Danish Road Institute
- We know the way
Colophon
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We know the way
This brochure paints a portrait of the Danish Road Institute as centre for knowledge throughout the Danish road sector.

Tradition In the year 2008, the Danish Road Institute turns 80. A long, proud tradition and constant development is the recipe for being up front in many areas of road technology.

Mission We wish to make the Danish roads greener, safer and smarter for the benefit of society. Our mission is to fight for a cleaner environment, for traffic safety and for the roads to live up to the demands for mobility made by society.

Vision The slogan “We know the way”, indicates that we can answer almost every question on road engineering. Also we are aware of and ready to handle future challenges.

Sincerely
Gert Ahé
Director of the Danish Road Institute
The Danish Road Institute

The Danish Road Institute has its roots in the years between the two wars, when road traffic had great growth. In 1928, the Interior Ministry established the Danish Road Laboratory, which at the time had its offices at Christiansborg Castle. As more cars came to Denmark and greater demands were made on the road properties, the laboratory expanded and moved, and in 1972 it became a part of the Danish Road Directorate.

In 1983, the activities were moved to Roskilde and in 1994 it was renamed the Danish Road Institute, which now has its offices in Fløng together with the Area Centre for Greater Copenhagen. The Danish Road Institute also has offices in Skanderborg and Middelfart and has a total of some 80 employees, still including a laboratory as an important element. But it also has competent and professional consultancy, measurements, testing as well as research and development.

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Spreading of know-how
Road construction and maintenance face expensive and complicated challenges; the Danish Road Institute contributes to solve these in the best possible way.

A well-constructed road network should be able to offer the road users the shortest possible travelling time. This requires that already at the time of construction of new roads, future maintenance as well as climatic and safety issues are taken into consideration.

The Danish Road Institute has followed the developments of methods, materials, systems and strategies for the last eighty years and we try to do our utmost to ensure that construction and maintenance is done on the best possible foundations.

Thus the Danish Road Institute has a broad range of qualifications which focus on many years of experience, such as choice of materials, which are cost-effective and innovative.

Our staff members have wide experience; from laboratory technicians, who quality-approve materials to engineers who develop new types of asphalt, to measuring technicians who drive all over Denmark to ensure that the standards are ok.

We also carry out teaching and consultancy, hold seminars and participate in conferences and we are recognised both in Denmark and abroad for our great knowledge in the areas of: noise, environmental questions and material technology.

What’s happening at the Danish Road Institute

The Danish Road Institute targets its competence in relation to three basic values:

Greener
- Adjustment to climatic changes
- Environmentally friendly roads
- Noise-reducing pavements
- Raw materials

Safer
- Strong roads
- Even roads
- Comfortable roads
- Reliable roads at all times of the year

Smarter
- Economic roads
- Intelligent roads
- New ways of tendering

A handful of qualifications

A handful of qualifications

A handful of qualifications
Many ways to knowledge

Wide cooperation
Our knowledge on roads does not come to us on its own accord. The Danish Road Institute is constantly on the watch for new ways to solve the tasks of the road sector. We always keep in mind to upgrade our own qualifications and to cooperate with many actors.

In Denmark, our partners count technical universities, the Danish Environmental Protection Agency, Denmark’s Meteorological Institute, municipalities and contracting and consultancy companies.

Internationally, we cooperate with sister organisations, universities and a large number of European and overseas road authorities.

The Danish Road Institute takes part in the European research programmes, also called Framework Programmes.

Research among EU countries
“The European Research Arena” or ERA is an international network cooperation in which the Danish Road Directorate participates actively. The project has the aim to establish transnational research programmes, which meet common, strategic goals.

The Danish Road Institute participates in projects on climate and environmental matters under ERA-NET Road.

Partners
Exchange of know-how keeps us updated on the latest development in the international road sector.

PARK Worldwide road cooperation, also known as WRA.
FEHRL Forum of European National Highway Research Laboratories.
CEDR Cooperation of European Road Directors
ISAP International asphalt organisation
CEDO Organisation for Economic Cooperation and Development
WVF Cooperation between the Nordic road sectors
TRB American organisation for road research
TRA European cooperation for road research

Knowledge flow
The Danish Road Institute collects, develops, shares and disseminates knowledge on roads to the Danish and international road sector.

The Road Sector’s Library, which is at the Danish Road Institute, has a large collection of Danish and international literature.

The library can help internal and external users with literature searches in specific data bases.

Our research results are presented in reports, on homepages, in articles and at seminars and conferences at home and abroad and also through teaching through the Road Sector Training Centre.
Rocks of high quality

Measurement and laboratory testing
The condition of the road network is important for the mobility of society.

The Danish Road Institute carries out quality control of road materials before, during and after construction works.

This is done in our laboratory and by measurements with our measuring vehicles in the field.

At the same time, good control systems ensure good cooperation between the producers, suppliers and contractors.

We also play an important role in the development of new Road Standards and standards for road materials.

White spot technology

Each year combating icy roads costs the Danish society many million Danish crowns. But each time we can avoid unnecessary salting we save society and the environment huge costs.

The Danish Road Directorate participates in the general winter surveillance of the Danish Road Directorate and delivers equipment and know-how which contributes to correct salting of roads.

The work takes place in connection with the Danish Meteorological Office and www.trafikken.dk and thus helps to improve traffic safety.

Advanced IT systems play a large role in the running of our roads. The Danish Road Institute continues to develop equipment and methods so unnecessary salting can be avoided.

These measuring stations can be recognised in the open countryside as boxes or cylinders.

The measuring stations are generally situated at “white spots”, which are those parts of the road network which first become icy.

White spots occur many places as a result of cooling of the road surface and its surroundings. A white spot can, for example, arise on bridges across gullies early in autumn as a result of special cooling due to certain wind conditions.

Example of a bridge across a gully, containing a measuring station

Station on a winter day
The masters of measurement

The Danish Road Institute has a large number of measuring methods. They have been developed to quality control the Danish road network and the methods and materials which are used during construction and maintenance.

Measuring methods

The High Speed Deflectograph can be mentioned which makes measurements of the bearing capacity of roads at high speed, DeciBellA, which measures tyre/road surface noise, the Video vehicle which takes photos of the road for maintenance purposes and ARAN, which registers the evenness, cracks and texture of the road.

Good advice pays off

The Danish Road Institute delivers consultancy services and measurements which support the use of vejman.dk at the municipalities and for use on the main road network.

The measurements are used in vejman.dk as a tool for the Danish Road Directorate and in the municipality to plan maintenance at the right time in the right place.

With the system the municipal case worker can fetch data about the road network to carry out analyses and plan road maintenance.

ARAN is short for Automatic Road Analyzer. A fine piece of measuring equipment.
Climate and environment are important focal areas in the Danish Road Institute. The climate has in recent years given more frequent storms and more intense rainfall. Adjustments during construction and maintenance are required due to climate changes. This is a known problem for the road sector. We are aware that it has become a more pressing problem.

The Danish Road Institute is carrying out research and development projects which have the purpose of advancing greener roads that can adjust to climate changes.

Even and durable roads with good friction are one way to increased road safety. The more durable a road is, the less maintenance will be required and the fewer dangerous situations for the road worker and the road user will occur.

The Danish Road Institute carries our research in longlife pavements friction properties for various types of roads. We also carry out measurements and registration of uneven roads or in other way unsafe roads.

Innovation in the road area can give savings for society. The Danish Road Institute develops smart solutions, which ensure a fast laying of asphalt. Other research projects examine the possibility to use materials, which already can be found in the vicinity of the road construction project. We develop new types of road materials, which put as little load as possible on the environment and which take the local geology into consideration, so that unnecessary transportation can be avoided.

Activities

Friction measurements in cooperation with the Norwegian Road Directorate.
Climate is our responsibility

Focus area
The Danish Road Institute is in the process of evaluating where road authorities should play their part in solving the important task of keeping roads safe, environmentally friendly and functional.

It is a common task for the road sector to commit itself to the climatic challenges in all phases of the road administration with regard to tackling actual incidents and to treat the environment close to the road in a responsible manner.

Actions carried out in time within research and development on climatic changes contribute to advancing roads with are robust and functional, and provide for safety, passability and durability. We will be able to document the efforts to our users and customers, so our contribution becomes visible and known, also in the world around us.

Will climate changes affect the roads?

Where is there a need for more precise know-how?

The climate has in recent years given more frequent storms and more intense rain. Warm summers allow plants to grow, but also require that retention ponds are maintained.

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Traffic noise
on the record

Noise reduction
One of the focal research areas at the Danish Road Institute is the influence from road surfaces on road traffic noise.

We work with new pavement materials in collaboration with international road organisations.

An example is to be seen at Øster Søgade in Copenhagen. A two-layer drainage asphalt reduces the noise by up to 6 dB.

The project is carried out in cooperation with the municipality of Copenhagen and the Association of Danish Asphalt Industries.

Since 2003, a number of municipal roads and motorways have been involved in noise reducing projects.

As a part of the experiments, people who live near by a major road are interviewed about their experience of noise.

Facts on:

A noise difference of 3 dB is clearly audible.

A noise reduction of 8-10 dB is experienced as a halving of the noise level.

About 28% of Danish housing areas have a noise level above the advisory level below 58 dB.

Property prices decrease by 1.2% per dB when the noise level is above 58 dB. This problem can be solved by using a noise reducing thin layer pavement.

Left page: Noise is recorded with sensitive equipment.

Right: “DeciBellA” is the name of the trailer. It has microphones mounted to measure the noise from tyres.

Economical consequence

Traffic noise
Road traffic is the most common source of noise. It is often considered a problem in densely populated areas.

A reduction of hazardous noise levels will decrease costs for treatment and lost working capacity.

In Denmark, it is thought, that 800-2200 people per year receive hospital treatment for high blood pressure, heart disease or stress caused by the effect of noise.

Health related costs of medicine, doctors’ visits and treatment at hospitals are expected to be around 40-100 million crowns per year.

Traffic noise
Road traffic is the most common source of noise. It is often considered a problem in densely populated areas.
In recent years, the Danish Road Directorate has carried out experiments with lime as a stabilising layer on soil and clay. The tests were made on road stretches, where the soil in the subgrade was too wet and soft to construct a road.

The environmental and economic gains by using lime as a stabilising material are roughly calculated to be around 1 million crowns per kilometer of motorway. At the same time, this method uses fewer resources and the lifetime of the road is longer.

The Danish Road Institute tests new materials and the knowledge obtained is of great advantage for road construction projects.

During two sunny days in late April 2007, the first part of an experiment was made at a pull-in in western Zealand. The purpose of the experiment was to document the use of new materials to repair holes in the roads. Jeanne Rosenberg, an engineer at the Danish Road Institute, is in charge of the project. She managed to gather nine competing contractors for her project. This made it possible to examine the contractors’ suggestions for new materials to repair holes.

The process of mixing materials and fixing the holes was documented by Jeanne Rosenberg and her team of scientists.
Meet the Institute

Department of Administration

The Danish Road Institute employs around 80 people in three locations, strategically placed in Denmark.

Our products and services are based on assignments from the Danish Road Directorate, construction and maintenance of the main roads in Denmark. However, there is also a market for us in the Danish municipalities and as participants in international cooperation projects.

Our staff and our departments work closely together to ensure an all-round expertise and to gather and disseminate knowledge to each other and to the Danish road sector. Our organization three production departments and three thematic projects is designed to ensure this cooperation.

For general questions please contact our Communication Consultant, Mikkel Bruun at +45 7244 7133 or mibr@vd.dk.

Department of Research, Development and Demonstration

The department produces knowledge on road materials and environment for all players in the road sector and ensures also that methods and technology reflect the latest development.

The efforts of the department are mainly in the fields of material technology, noise and climate.

The Road Sector Library is a part of this department.

Department of Measurements and Data Treatment

The department delivers technical consultancy on tenders, construction and maintenance of roads.

Measurements are carried out for use in the planning of road maintenance and in the evaluation of traffic safety, passability, durability and comfort, etc.

Department of Laboratory and Electronics

The department delivers laboratory testing on road and bridge materials. The laboratory is also the reference laboratory for such materials. Furthermore, electronic measurement and communication equipment is developed, i.e. for warning of icy roads.

The results are produced for the Danish Road Directorate and the road sector.

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