The development of automotive supply chains will be affected by various trends in the upcoming years. An increasing rate of purchases, production and sales volumes from developing countries leads to a shift of local structures. The transformation of the seller’s market into a buyer’s market affects the increasing demand for complex and individual vehicles. Sustainability and the development of alternative engines become increasingly important and push the dynamic process of innovation. The increasing pressure on cost efficiency throughout the supply chain leads to high demands for efficient networks, especially against the background of increasing uncertainty.

These challenges must be met with forward-looking planning, efficient management and innovative logistics concepts to make automotive manufacturing and its integration in supply chains sustainable for the future.

Against the background of the aforementioned challenges, the business unit of planning, control and logistics within the Fraunhofer Automobile Production Alliance offers solutions for the following key subjects:

- Planning and control processes: Efficient design and management of processes and production systems in complex automotive networks.
- IT systems and technology: Innovative information systems enable the exchange of large volumes of data and specific information for production and the whole supply chain.
- Logistics and SCM: Innovative approaches and technologies for efficient internal and external logistics as well as supply chain management.
The specific services and technologies offered by the alliance in this business unit are presented here.

**Planning and control processes**

In the future, it will be necessary to make production networks more versatile by forward-looking planning and efficient control. In particular, the 4th industrial revolution will require changes of planning and control concepts. To deal with the growing complexity and the need for versatility in automotive supply chains, special solutions for planning and managing processes, and production systems are offered by the Fraunhofer institutes. This includes especially the following topics:

**Order fulfillment processes**
- Holistic design and evaluation of the order fulfillment process
- Production program planning
- ATP/CTP
- Sequence planning
- Demand and capacity management

**Design of production systems**
- Lean Management
- Valuestream-oriented Factory
- Machinery and service management
- Total productive management (TPM)

**Global planning and management**
- Integrated product and process planning
- Process oriented management systems
- Supplier development

**IT systems and technology**

The interconnection and efficient management of global automotive networks requires innovative information systems across all levels of OT (e.g. shop floor level, MES, ERP, SCM). The alliance institutes offer solutions for data exchange and IT support for the following main topics:

**Model-based planning and control**
- Supply chain & material flow simulation
- Assistance systems for SCM & Intralogistics
- Digital factory and production

**Production control**
- Control and communication technology and systems
- Energy monitoring
- Fieldbus systems
- Automation technology
- MES
- OPC-Tools

**Identification and locating**
- Auto ID and RFID
- Telematic systems

**Data management**
- Content management
- Data mining and Big Data
- Web 2.0-tools
- Product data management

**Selection of automotive-logistics IT**
- Request for proposal and requirement specifications
- Tender management

**Image processing and evaluation**
- Innovative interaction technologies
- Automatic inspection

**Logistics and SCM**

Supply chains become more and more global and complex due to the steadily increasing globalization. This demands the design of close interactions throughout the supply chain. Therefore, the Fraunhofer alliance provides innovative approaches for efficient and sustainable internal and external logistics and automotive supply chain management. This especially includes the following main topics:

**Supply chain management**
- Design and planning of production and logistics networks
- Optimization of production networks
- Supplier evaluation and selection
- Training and management games

**Technology and automation**
- Material flow technology and automation
- Material flow planning and planning of logistics systems

**Production logistics**
- Structural and process optimization
- Factory organization
- Supply concepts for production

**Integrated management systems**
- Quality management
- Environmental management: Green Logistics
- Risk management

**Transport systems and management**
- Design and planning of transportation networks
- Multimodal transport