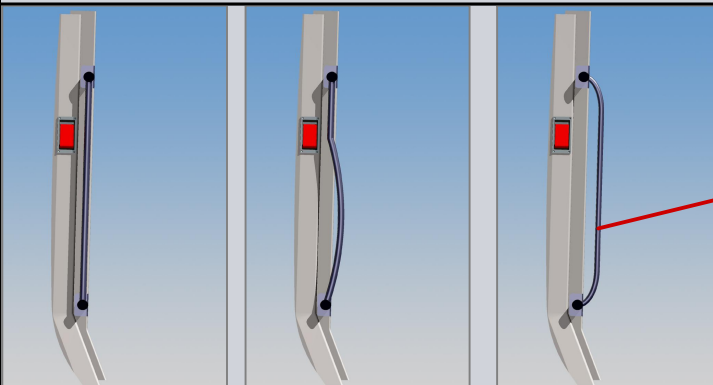


the concept ...

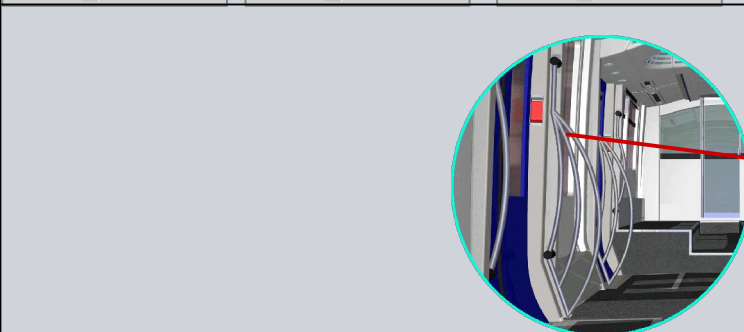
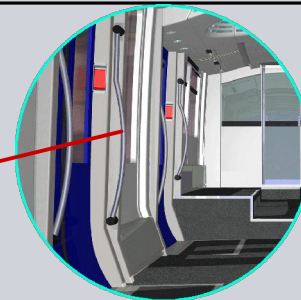
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modular design kit

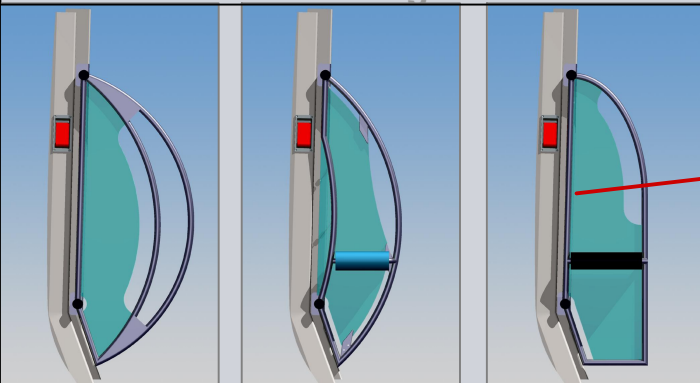
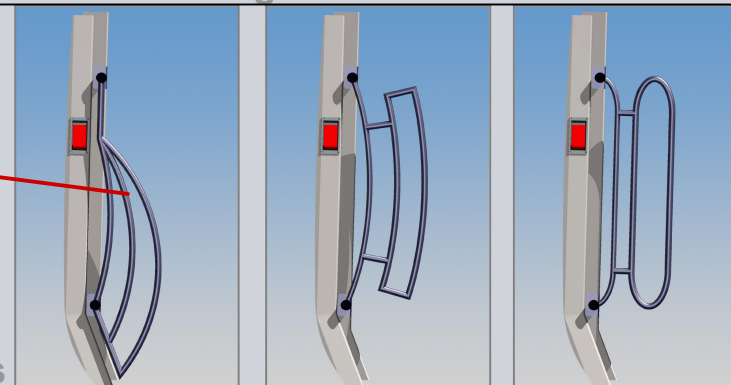
boarding aids and windscreens



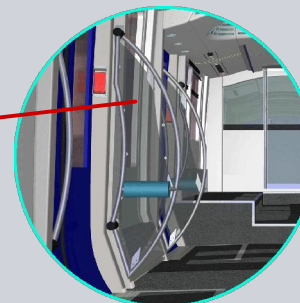
boarding aids with a single handle



boarding aids with multiple handles



windscreens



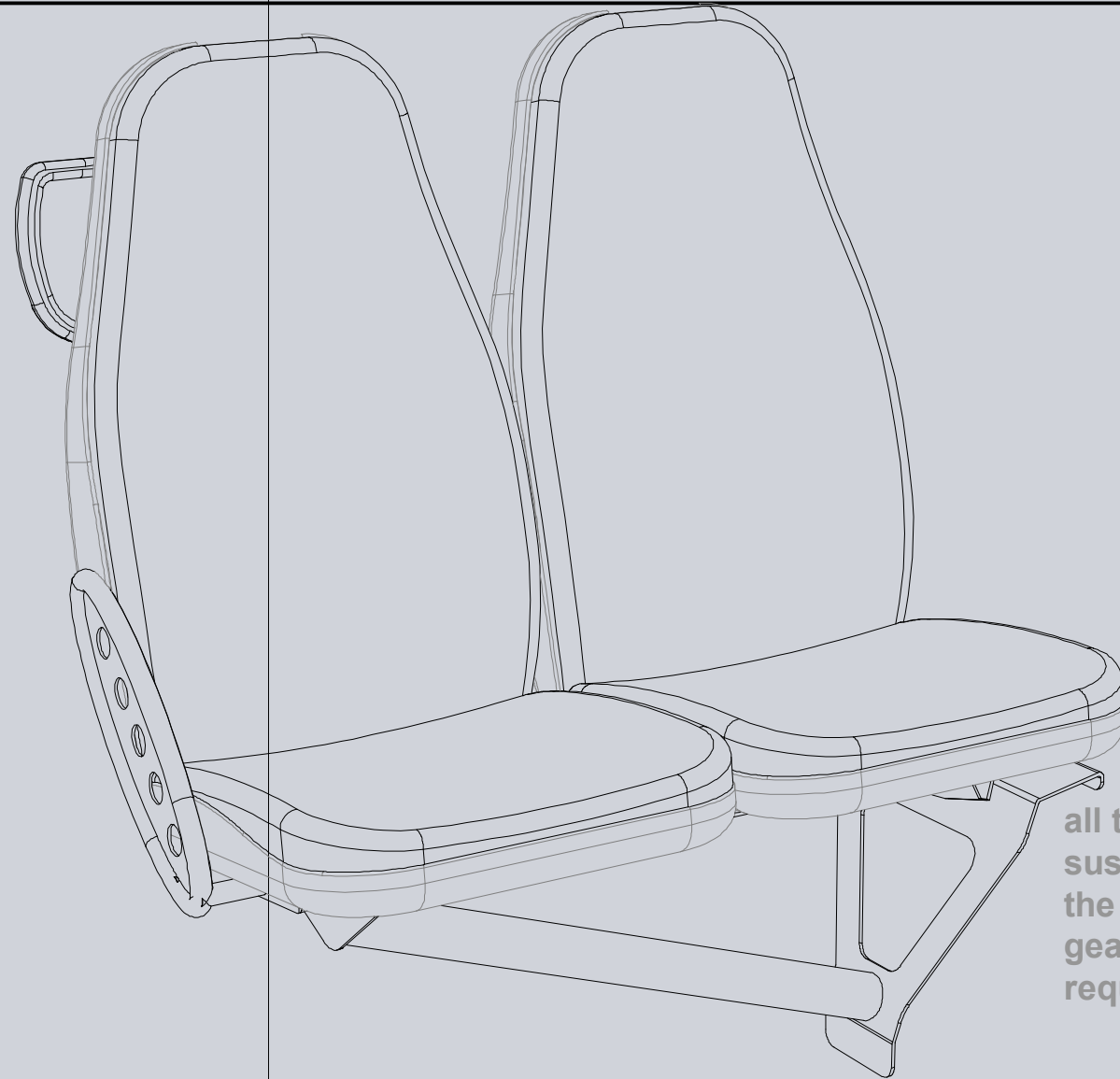


the concept ...

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modular design kit

seats and seat groups



all types of seating with cantilever suspension can be used in the Avanto; the seat groups situated over the running gear can be adapted to any type of seat requested



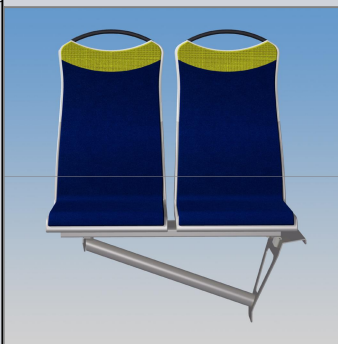
the concept ...

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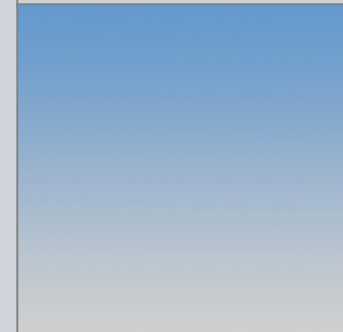
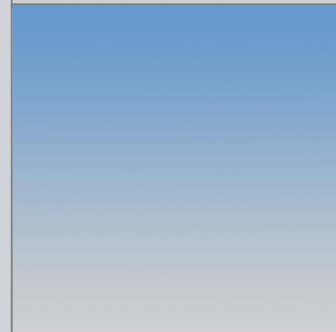
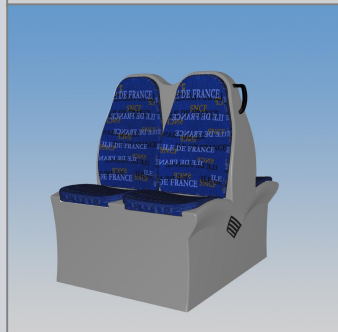
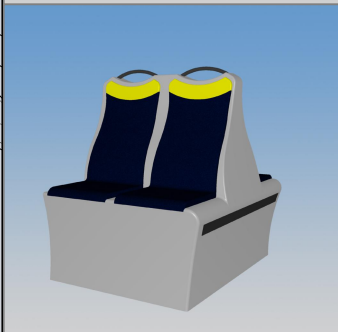
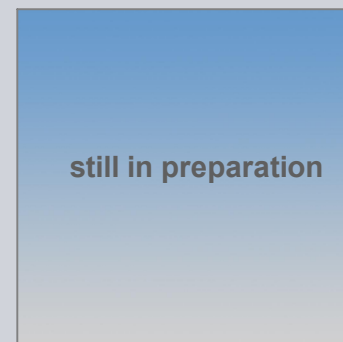
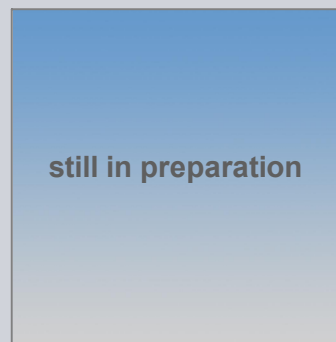
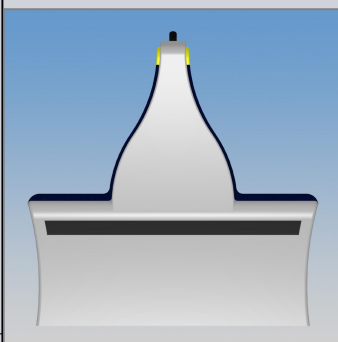
modular design kit

seats and seat groups

seats



seat groups



still in preparation

still in preparation

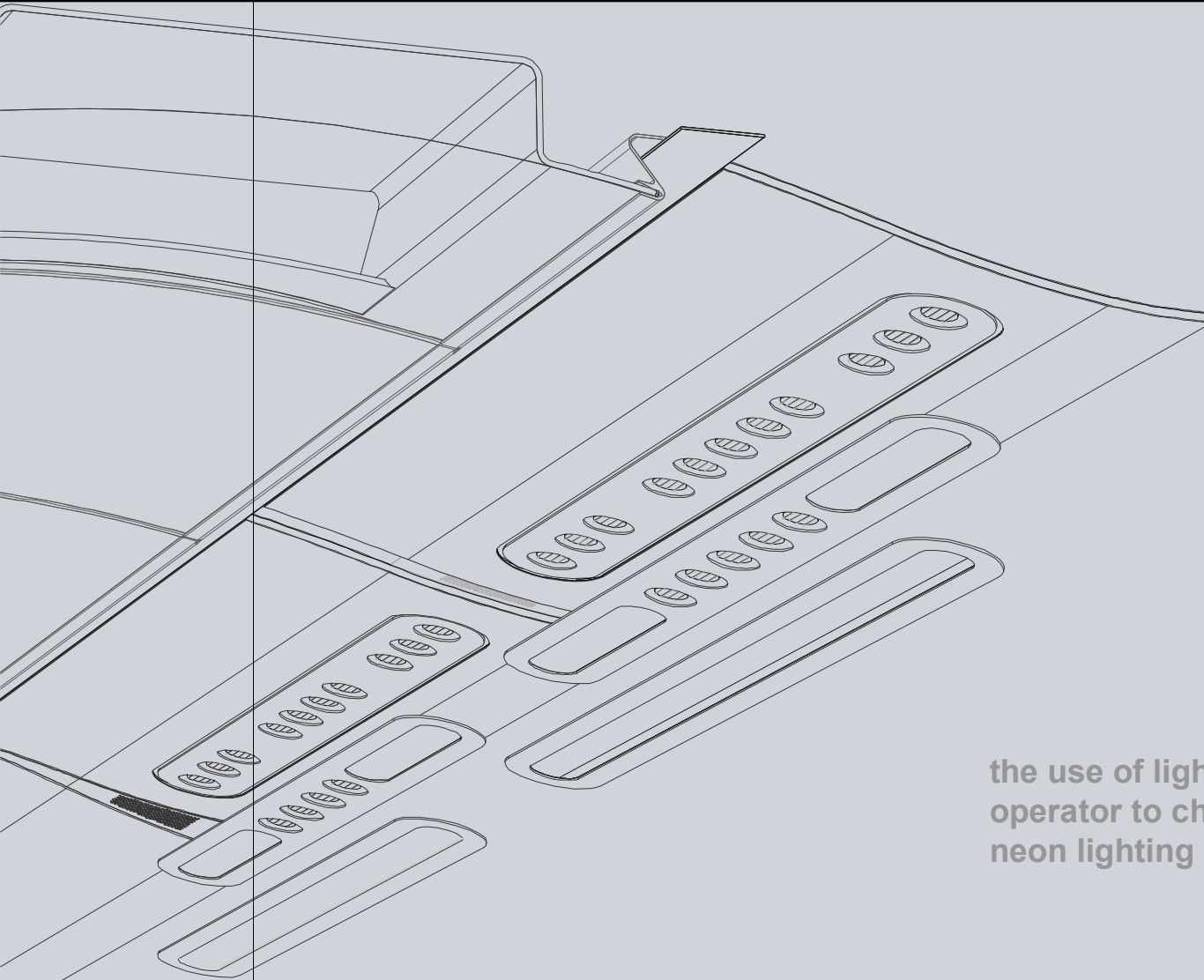


the concept ...

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modular design kit

lighting



the use of lighting modules allows the operator to change from spot lighting to neon lighting in an existing vehicle



the concept ...

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modular design kit

lighting

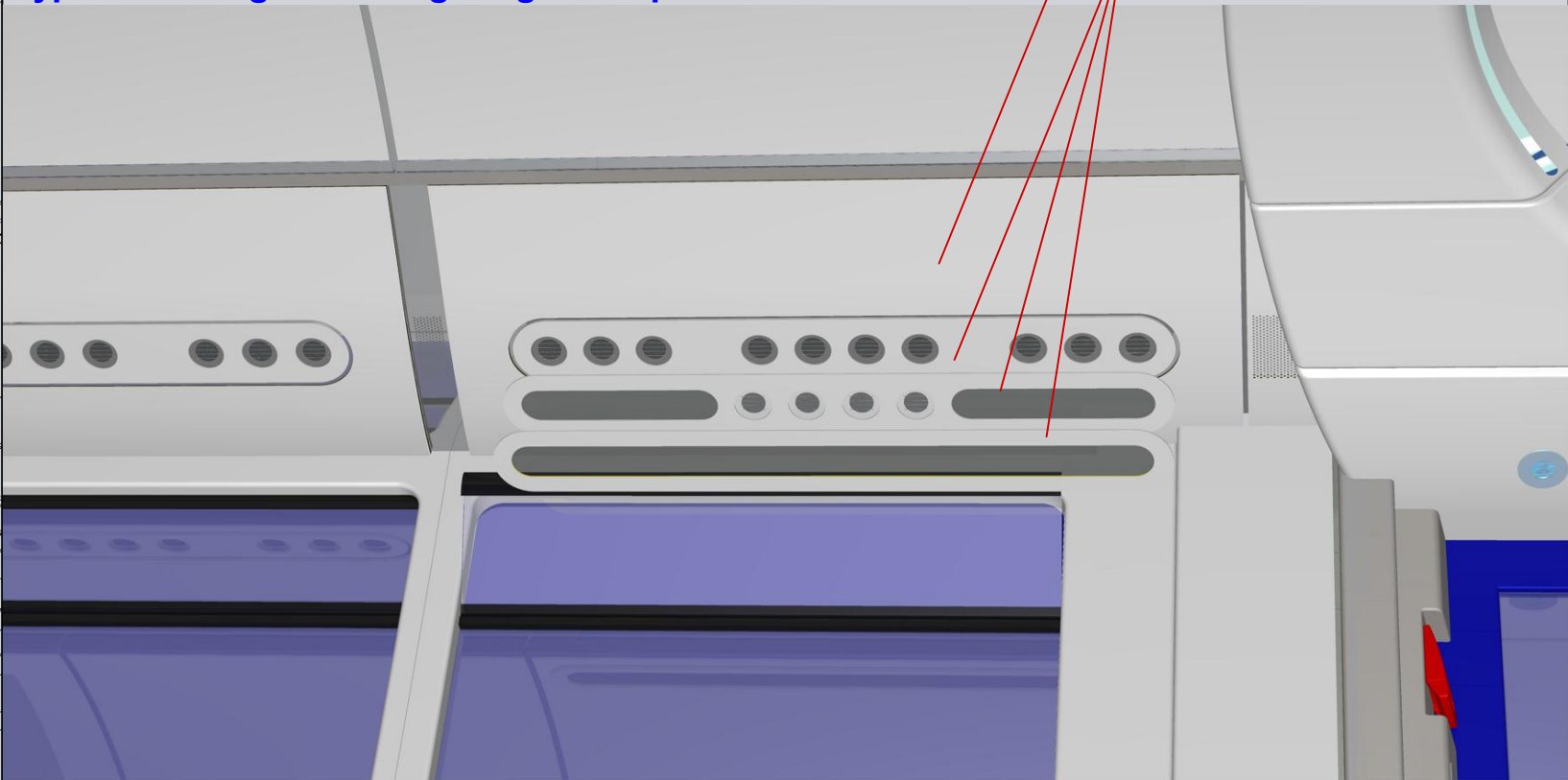
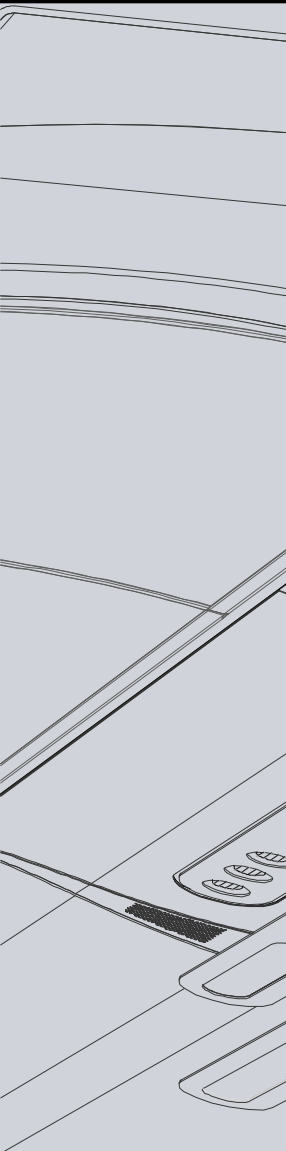
insert modules can be easily integrated in the fixed cutouts provided in the coving:

- with neon lighting (value for money, but creates a cold lighting effect)
- or with spotlights (expansive but creates a soft, warm lighting effect)
- or with mixed lighting (a compromise)

type and design of the lighting concept

coving

lighting modules





the concept ...

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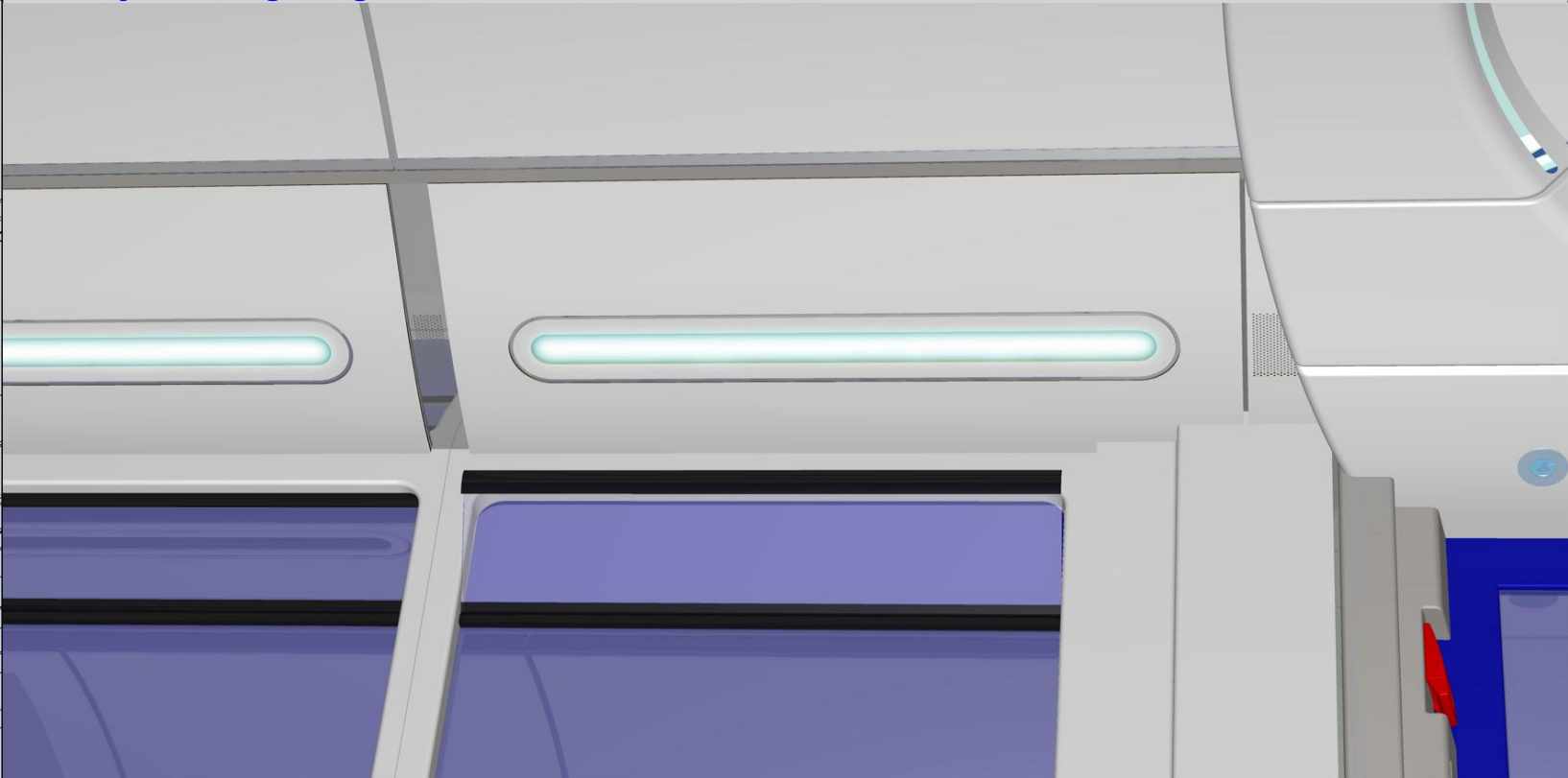
modular design kit

lighting

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- or with mixed lighting (a compromise)

strictly neon lighting





the concept ...

SIEMENS

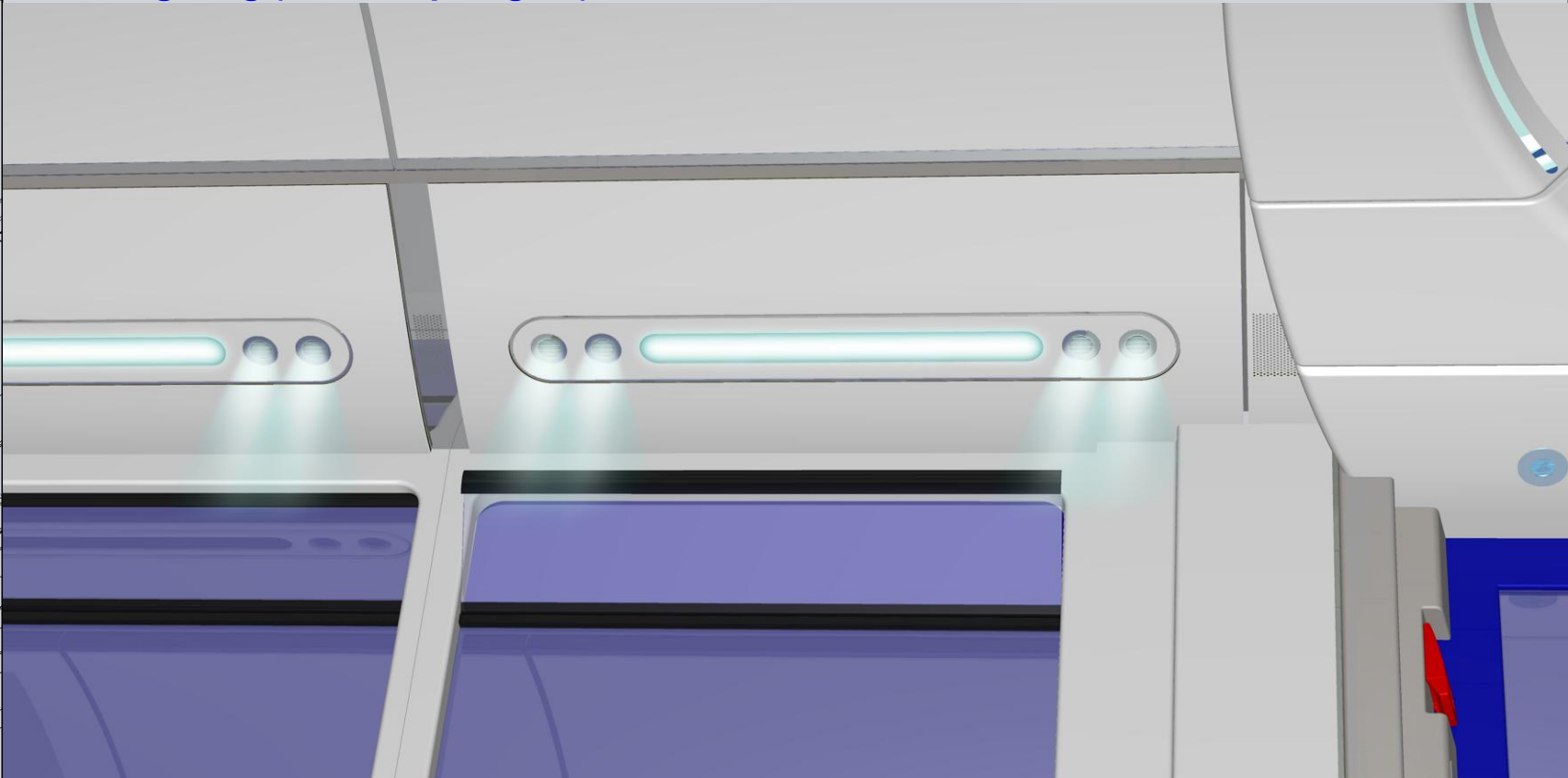
modular design kit

lighting

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mixed lighting (neon + spotlights)





the concept ...

SIEMENS

modular design kit

lighting

insert modules can be easily integrated in the fixed cutouts provided in the coving:

- with neon lighting (value for money, but creates a cold lighting effect)
- or with spotlights (expansive but creates a soft, warm lighting effect))
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mixed lighting (neon + spotlights)





the concept ...

SIEMENS

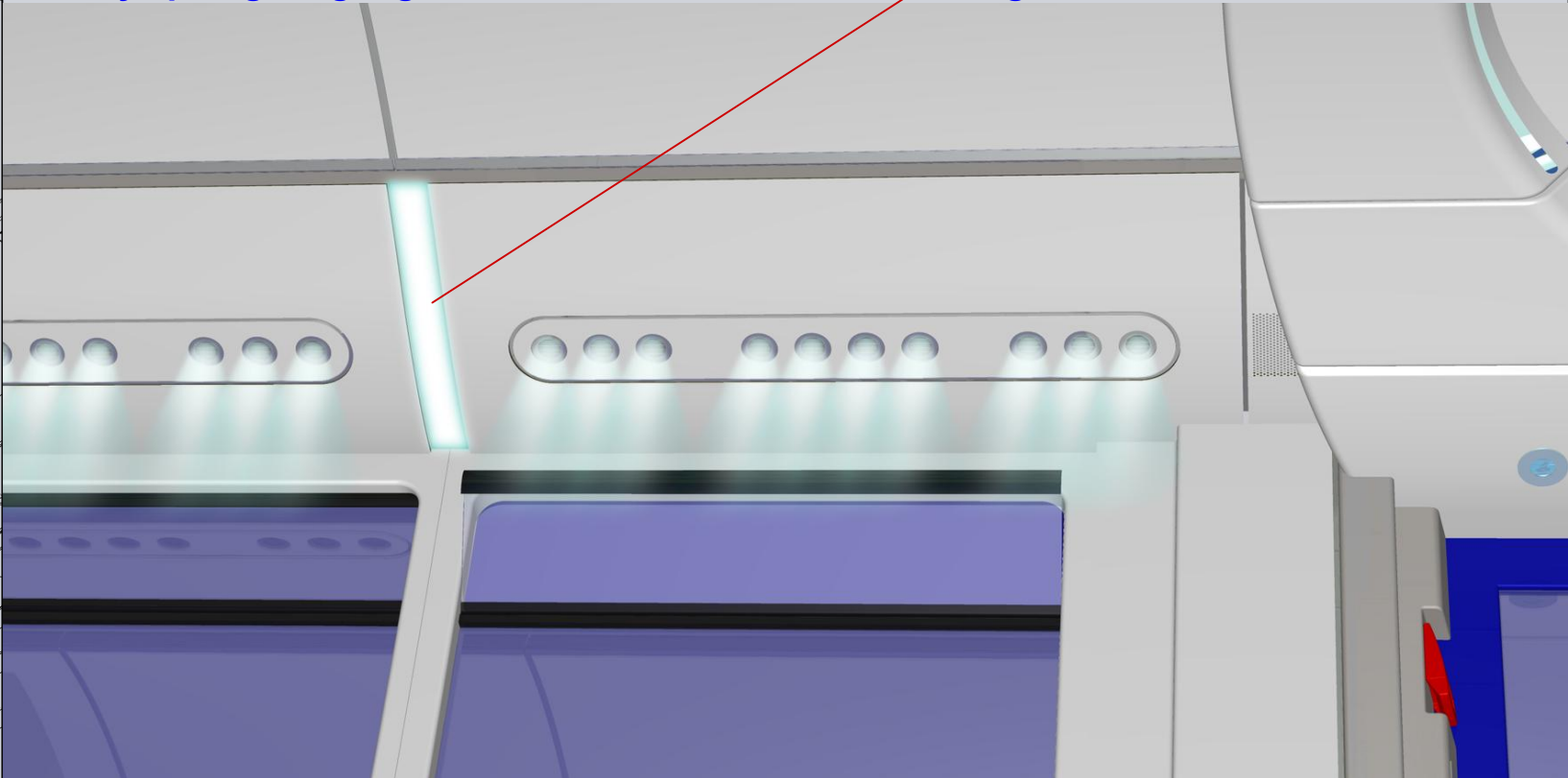
modular design kit

lighting

insert modules can be easily integrated in the fixed cutouts provided in the coving:

- with neon lighting (value for money, but creates a cold lighting effect)
- or with spotlights (expansive but creates a soft, warm lighting effect)
- or with mixed lighting (a compromise)

strictly spotlighting together with illumination of the coving sections



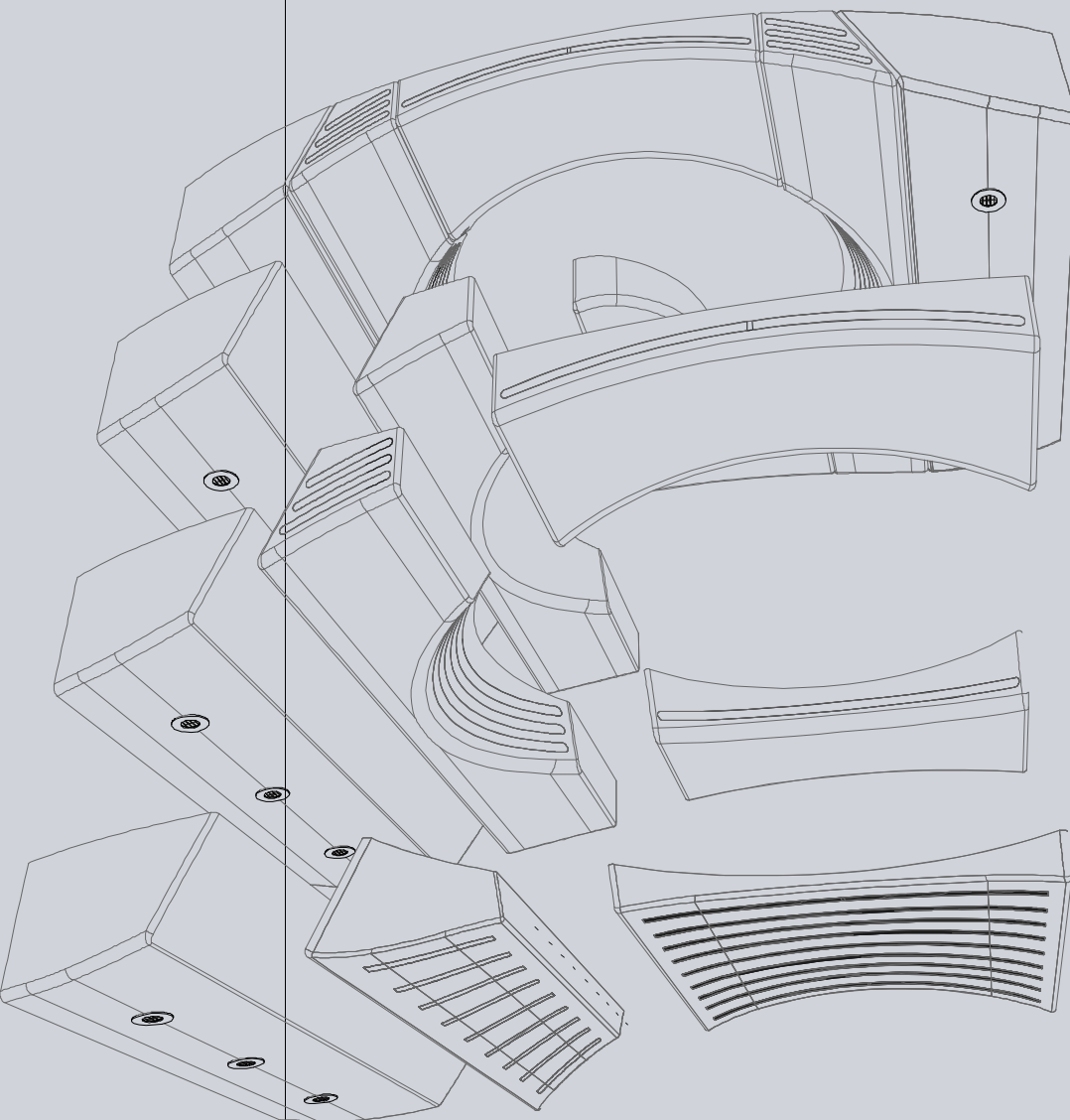


the concept ...

SIEMENS

modular design kit

door drive cladding



the wide variety of paneling modules
enables different combinations to be used
to cover the door drives and to create the
most diverse interior ambiances

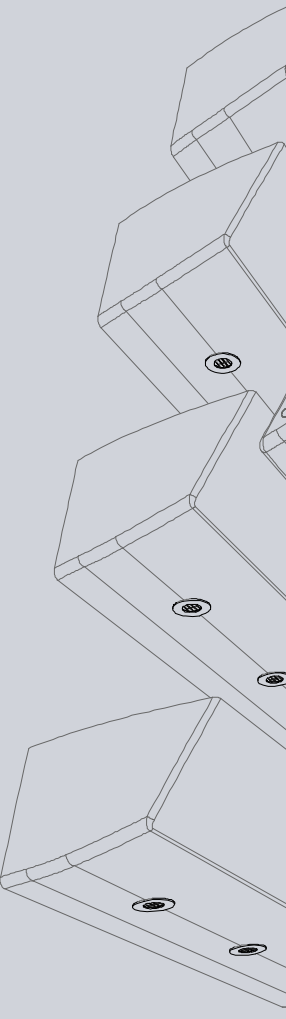


the concept ...

SIEMENS

modular design kit

door drive claddings

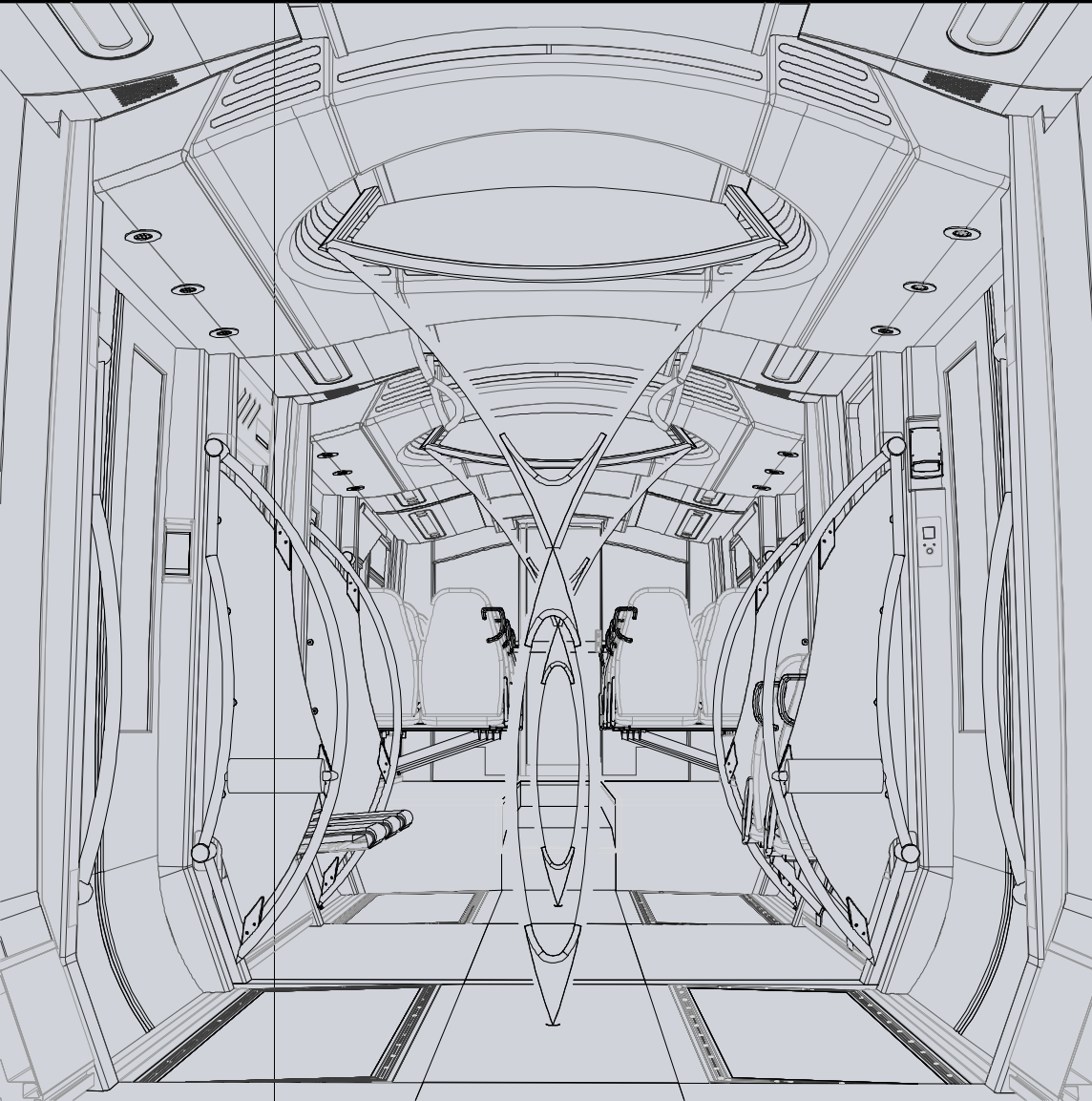




interior design pictures *Avanto Paris*

SIEMENS

interior views of car section A



the following pictures give you an impression of how the modular design allows the interior of the vehicle to be arranged in so many different and attractive ways

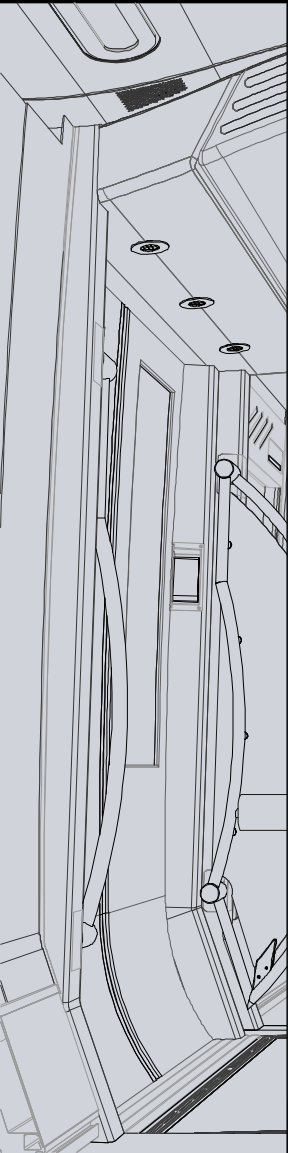


interior design pictures *Avanto Paris*

SIEMENS

interior views of car section A

basic 1



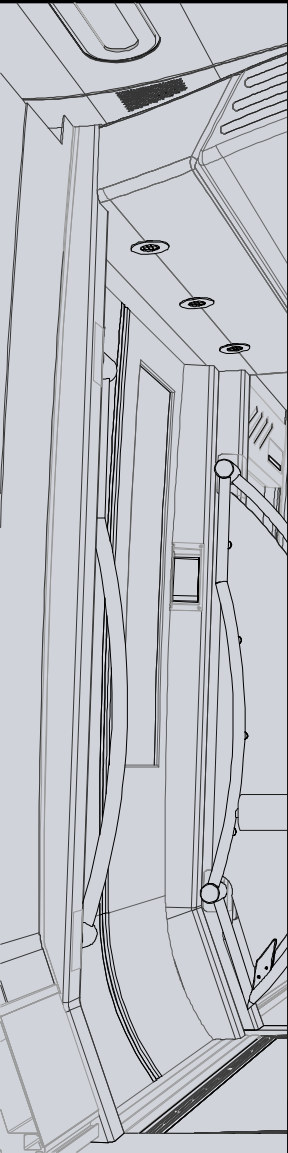


interior design pictures *Avanto Paris*

SIEMENS

interior views of car section A

basic 1



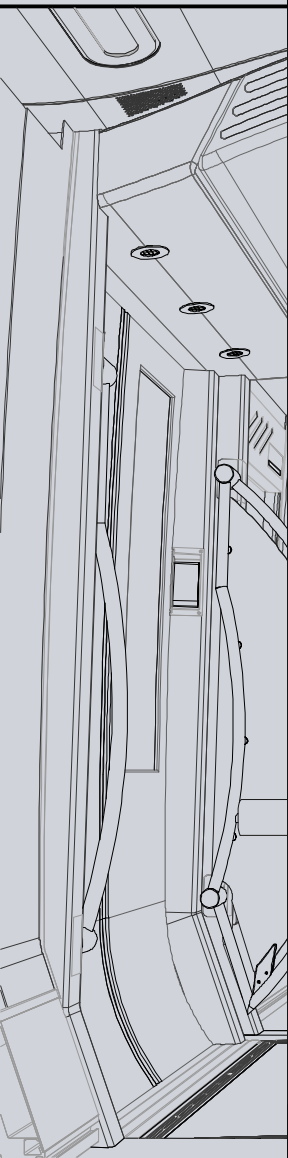


interior design pictures *Avanto Paris*

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interior views of car section A

basic 2





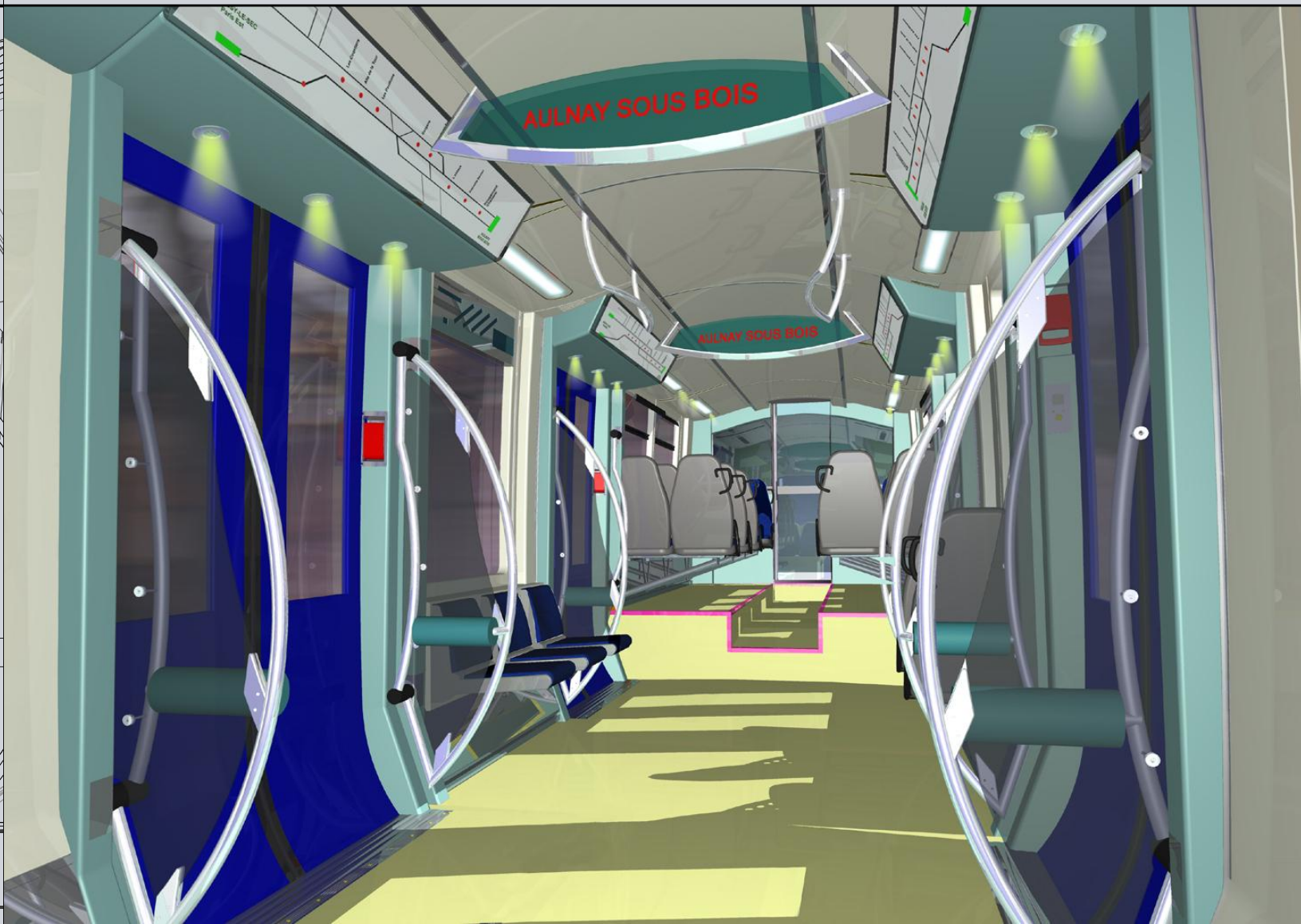
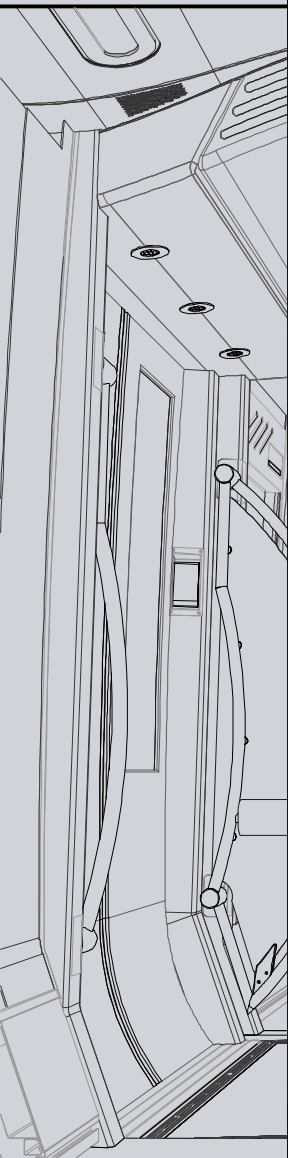
interior design pictures

Avanto Paris

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interior views of car section A

basic 3





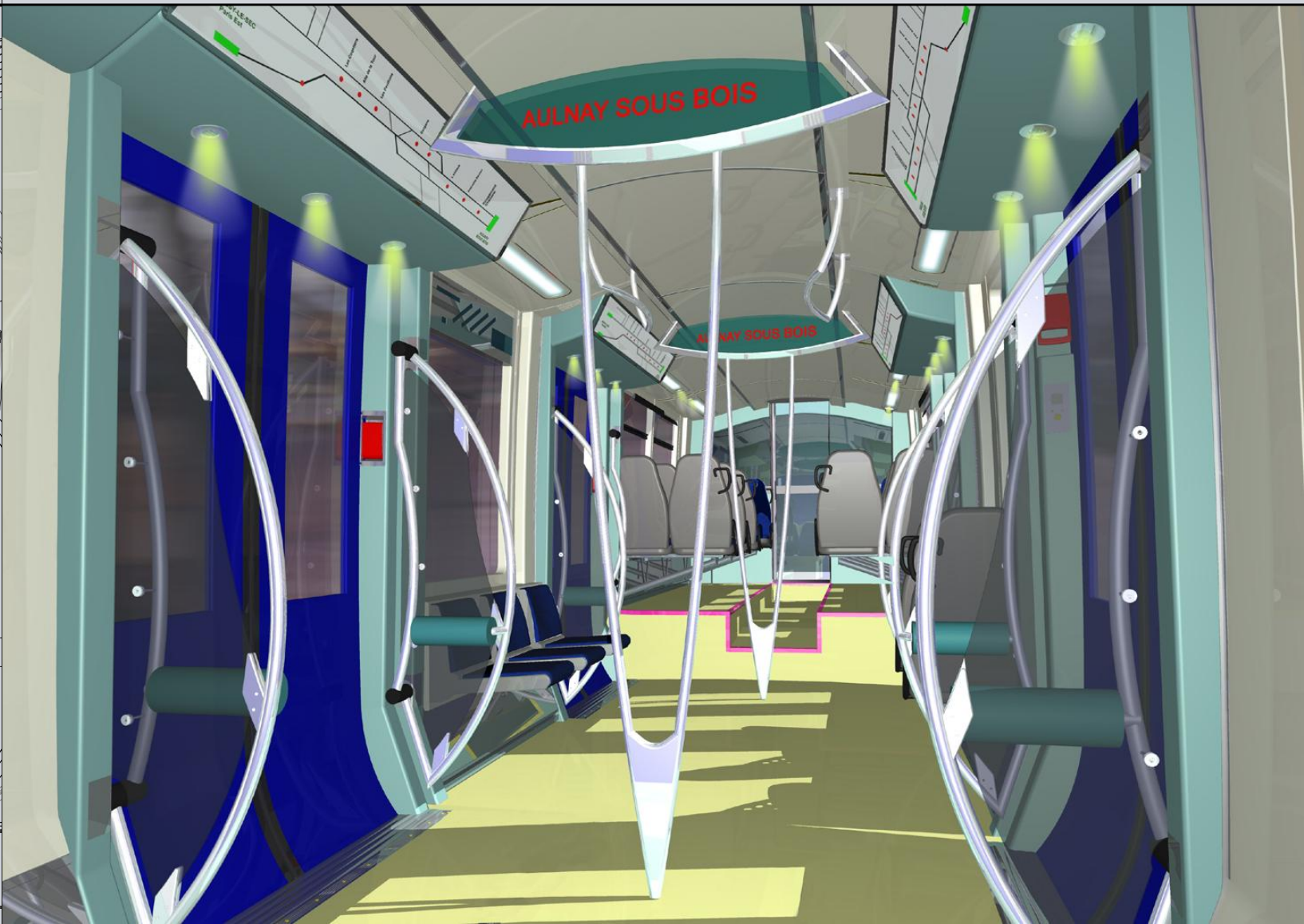
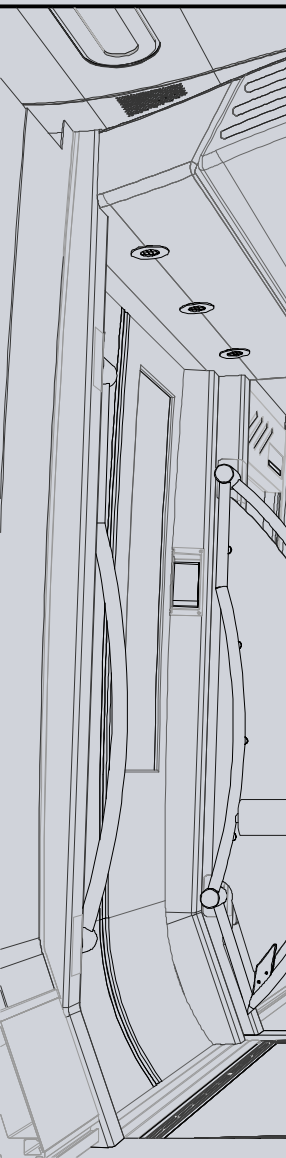
interior design pictures

Avanto Paris

SIEMENS

interior views of car section A

medium





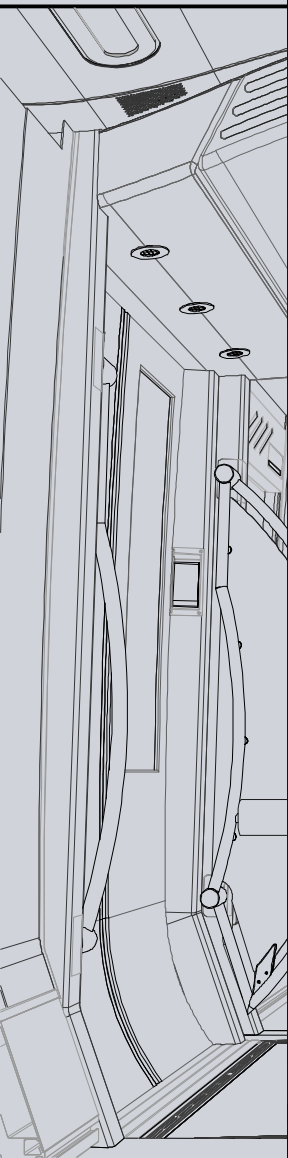
interior design pictures

Avanto Paris

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interior views of car section A

classic 1





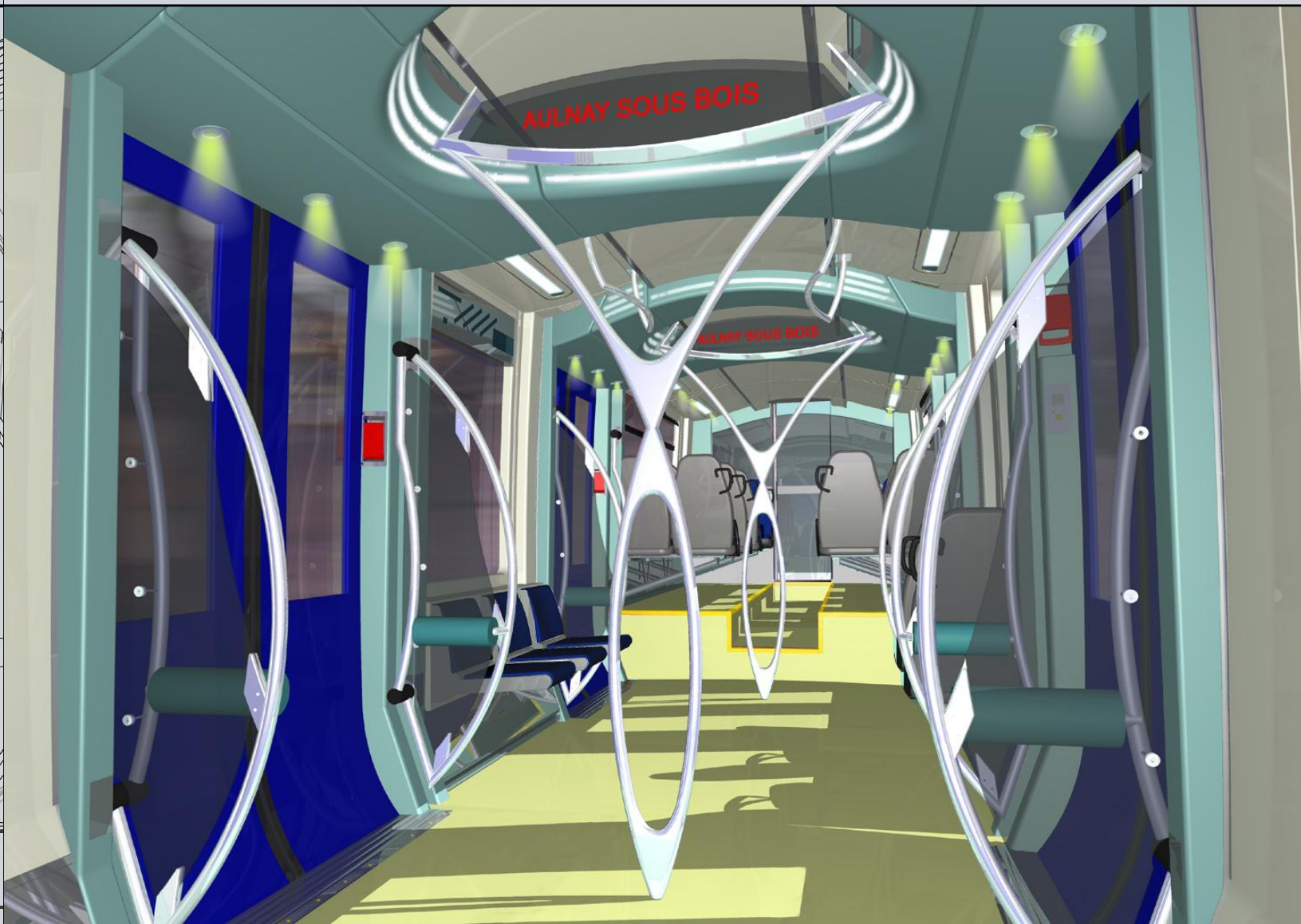
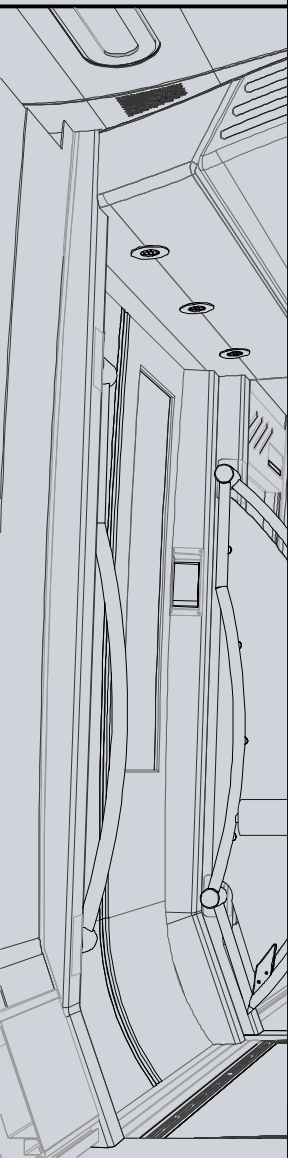
interior design pictures

Avanto Paris

SIEMENS

interior views of car section A

classic 2





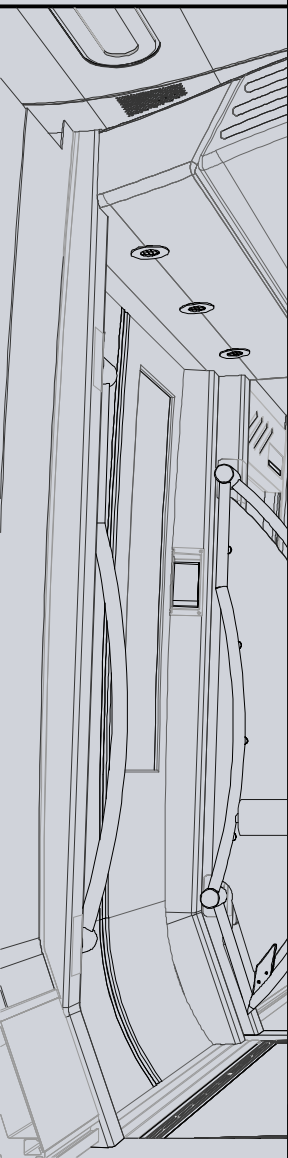
interior design pictures

Avanto Paris

SIEMENS

interior views of car section A

classic 3

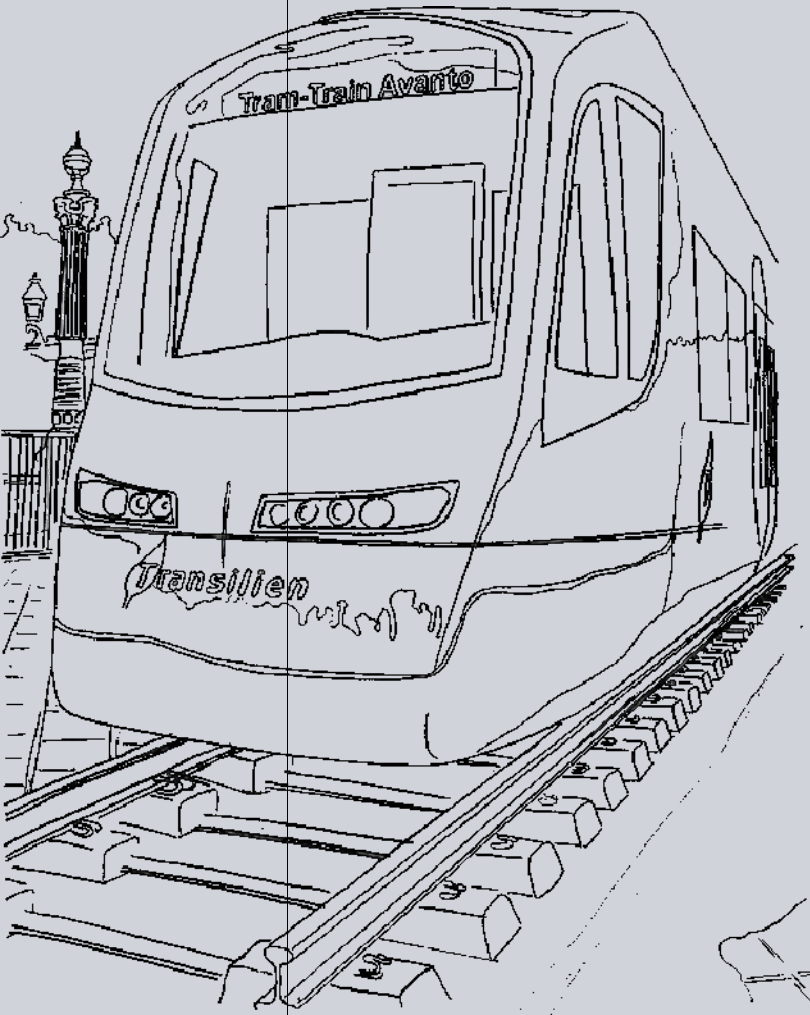




Le Train Capitale, in Paris

SIEMENS

Avanto mockup on show on the Place de la Concorde



specifically for SNCF's rail systems exhibition on the Champs-Élysées, Siemens prepared a fullscale model of the Avanto made of fiberglass-reinforced plastic and wood

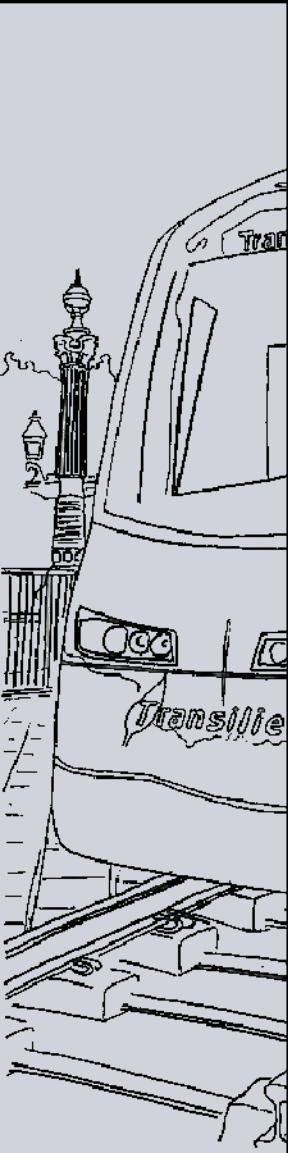


Le Train Capitale, in Paris

SIEMENS

Avanto mockup on show on the *Place de la Concorde*

rough wooden frame



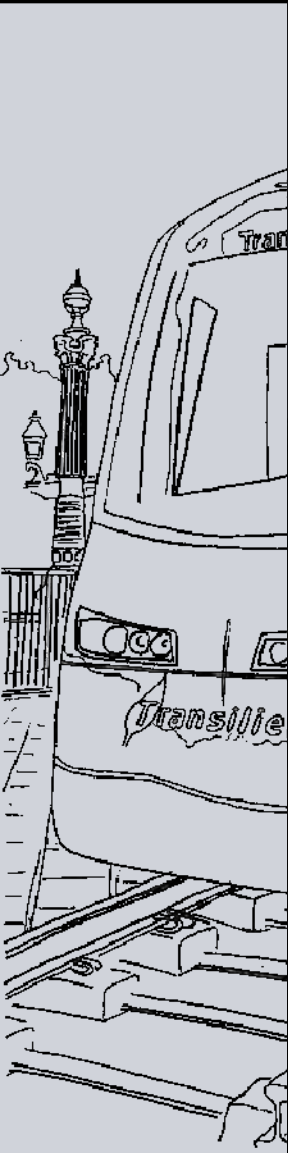


Le Train Capitale, in Paris

SIEMENS

Avanto mockup on show on the *Place de la Concorde*

loading & transport





Le Train Capitale, in Paris

SIEMENS

Avanto mockup on show on the *Place de la Concorde*

presentation



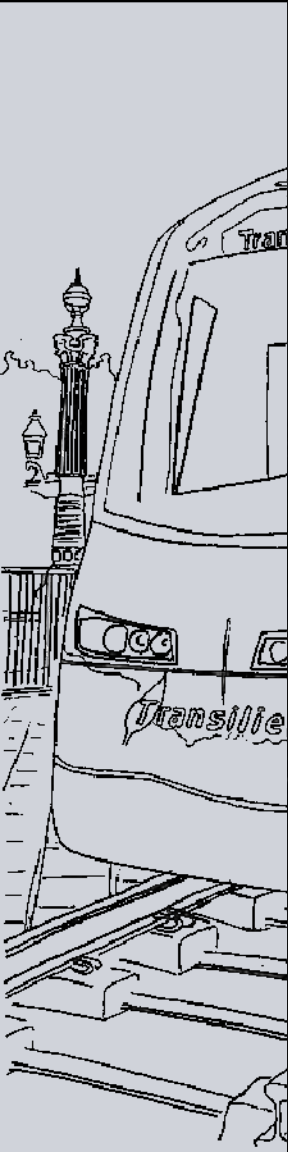


Le Train Capitale, in Paris

SIEMENS

Avanto mockup on show on the *Place de la Concorde*

presentation

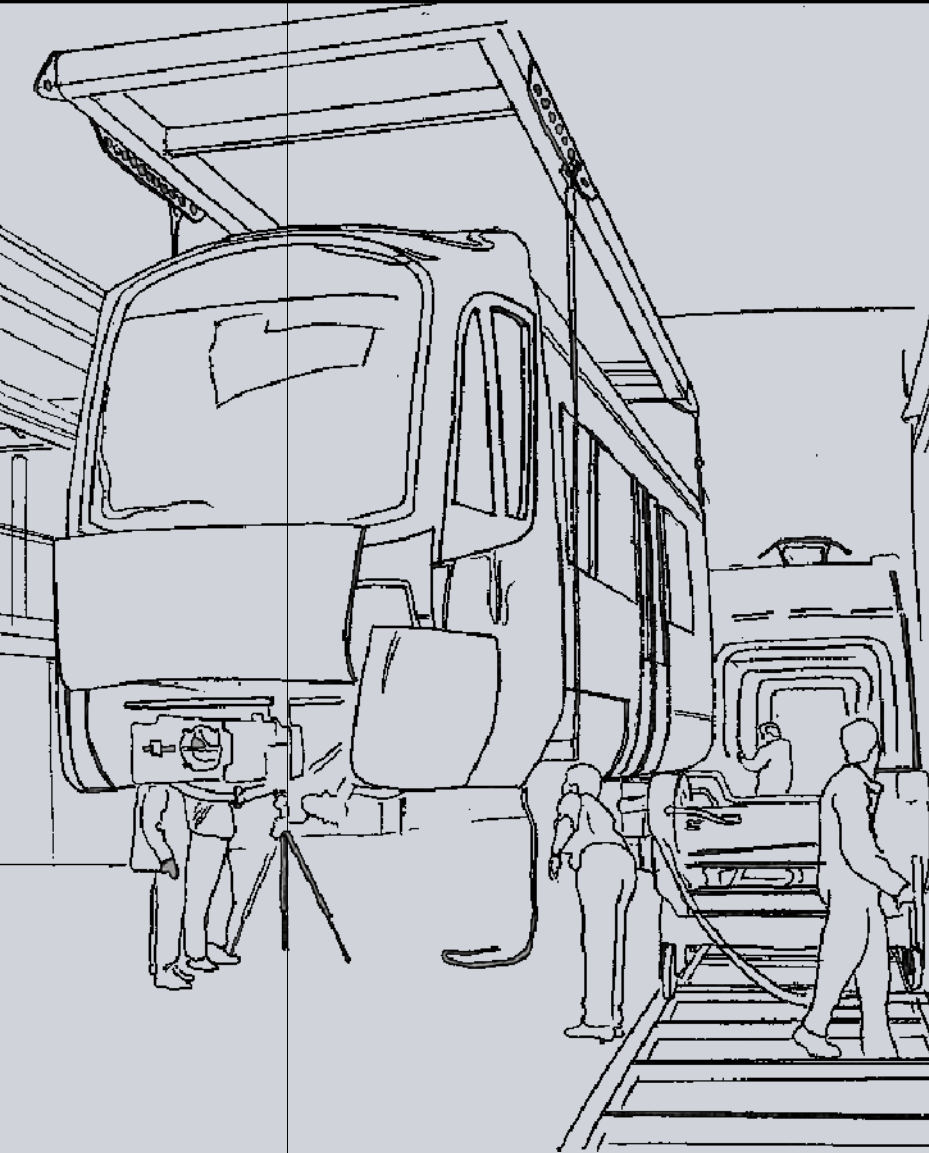




pictures of the production process

SIEMENS

final assembly and commissioning



At this point we would like to give you a few impressions of the final assembly and commissioning of the Avanto

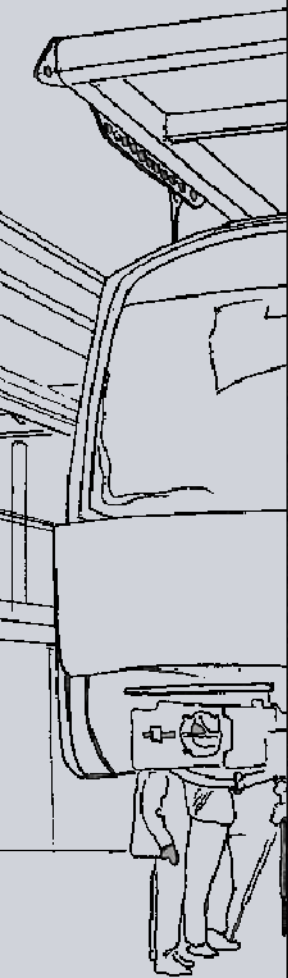


pictures of the production process

SIEMENS

final assembly and commissioning

coupling



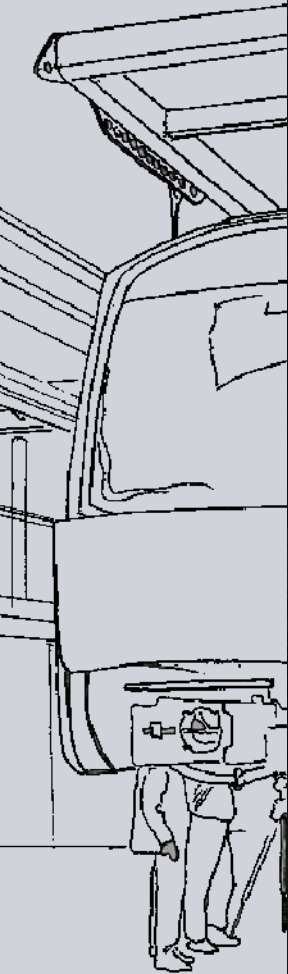


pictures of the production process

SIEMENS

final assembly and commissioning

placing body on running gear



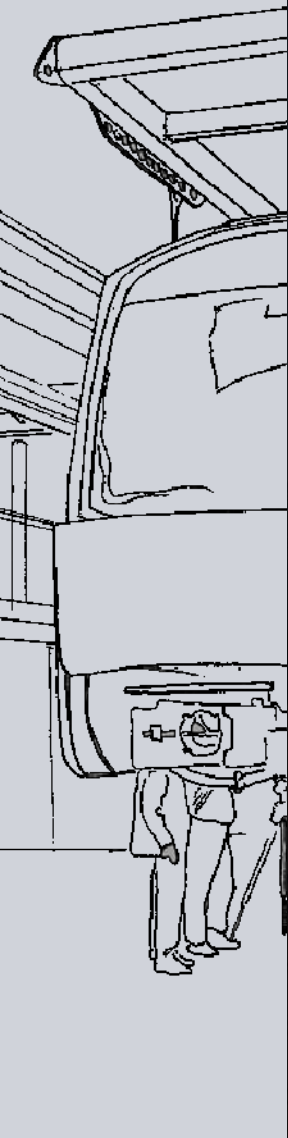


pictures of the production process

SIEMENS

final assembly and commissioning

after placing body on running gear



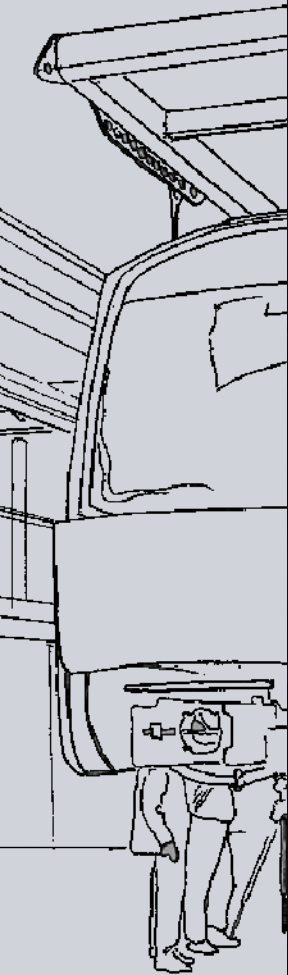


pictures of the production process

SIEMENS

final assembly and commissioning

entrance area



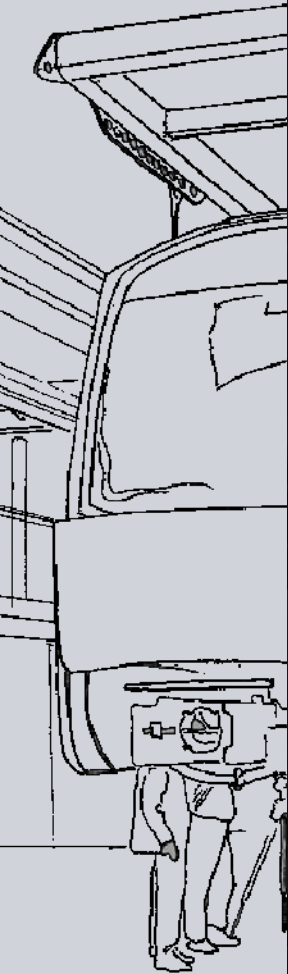


pictures of the production process

SIEMENS

final assembly and commissioning

entrance area





pictures of the production process

SIEMENS

final assembly and commissioning

entrance area





pictures of the production process

SIEMENS

final assembly and commissioning

entrance area and articulation portal



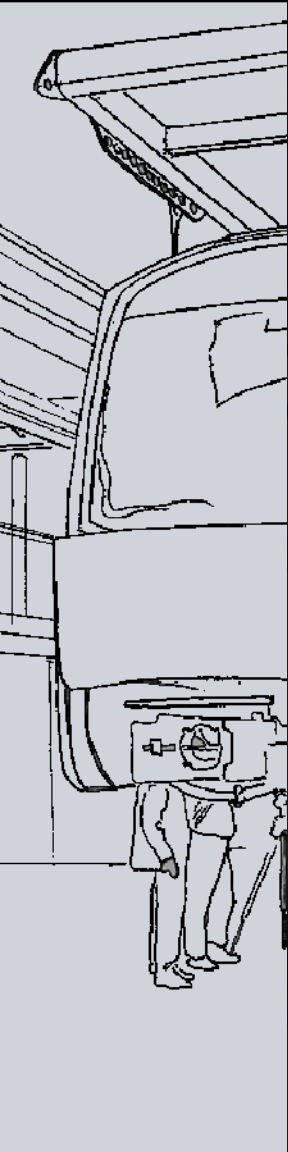


pictures of the production process

SIEMENS

final assembly and commissioning

ceiling with lighting modules





pictures of the production process

SIEMENS

final assembly and commissioning

ceiling with lighting modules



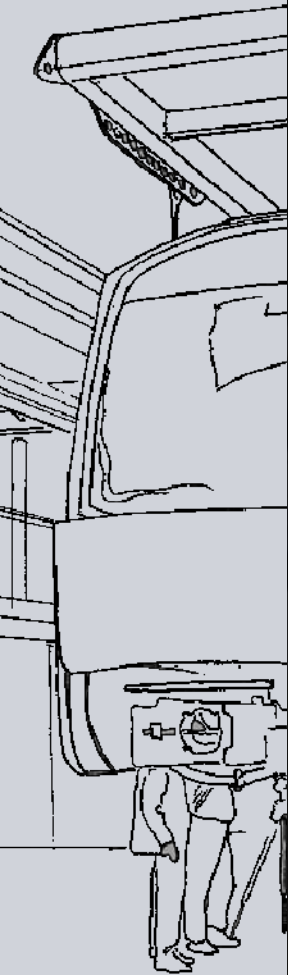


pictures of the production process

SIEMENS

final assembly and commissioning

ceiling with lighting modules



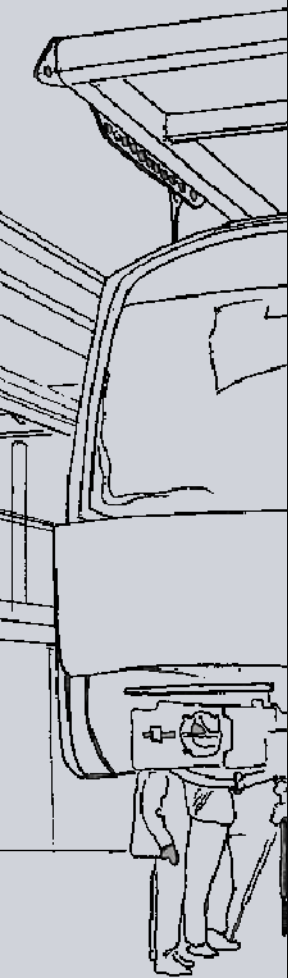


pictures of the production process

SIEMENS

final assembly and commissioning

integrated loudspeakers



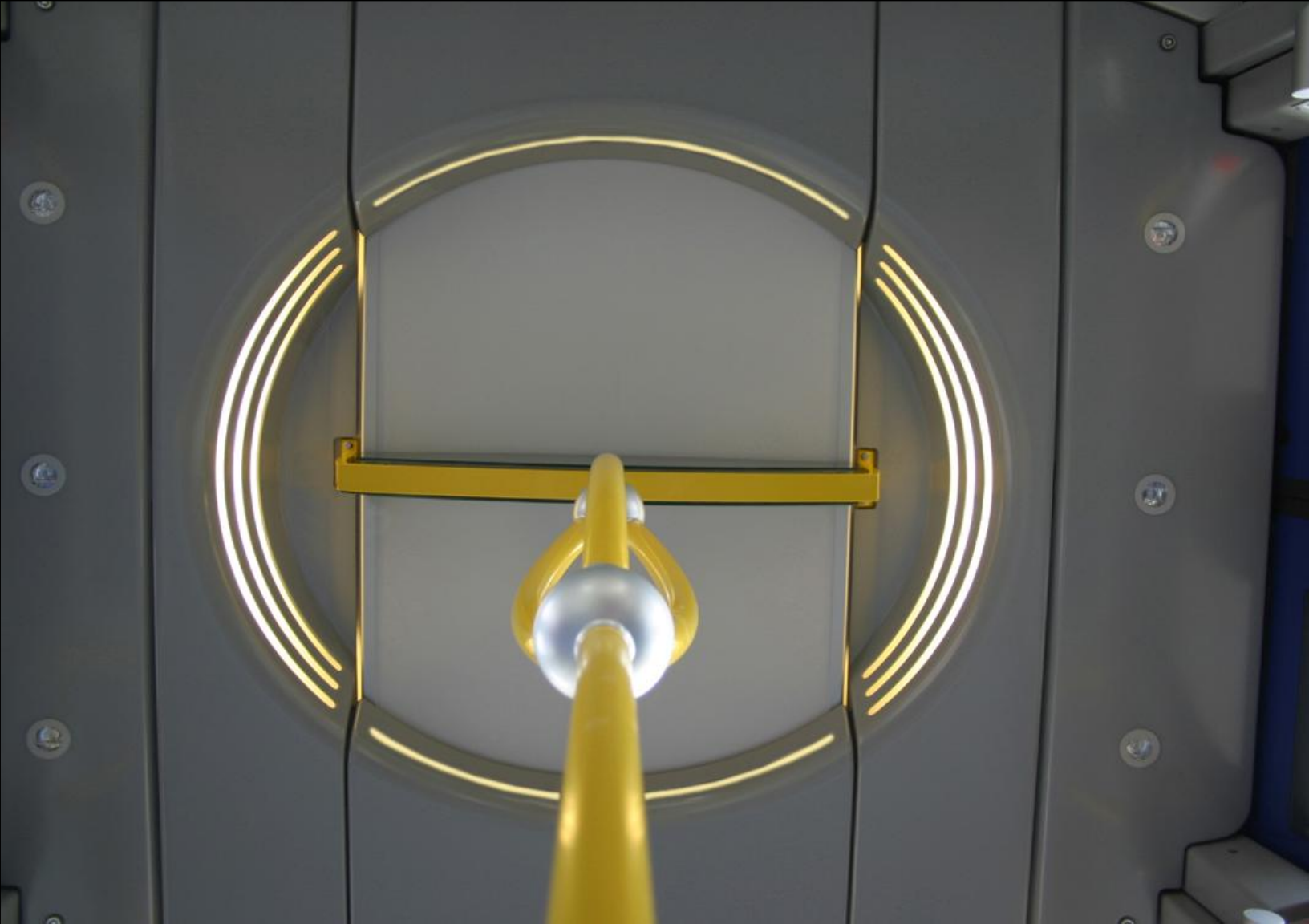


pictures of the production process

SIEMENS

final assembly and commissioning

bottom view of ring module



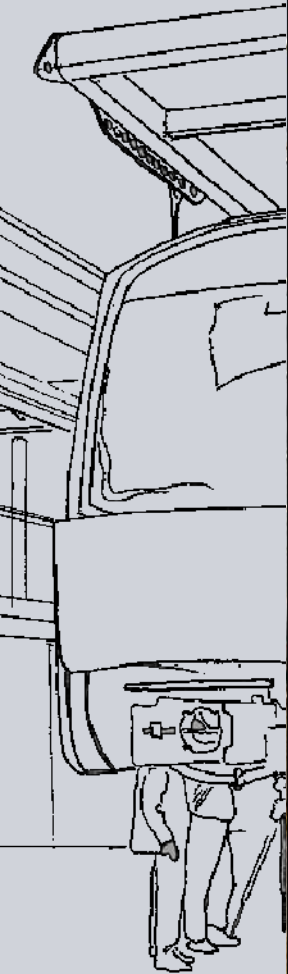


pictures of the production process

SIEMENS

vehicle at the test center

first test run



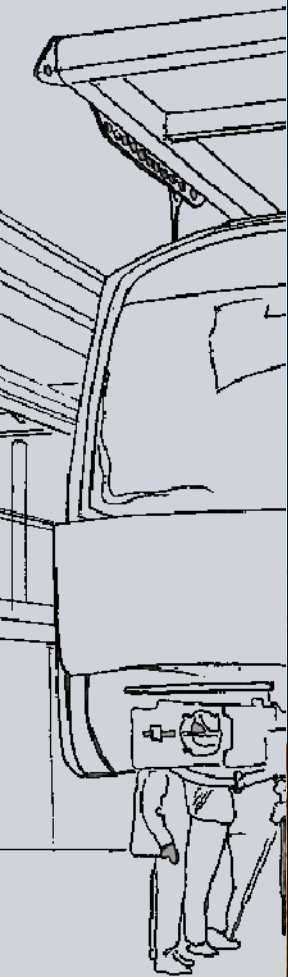


pictures of the production process

SIEMENS

vehicle at the test center

first test run



win-win situation for customer and manufacturer:

Customer benefits:

- Vehicle adaptation to financial possibilities of the customer (later upgrade if required)
- Vehicle equipment *by catalogue* is possible
- A design refresh of the interior is possible at any time with low overhead

Manufacturer benefits:

- Competitive advantage due to the large number of individual customer solutions
- Possibility for future extensions
- Reduction in the engineering overhead and tool costs through modularity and high proportion of identical parts

**Thank you for paying
attention**

Annex



Annex

SIEMENS

The Avanto Mulhouse

exterior paint



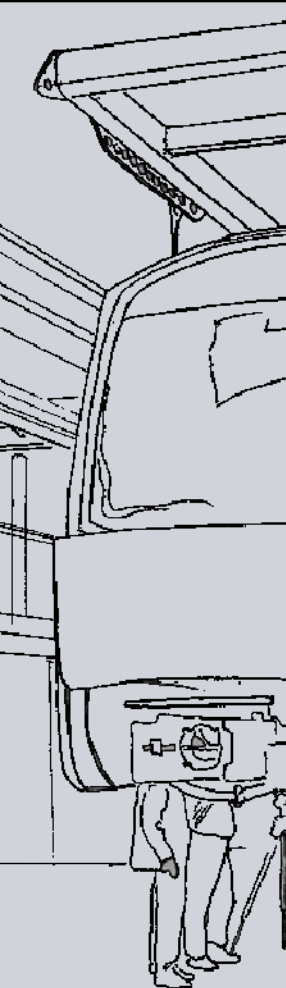


Annex

SIEMENS

The Avanto Mulhouse

exterior paint



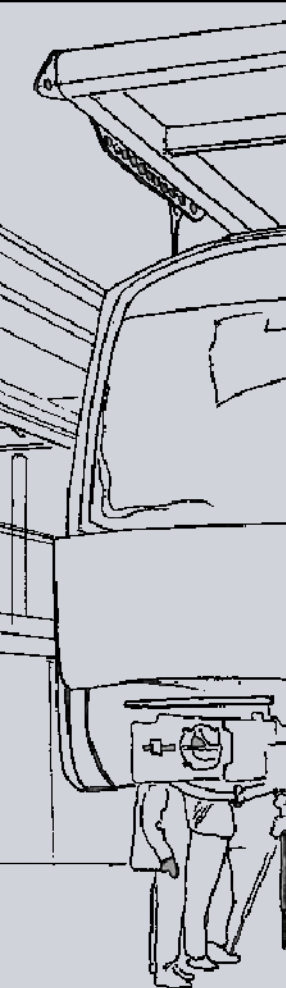


Annex

SIEMENS

The Avanto Mulhouse

ceiling with lighting modules





Annex

SIEMENS

The Avanto Mulhouse

Stuffed seat

