2 Overview of the Traffic – Vehicle – Transmission System

Communication and mobility are the prerequisites of all human interaction! /Walter Koch, 1980/

2.1 Fundamental Principles of Traffic and Vehicle Engineering

The interrelations between traffic and traffic engineering and the economy as a whole are as close as they are fundamental. Transport processes have a basic economic function similar to that of money, without which a modern economy, based on the division of labour and with complex system processes, cannot function. As an example of this interrelation, Figure 2.1 shows a constant increase in goods traffic performance, both universally and with reference to the population of Germany. The lion’s share of this goods traffic takes place on the road.

![Graph showing development of goods traffic and population in Germany](image)

Fig. 2.1. Example: Development of goods traffic and population in Germany; figures for the whole of Germany from 1990 [2.5, 2.14]

Automotive transmissions are a sub-system embedded within the transport system “road traffic”. This system is characterised by the following factors:

\[ \text{Person} \leftrightarrow \text{Vehicle} \leftrightarrow \text{Road} \leftrightarrow \text{Traffic Volume} \leftrightarrow \text{Goods in Transit} \]

There is a conflict of goals here that must be considered (Figure 2.2). If the individual wants to increase his or her own quality of life, this is only initially positive for the quality of life of society as a whole as well. Should everyone attempt to increase his or her own individual quality of life without compromise, the overall quality of life of that society will suffer. This conflict of goals is becoming especially obvious today in consideration of the traffic and environment issue.

On the subject of the Road Traffic Transport System, H. J. Förster writes as follows [2.7]:

“Since humanity, with all its wishes and needs, far outweighs all other interests, optimising the system is not necessarily the same thing as optimising transportation performance. Both people actively using the traffic system as well as others simultaneously suffer from its ill effects. Classic measures of transport effectiveness, such as transportation volume (passenger kilometres), and the cost and speed of travel, should therefore become secondary considerations. Priority has to be given to more complex human criteria such as journey quality, human satisfaction, and especially environmental impact. For goods traffic however, economic factors such as transportation volume (tonne-km), transport costs (cost per tonne-km) and journey speed (km/h) continue to outweigh considerations of social and environmental impact.”

![Fig. 2.2. Relationship between the quality of life of a society and that of an individual](image-url)