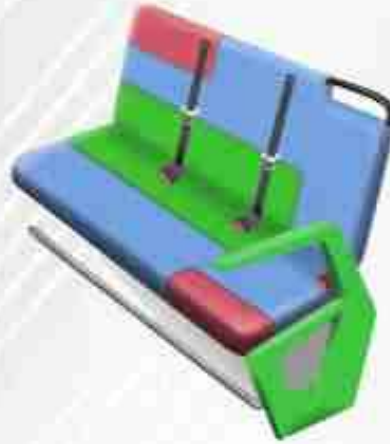


PASSENGER BUS SEATING SYSTEM



Concept Design

- Ergonomic study
- Foam design
- Customer comfort feature study
- Seat trim and stitching design

Engineering design

- Frame design
- Injection molded seat design
- Blow molded seat design.
- Foam design
- Commonization in seat frame

Engineering analysis

- Sled test
- H1-H2 test
- Modal analysis
- Vibration analysis
- Seat anchorage test

Other services

- Optimisation projects
- Prototype building
- Physical testing co-ordination for AIS, ECE & FMVSS regulation

COMPUTER AIDED DESIGN (CAD)



Ctrine
Engineering



Exterior System Design

- Master Section Creation
- Vehicle Integration
- Structure modelling
- Surface Modelling
- PLM management
- E-BOM creation
- Joinery scheme design
- ITES component integration

Structure Modelling

- Monocoque design
- Semi-monocoque design
- Super structure on ladder chassis
- MS, SS, AL material
- BOP integration
- Rigid axle integration
- Independent axle integration

Manufacturing and Installation drawings

- Partwise drawings
- Sub-assembly drawings
- Assembly level drawings
- Homologation drawings
- Installation drawings
- Service drawings

Interior System Design

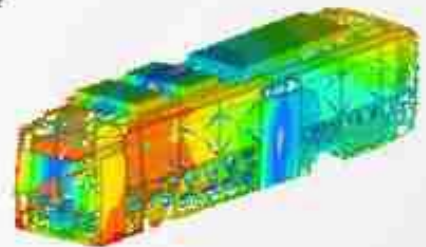
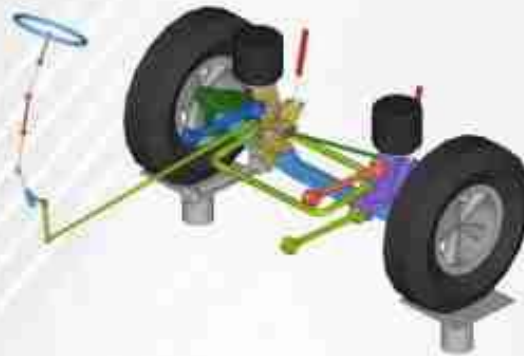
- Vision Study
- Reach analysis
- ABC location design
- Seating system layout design
- Hatrack integration
- Pillar trim designs
- Dashboard designs
- Partition design
- ITES component integration

Electrical, Braking, and Cooling System

- LV Wiring harness routing
- HV wiring harness routing
- Electrical system panel design
- Pneumatic piping
- Hydraulic piping
- Cooling system routing

Other Services

- DFMEA, DFA, DFM creation
- Legacy data conversion
- Onshore and offshore model
- Turn-key projects
- Prototype projects



Passenger Bus Regulatory Analysis

- Rollover as per ECE, FMVSS, AIS & GB
- Roof crush analysis
- Front impact analysis
- Vehicle under run protection
- Durability analysis
- Fatigue cycle analysis

Chassis

- Modal analysis
- Frequency response
- Tow-bar stress and durability
- Strength of chassis mounted bracket (Axle, Motor, Suspension, Battery)
- Braking, buckling, cornering, pothole, speed breaker simulation

Passenger Bus DVP

- Component level simulation
- Full vehicle MBD (Multi body dynamics)
- Half car MBD simulation
- CFD simulation

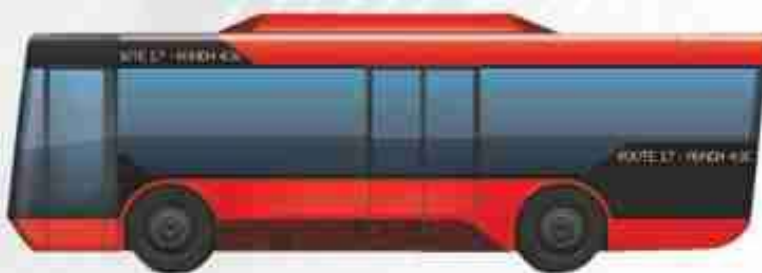
Other Services

- Optimisation projects
- Meshing and model building
- Test co-relation with FEA
- Training and consult

CONCEPT DESIGN



Ctrine
Engineering



Passenger Bus Design

- Benchmarking
- User Persona study
- 2D sketching
- 2D rendering.
- Class A surface creation
- Master section definition
- 3D printing
- VR enabled modelling

Class A Surface Creation

- Point cloud data generation.
- Surface creation
- Joinery study
- Layout
- Vehicle architecture

Exterior System Design

- Decal design
- Logo positioning
- Lights design
- Color pallet
- Glass curves
- Door handle designs

Interior System Design

- Dashboard design
- Dome design
- Lights design
- Seating system design
- Partition design
- Floor matt design
- Driver cabin design

ECO RAPID BUS DESIGN



Ctrine
Engineering



**VOTE IN
OUR BOOTH!**
INNOVATION: ✓ OR X?



With in just 3 simple steps



Choose

Your Bus, Your Way



Customise

Customise Your Bus Experience



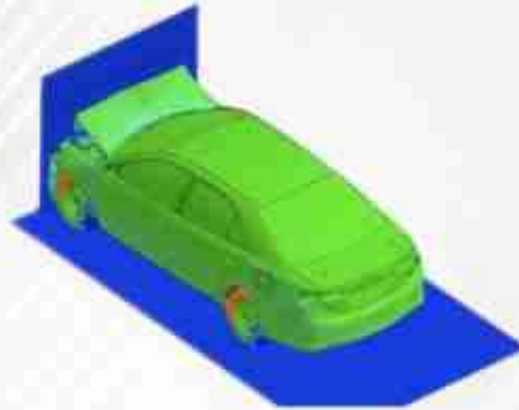
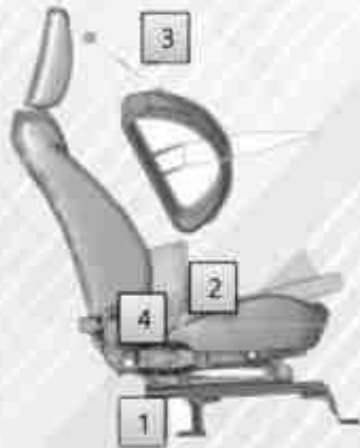
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Tailor-Made Buses



Advantages of Eco Rapid Bus Design

- Unique web based bus design platform
- Country specific design
- Design with simply 3 steps
- AR/VR integration is possible
- Faster time to market
- Integration of *Digital twin* in design & development
- Easy for decision process for management, CXO's, & Investors
- Experience the 360-degree view
- Human centric approach leading to customization
- List of component manufacturers and suppliers
- Hierarchy based login is available
- Estimated BOM along with percentage variation in costing
- Reduce engineering timeline by 50% and above
- Exclusivity agreement is possible
- Subscription base offering



Automotive Engineering Design

- BIW design
- Interior system design
- Seating system design
- Time, Man and Machine base
- Software conversion
- 3D to 2D conversion
- 2D to 3D conversion
- Outsource Design Center (ODC)
- Manufacturing drawing
- Installation drawings
- Mechanism Design
(Recliner, Height adjustors)

Non-automotive Engineering Design

- Conveyor fixture design
- Welding fixture design
- Assembly line component trolley design
- Pick and place robot arm design

Automotive Engineering Analysis

- Full vehicle crash analysis
 - Full frontal impact
 - Offset frontal impact
 - Side impact
 - Rear Impact
- Automotive Seating system
 - Luggage retention
 - HRP
 - Seat belt anchorage
- Automotive interior system
 - Complete IP analysis
 - Door panel analysis
 - Head impact
 - Knee impact
- Automotive exterior system
 - Energy absorption testing

Non-Automotive Engineering Analysis

- Stress-strain simulations on robot arms
- Stress-strain simulation on fixtures
- Static simulations
- Quasistatic simulations