

Road design and landscape integration in the past, present and (near) future

Summary:

The Romans were the first to realize a planned road network and to pave their roads.

After the fall of the Roman Empire, the realization of paved roads stopped. Until Napoleon, most goods and people were transported on unpaved paths/trails. Napoleon (around 1800) started a policy of planning the road network again. In the Netherlands, King Willem the 1st continued this policy. Because of their clear design principles, these old main roads are still recognizable in the landscape.

The Dutch Road Authority (Rijkswaterstaat) started the realization of a national motorways network in 1935. Nowadays, the network is almost completed. The Rijkswaterstaat focus lies on the realization of missing links and widening existing motorways.

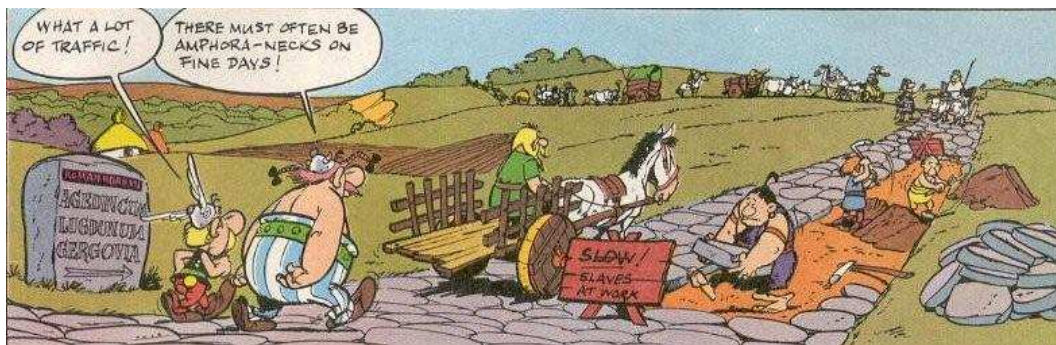
For a long time, the expansion of the road network was seen as positive. Nowadays, there is also awareness of the negative effects (noise, particulate matter, carbon dioxide etc.). Because of that, the design of motorways has become more complex.

Motorways are a magnet for areal developments. Spatial quality not only depends on the road design but also on the spatial quality of the motorway surroundings.

Unfortunately, motorways and their surroundings are rarely designed in an integrated spatial approach. Often this results in disorder and poor spatial quality.

Conclusion is that the design of road and surroundings is an integrated task for areal development.

Roman roads



Roman roads are paved and spread in a straight line



Via Appia: old pavement



Ruins along the Via Appia

Old main roads (Napoleon's routes and national roads)

The design principles for old main roads are:

- from church to church (village centre to village centre)
- horizontal alignment: straight line with few curves, usually planted with rows of trees on both sides
- vertical alignment: delayed following the ground level
- cross section:

Though these principles the old main roads are still recognizable nationwide



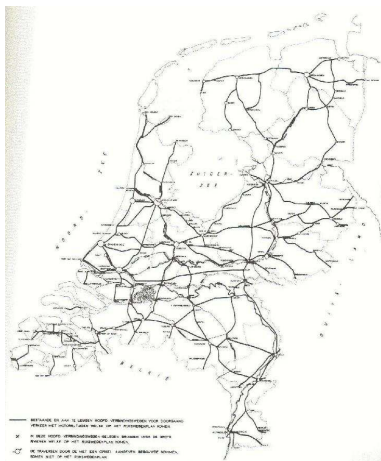
Eindhoven - Den Bosch



Ittervoort - Haelen

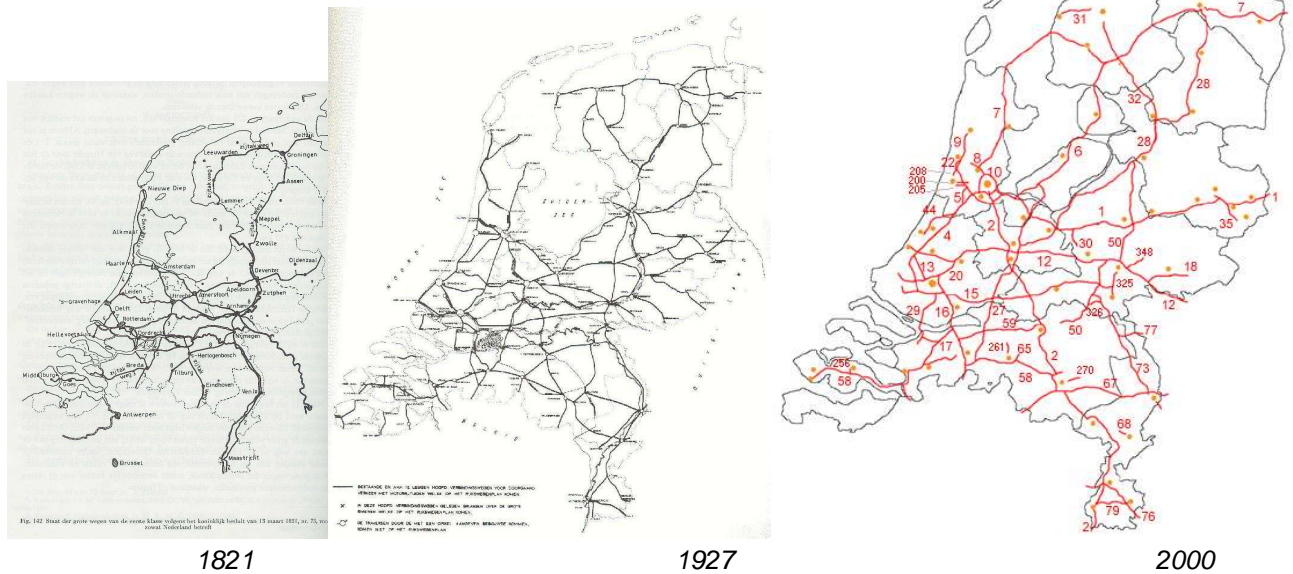


Arnhem-Elst



1st National road plan 1827 (excl. Belgium)

Transformation towards a network of motorways



In the fifties, sixties, seventies a network of motorways was developed.

In the early days of the motorways network, road infrastructure was seen as positive, a key to areal development and prosperity.

Also in those days the network was mainly approached as a traffic and transport issue and not as catalyst for areal development.

But in the slipstream of the road development, there was attention for the quality of the landscape integration of landscape and motorway:

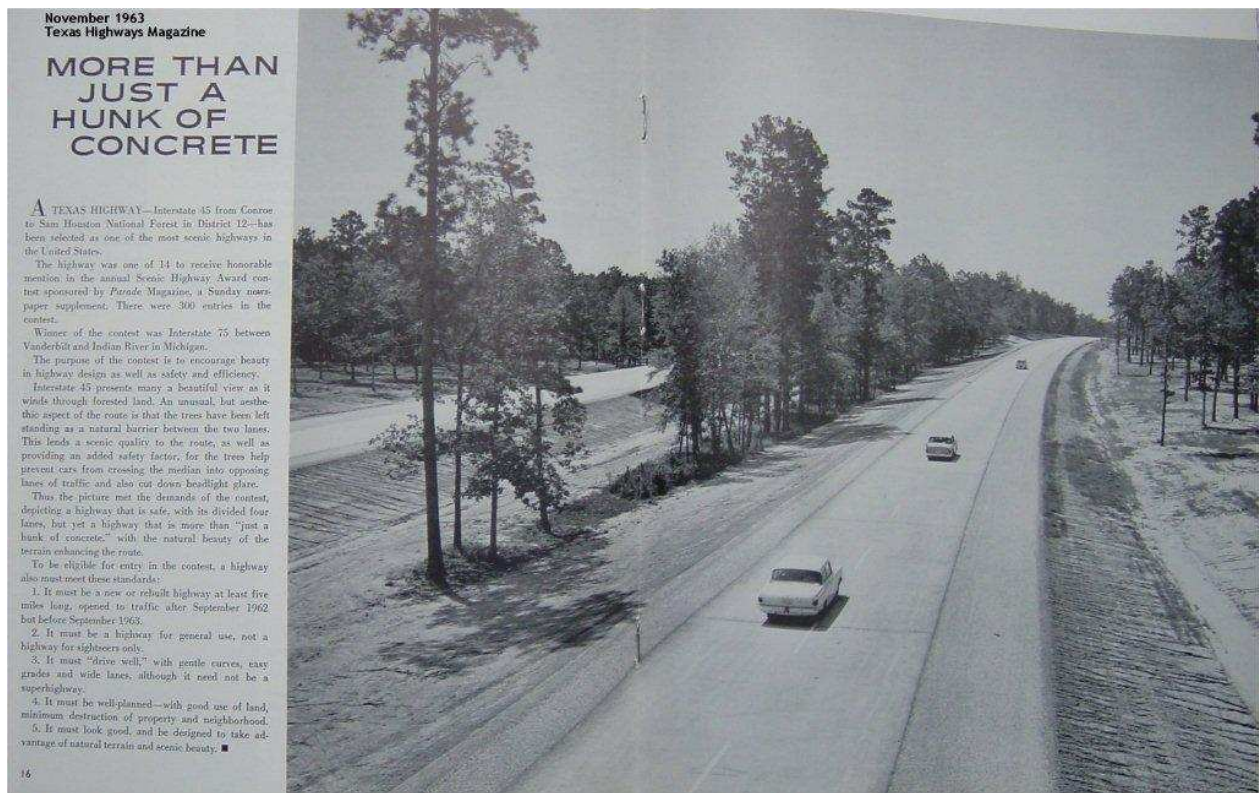
- alignment not only the straightest line from A to B.
- collaboration of the civil engineer (responsible for the road design) and landscape architect (responsible for the integration of road and landscape) but mostly not in an integrated concept.



A28, cleaving the Veluwe, the largest forest area of the Netherlands

Parkways and Autobahnen

In the Netherlands the inspiration for road design and landscape integration are the Parkways and Autobahnen.



Texas highway, interstate 45



Designprinciples autobahn

- interplay between horizontal and vertical alignment;
- broad integrationzone;
- spatial perception of an idyllic landscape (Bayrisches landschaft) was important.

Some good examples of road design and landscape integration:



A12-A50 intersection Waterberg: because of the natural surrounding with fly-unders



A59 near Nuland: rows of oaks in the central reservation, which refers to the old main road

Motorways increasingly seen as negative

In the eighties and nineties the motorways network was almost completed. Development was that motorways were not only seen as positive anymore, but also increasingly as negative. For this, measures were necessary regarding:

noise:

- source measures on the road
- source measures on the car
- noise barriers, noise screens, earthworks

ecology:

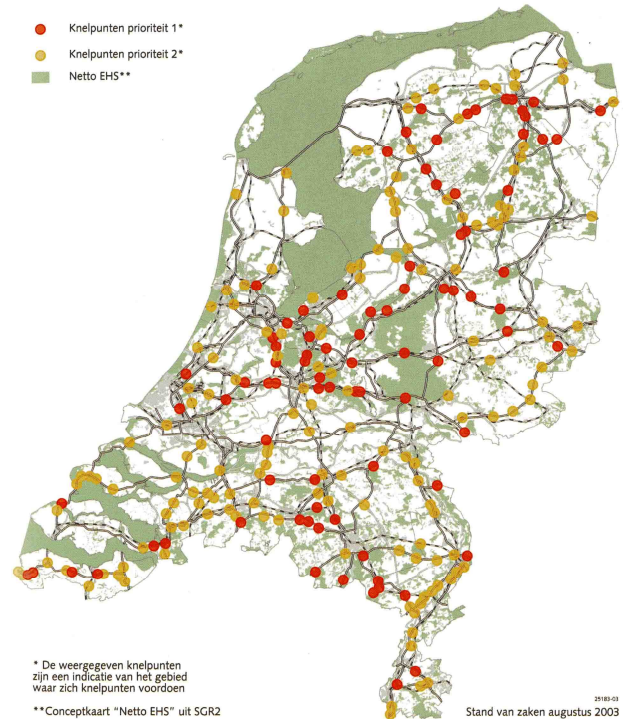
- avoid
- mitigate
- compensate

particulate matter:

- source measures
- absorbing screens
- roofing

vandalism:

- fences



Conflicts between infrastructure and the main ecological structure



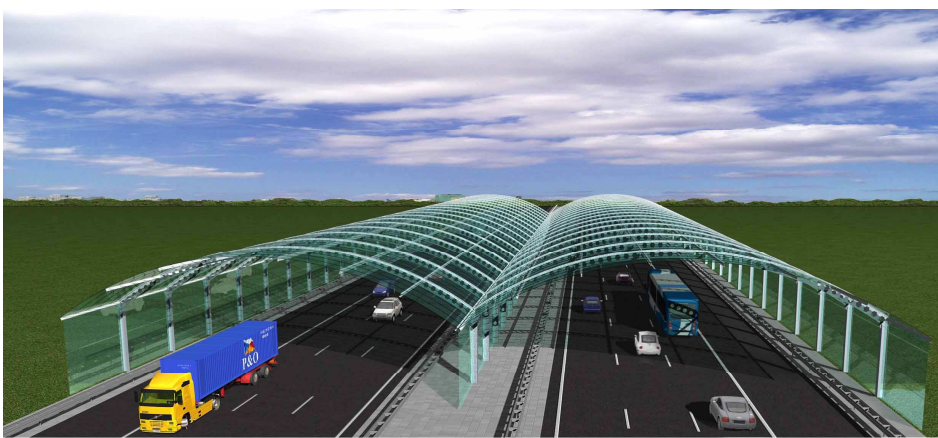
Protests against the A27 through Amelisweerd



A12, modular noise screen



A73, Nature compensation slogan: new roadnew nature



Movares

Overhuiving Snelwegen

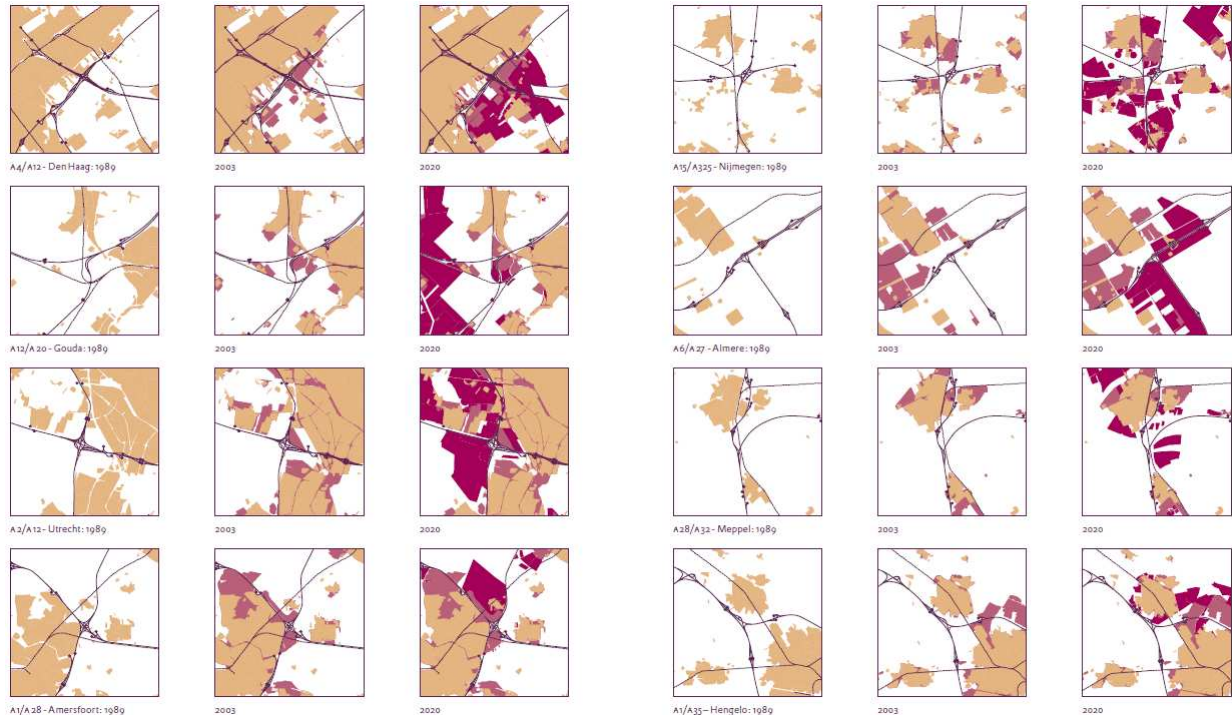
BRS STRUCTURAL GLAZING

Roofing as a solution for the fine dust problems (not realized yet)

The motorway as magnet for areal development

Motorways seem to be a magnet for spatial, areal development: offices, business parks, transport- and distribution firms, windmills cluster around the motorways network.

The figure underneath shows the growth of areal development around motorways from 1989 and 2003 (light red colour) to 2020 (dark red colour).



Areal development around motorways

Because of the lack of an integrated approach, of roads and its surroundings, this has resulted in:

- sometimes disorder and
- mostly poor spatial quality



A37, Emmen



A12, near Zoetermeer

Conclusion

To realize spatial quality within areal development road infrastructure and its surroundings should be seen as an integral design task.

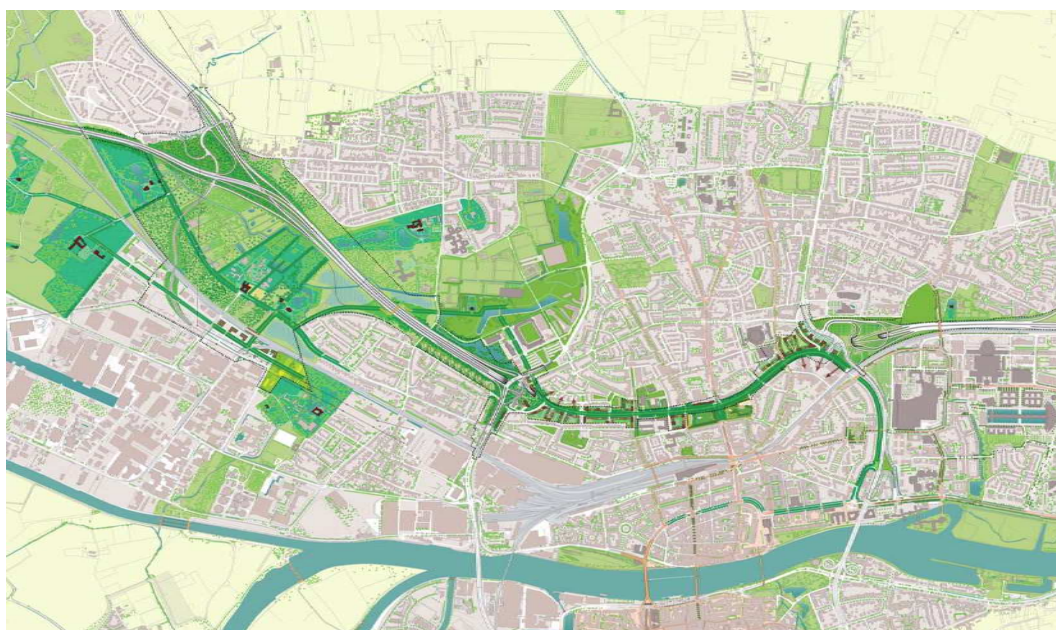
Road, verge and field together define the spatial quality of the motorways.



Good examples of integrated areal planning:



A2 Utrecht, the Cockpit: a showroom integrated in the noise screen



A2 Maastricht, tunnel project combined with urban planning