



LIGHTWEIGHT
SOLUTIONS

TGM Weight Data Tool

Introduction Weight Data Tool

1. Introduction of the WDT Software
2. Reasons for WDT
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4. Use Cases / Live Demo
5. Contacts



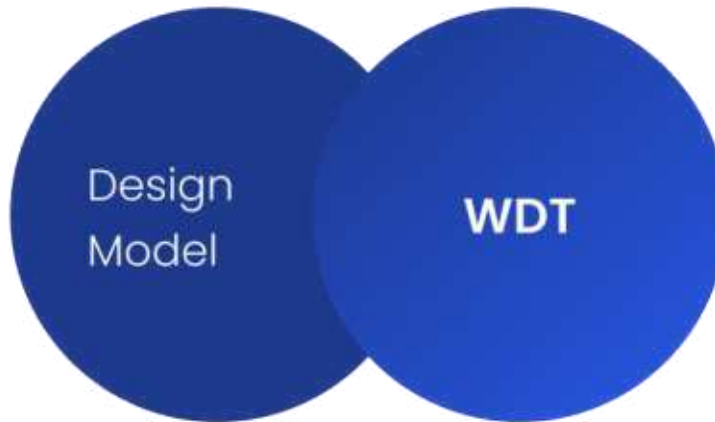
Introduction WDT Software



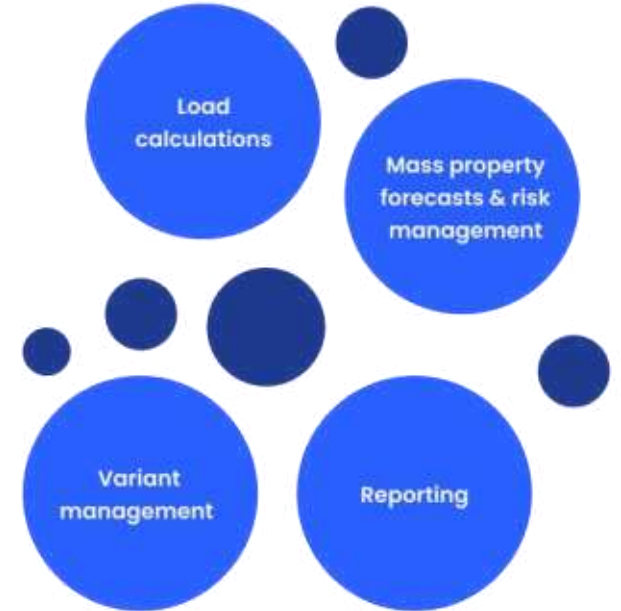
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Rough project or bidding requirements



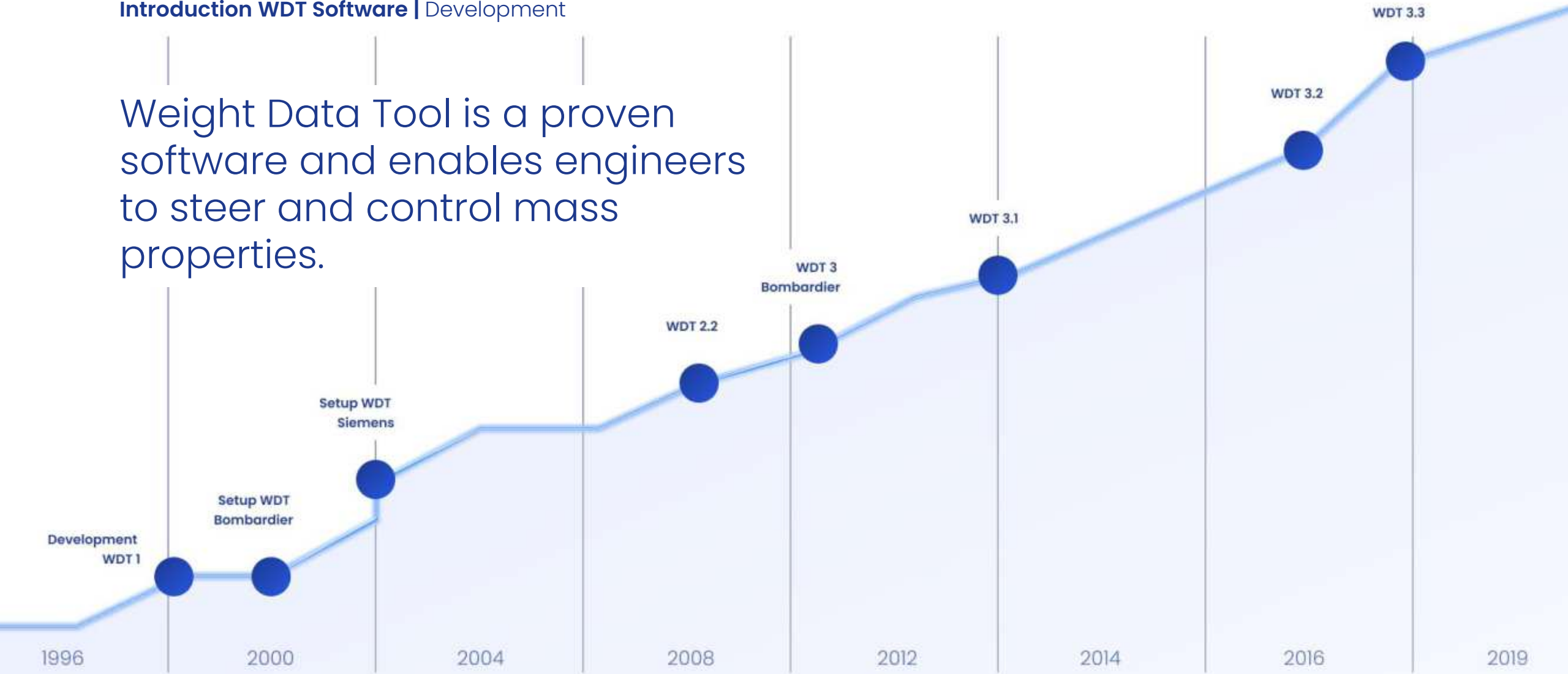
Derive a model



Perform mass properties analysis & weight management

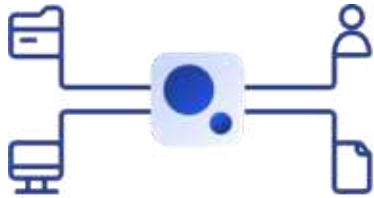
Introduction WDT Software | Development

Weight Data Tool is a proven software and enables engineers to steer and control mass properties.



Introduction WDT Software | Features and Functionality

Data storage



Database

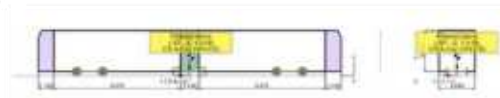
Multuser/Floating

Excel connectivity

PDM interface

Import/Export

Vehicle structure administration



Configuration Tool

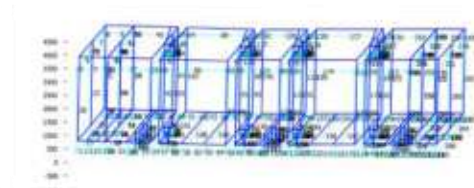
Variant Management

Platform & Modularity

Parametric Simulation

Master weight list

Calculation



Mass Properties

Forecast & Targets

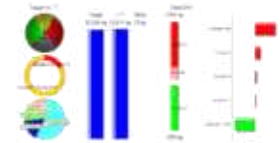
Weight Simulation

Load analysis

Payload analysis

Lifting scenario

Reporting



Templates

Risks & Opportunities

Outlook Reports

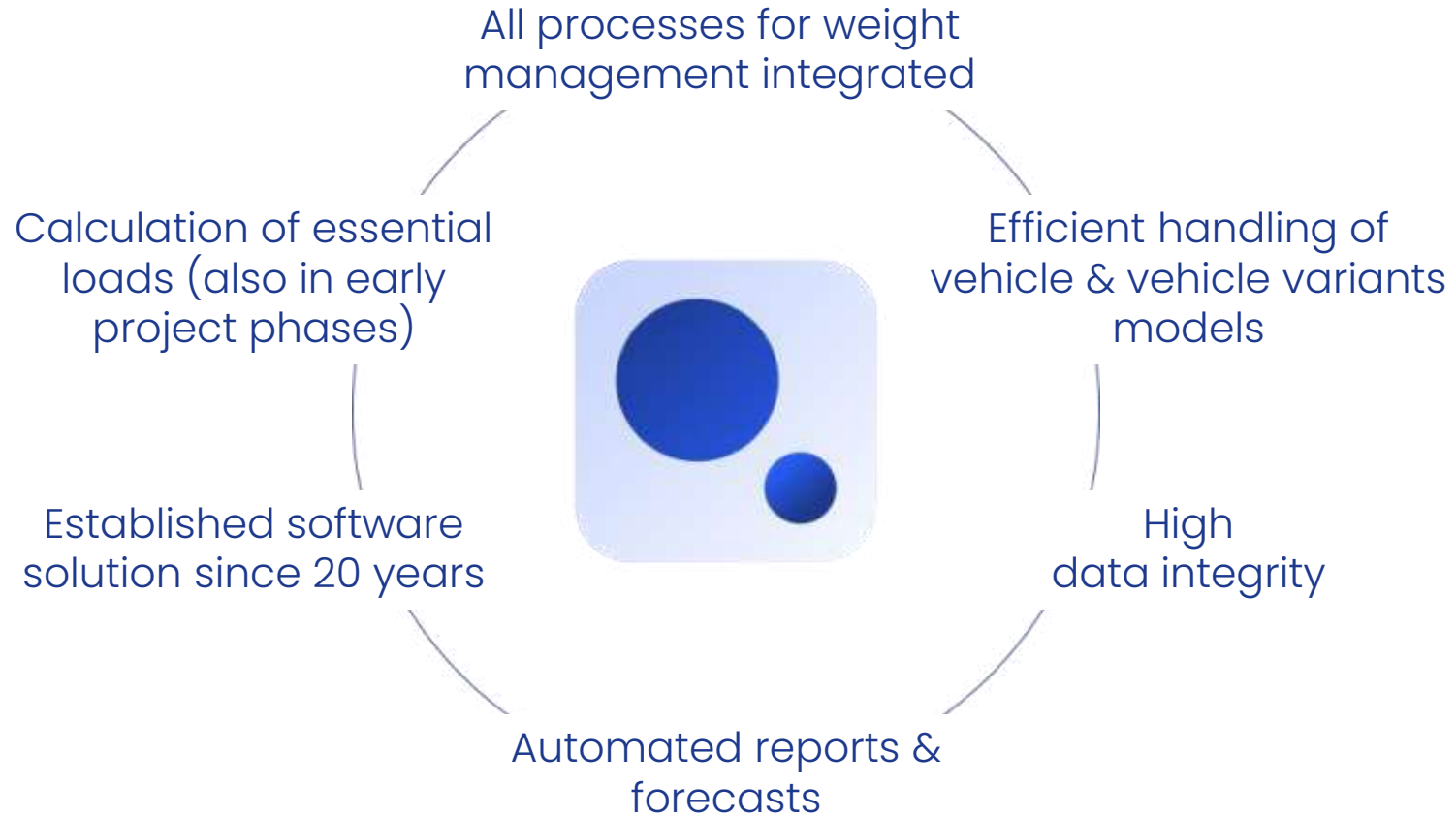
Dashboard



WDT is a standalone software tool for modelling, predicting and calculating loads and masses of vehicles.



Introduction WDT Software | Key features



Model vehicles

Calculate loads

Manage variants

Forecast mass properties

Report vehicle status



Reasons for the WeightDataTool

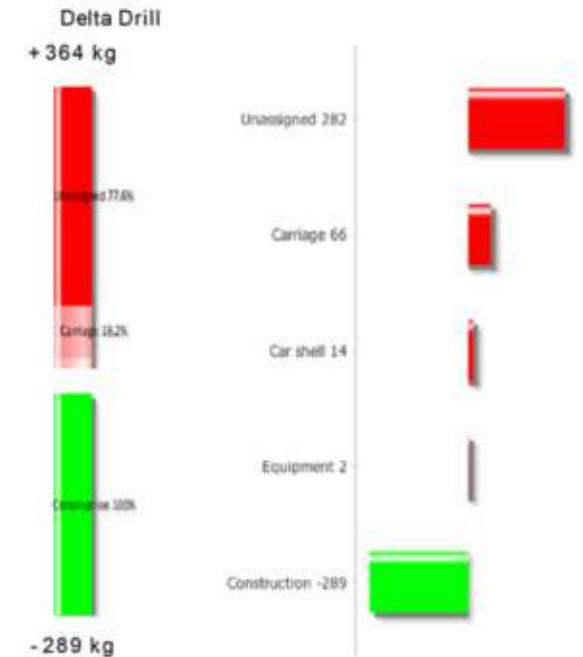


Common problems to solve in vehicle weight management

- ✗ **“Late Surprises”**
Sudden weight increase and design changes shortly before CDR or submission of a bid
- ✗ **No clear responsibilities**
for mass-properties
- ✗ **Inconsistency**
of mass, center of gravity positions, moments of inertia, secondary spring and axle loads not consistent due to unclear data origin and missing links
- ✗ **Input and formular errors in MS Excel**
when working across departments or locations
- ✗ **Lack of transparency**
with weight data and no traceability of weight changes

Reasons for WDT | Common Problems

- ✗ Very long processing times**
for different configurations especially in the offer phase (bid phase)
- ✗ Unavailability or unclarity**
of indications of origin, history and degree of maturity for mass properties
- ✗ Non-consistent or wrong definition**
of weight targets at vehicle and component level
- ✗ Unexpected costs**
due to lightweight construction measures that are decided too late
- ✗ No active tracking of risks**
Or countermeasures are not initiated
- ✗ Disregard of uncertainties**
like tolerances, estimates, calculations, weighing, configuration



Reasons for WDT | Licence Concept

WDT Light – Client Components Data Entry



WDT Rail Vehicle Weight Database



WDT – Client Weight Manager



Technical Director



50%
Time expenditure



**WDT is made
for engineers
with mass
responsibility
or managers
in charge of
the project.**

Our ideal user is:



either in charge of technical aspects such as weight management or axle/articulation loads or specific vehicle components (full WDT version)



or is in charge of managing projects or vehicle portfolios, configurations or project bids (light WDT version)

Reference projects



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ALSTOM

BOMBARDIER

 **HÖRMANN**
Vehicle Engineering

 **ŠKODA**

HARSCO
RAIL

STADLER



Reference Projects | Success stories



SIEMENS

- High speed trains/ railcars/ trams/ metro/ light rail vehicles
- ICE4 (High Speed)
- AVENIO (Tram)
- HF6 (Tram)
- S200 MUNI (USA)

HARSCO

- DB IFO (Utility Track Vehicles)

ALSTOM/BOMBARDIER

- High speed trains/ railcars/ double-deck-cars/ trams
- DO 2010 (Double Decker Train)
- ZEFIRO (Highspeed)
- LRV Flexity Outlook

STADLER

- METRO JK (Subway)
- Rocky Mountaineer (Double Deck luxury train)

SKODA

- ForCity Smart (Tram)



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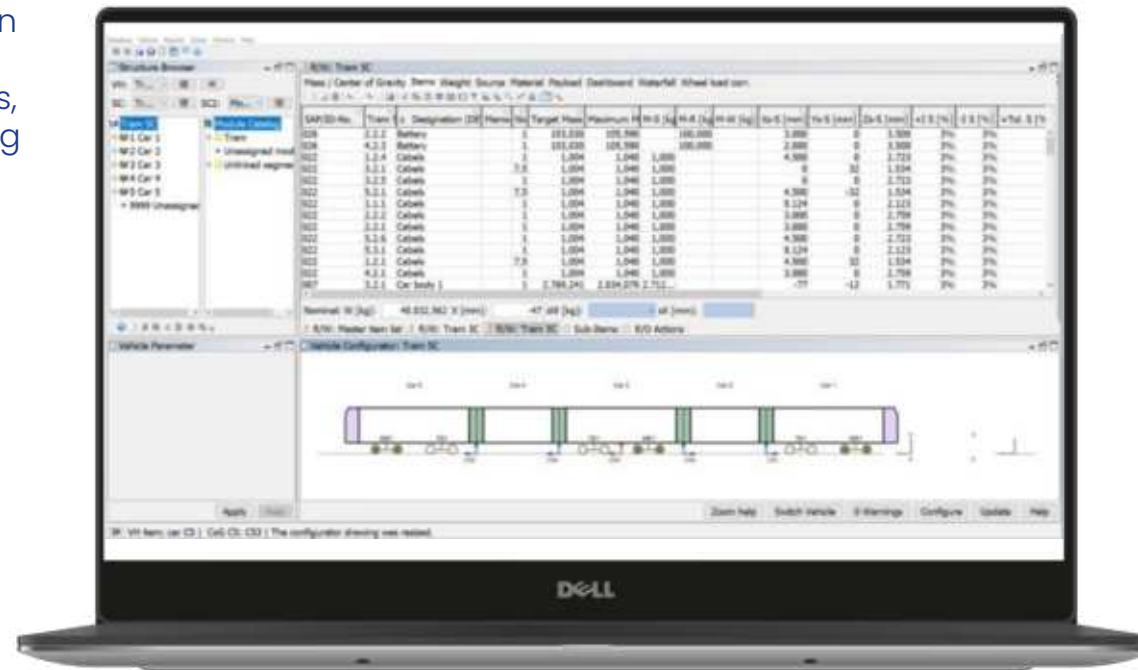
Use Cases & Live Demo



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Efficient modelling of vehicles

- Build a model of your railway in WDT by selecting from pre-fabricated modules, segments, and parts or by simply creating new ones.



- Add the dimensions and masses from your project easily and import data manually or automatically

Lower update effort

Ideally use one database with all parts and components

Efficiently calculate, among other things, axle loads, wheel loads or center of gravity

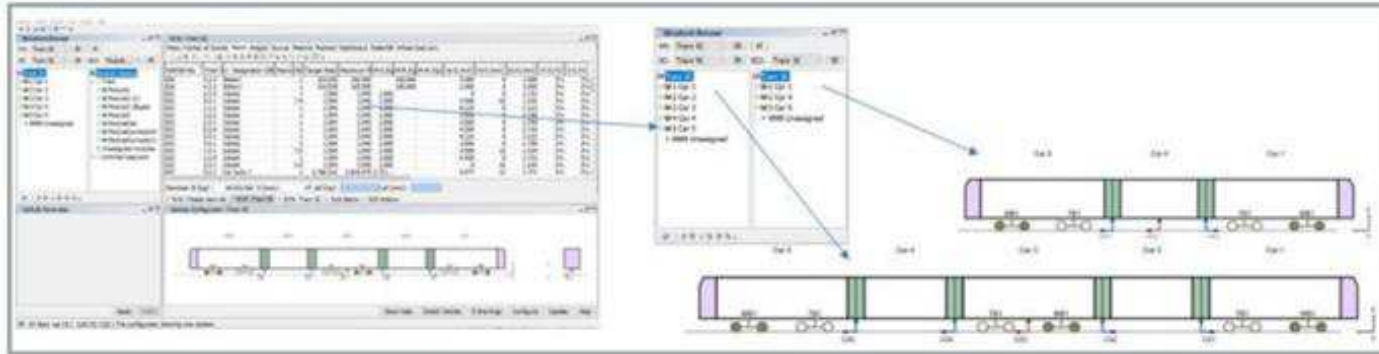
- Calculations possible in WDT for different weight scenarios (nominal weight, target weight, etc.)
- Several load cases (VDV 152, EN13104, EN15663, etc.)
- Axle and wheel loads
- Load on bogies



- Joint forces
- Moment of inertia
- Center of gravity
- Lifting scenarios
- FEM plots
- Output of results

Many important calculation results

Speedy creation of multiple vehicle variants with different options & efficiently sorting and combining the vehicle's data sources



Different variants can be organized in the variant editor of WDT. Each variant is put together by any desired number of modules (changes in the modules affect all variants.) Variants can also be scaled with the scaling option in all directions (length, height, width) and positions (X,Y,Z). The number of train sections can be changed from, for example, five to three. With that, experienced users can create new vehicles within seconds.

High configuration flexibility

Lower update effort

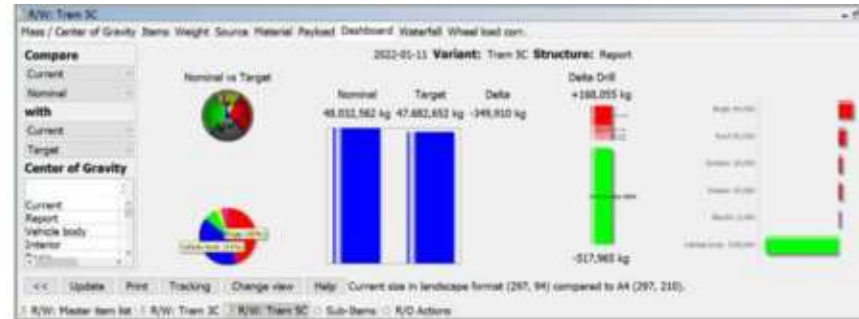
Easy comparison of different variants

Fast creation of different variants and options

Ideally use one database with all parts and components

Tracking changes in the projects

- Shows starting point of project and developments
- Forecasts weight data based on earlier projects or from newly built models including management of risks, opportunities, and tolerances



- Show all changes in waterfall diagrams and pie charts (see more in reporting)
- Create action lists, with and overview of all new or updated risks and opportunities

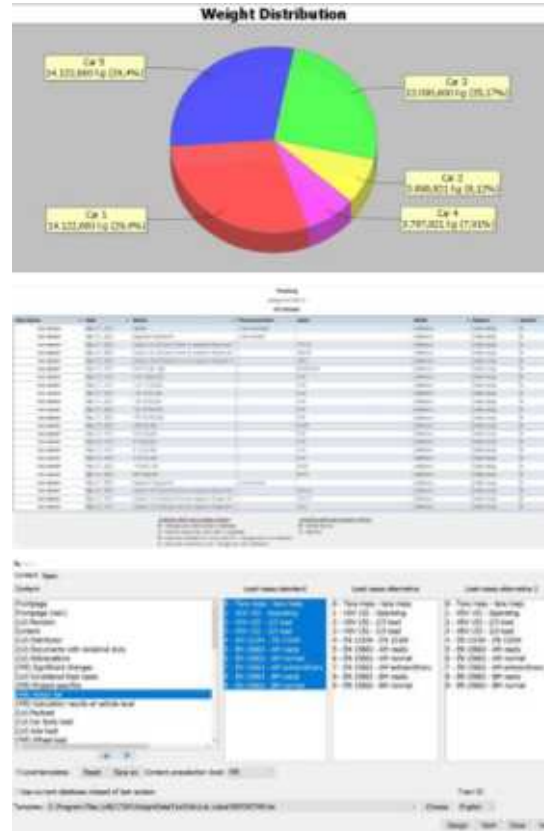


All information in single location

Awareness of changes and their impact

Tracking changes in the projects

- WDT offers extensive options for creating reports, on the weight levels of a single-vehicle and in comparison, to the other vehicles in WDT
- WDT reports can be used: simultaneously to the project, for tracking of activity, and for final reports
- Simultaneous reporting: dashboard, shows different states of the vehicle, etc.
- Waterfall diagram, shows all relevant weight data (e.g. vehicle weight, risks, opportunities, target weight, etc.)



- Weight distribution
- Tracking report: all changes to the individual parts of a vehicle can be traced back. You can edit as to which changes shall be traced. Tracking report will open upon loading of a vehicle
- Final report: reports can include the entire vehicle, as well as only structural elements
- Creation of reports and new templates (versatile, customizable, consistent) that can be used across multiple company sites

Fast export in every common format (e.g. HTML, PDF, MS Office)

English and German

Create offers for new clients fast

- Use an existing vehicle from WDT which is scaled and adapted to the customer's requirements
- Show comparisons to other vehicles (waterfall diagram, pie charts, etc.)



- Use all functions of WDT to improve your offer: use report and calculation functions of WDT for estimations (Weight forecast, Target weight, etc.)

Support for bidding process

Identification of possible weight issues (risks, opportunities, tolerances, etc.)

Possible optimizations/improvements can be prepared with a head start

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