European Commission

# Vehicle Design and Manufacturing


## *Roadmaps*

# In Brief

Transport vehicle design, development and manufacturing (VDM) is a collaborative, integrated and complex set of processes and tools that consider the whole vehicle life cycle and is a key element for the competitiveness of the European transport industry.

Continuous research and innovation are necessary for the seamless integration of digital and physical vehicle design and manufacturing processes, tools and infrastructures.

The Strategic Transport Research and Innovation Agenda (STRIA) *Roadmap for Vehicle Design and Manufacturing* aims to develop successful marketable transport vehicles with shorter development times.

# Current Developments

**Road:** Development time of new car models average 25 months but is expected to fall to below 20 months over the next decade. Suppliers need to be involved at the early stages of vehicle design process to eliminate inefficiencies along the whole value chain and achieve economies of scale. Advanced design tools and Product Lifecycle Management (PLM) software can play a key role in decreasing development and integration time while modularity facilitates progress that integrates physical and digital resources. In the automotive sector the main trends of VDM are:

- decrease in development time;
- development of advanced design tools;
- modular solutions;
- more integration in the supply chain;
- regulation-driven new technologies ;
- growing complexities of customized vehicles; and
- research, development and innovations.

**Waterborne:** The majority of modern vessels rely on some form of diesel engine for their prime propulsive power. However, the advantage of a hybrid power plant on lower activity levels could help reduce emissions and energy consumption. Another alternative is to use batteries as a temporary power source, resulting in zero emission cruising. A combination of diesel engine, generators and batteries allows the system to supply the required power more efficiently than a conventional diesel system.

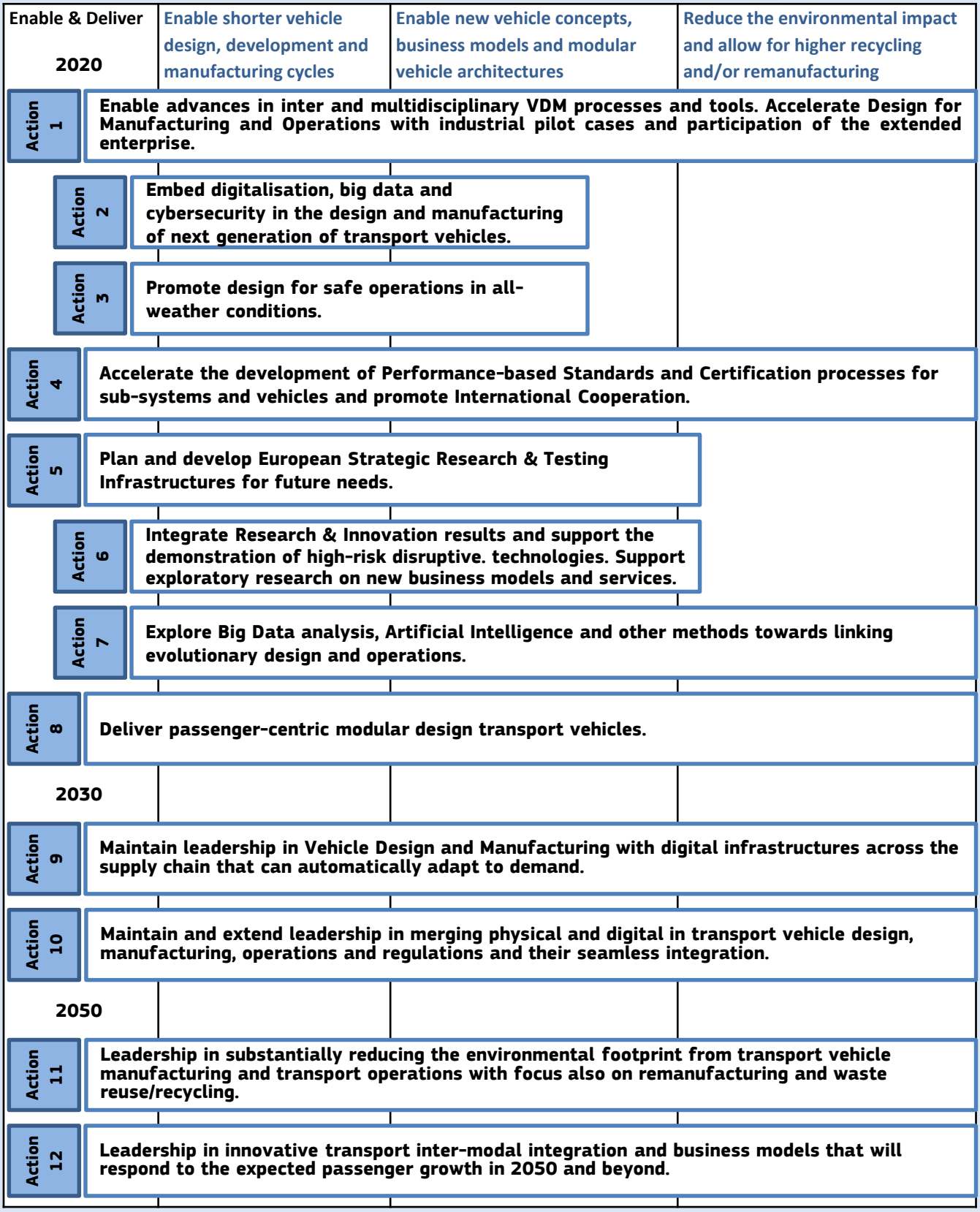
A shipyard's competitiveness is dependent on the level of production management together with Design-for-Manufacturing and Design-for-Assembly capabilities. The main trends in shipbuilding are:

- integration between digital design and digital manufacturing;
- manufacturing and production planning;
- new powertrain architectures; and
- temporary power source.

**Aviation:** Greater use of digital and data-based business models, advanced conventional and disruptive manufacturing technologies reduce entry costs to the aviation sector. The digital, zero waste, and energy-neutral factories will use data-driven manufacturing systems to ensure high productivity, permit rapid new technology implementation, and enable product and rate flexibility through supply chain integration. New design and manufacturing integrative approaches are necessary. The market demands ever-shorter cycles for technology integration and aggressive pricing. Main aviation trends are:

- fierce international competition;
- new business models;
- energy and environmental performance;
- shorter cycles for technology integration; and
- research and innovation support and investment proportional to the goals and global leadership.

# Key Research Innovation Pathways



# Transport Research and Innovation Agenda

The Strategic Transport Research and Innovation Agenda (STRIA) outlines future transport research and innovation priorities to decarbonise the European transport sector.

STRIA is one of five interlocking dimensions set out in the Energy Union strategy that provides a framework to achieve EU energy and climate goals. It supports the vision of a clean, connected and competitive European transport system.

In coordination with Member States and transport stakeholders, STRIA aims to set out common priorities to support and speed-up the research, innovation and deployment process leading to radical technology changes in transport.

STRIA builds on and integrates seven thematic transport research areas:

- Cooperative, connected and automated transport;
- Transport electrification;
- Vehicle design and manufacturing;
- Low-emission alternative energy for transport;
- Network and traffic management systems;
- Smart mobility and services; and
- Infrastructure.

STRIA is also the interface between other relevant sectors such as energy and information and communication technology.

# About TRIMIS

The Transport Research and Innovation Monitoring and Information System (TRIMIS) supports the implementation and monitoring of STRIA and its seven roadmaps.

TRIMIS is an open-access information system to map and analyse technology trends, research and innovation capacities, as well as monitor progress in the transport sector.

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