

Towards 2222, science fiction or an educated guess for the design of bridges?

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1 Abstract

About 200 years ago the first railroad bridges were build, followed almost 100 years later by bridges for cars and trucks. Since the first cars and trucks, traffic has changed. Up to now this change is mostly an increase in intensity and axle and gross vehicle weight of trucks. But soon mobility will change.

When designing a bridge for a lifespan of 200 years there are a lot of uncertainties to deal with.

Will there be more vehicles due to easier transport, or will there be less because of a reducing population, virtual reality and robotics? There are a lot of construction activities going on in the world, but when will this change and what is the impact on mobility and transportation? The innovation in technology will change the use of the transport, which will make it more efficient, but is this also efficient for bridges? And what will be the effect of renewable energies and reducing CO₂ on the usage of bridges? A lot of unknowns and only future will tell us what exactly will happen.

In this paper we give some scenarios on possible changes in the near and far future and how this can possibly influence the way we design our bridges today.

Keywords: Bridges, Future of design

2 Introduction

After the invention of the steam engine, the first commercial railway lines were built some 200 years ago. These railroads had a tremendous impact on society and economy. With railroads it was possible to move people and goods more quickly. In the first decades after the introduction of the railroads a vast amount of railway bridges were built. Still many (of at least) the substructures of these bridges exist.

Almost a century after the first railroads the development of the motorway network started. With especially in Europe a building pause during and directly after the second World War the motorway network expanded tremendously. This resulted in a change in mobility from rail and tram transport to car and truck transport.

These developments can be compared with the S-curve of innovation and performance over time, as illustrated in Figure 2.