ROADS AND HIGHWAYS

COWI

CREATING COHERENCE IN TOMORROW'S SUSTAINABLE SOCIETY

The planet's increasing population, a growing middle class and the trend towards urbanisation together place new pressure on existing infrastructure.

As new cities emerge and existing cities grow into megacities, the number of cars and highways also booms. Solving the problem of traffic congestion calls for effective transportation solutions, long-term traffic strategies and careful urban planning.

Add to that the ever clearer effects of climate change in terms of flooded roads and cities, and the task is clear: We need to find coherent, forward-looking infrastructure solutions that optimise mobility and takes climate protection and water control into account.

As a result, transportation projects are growing in size and complexity. In COWI, engineering and other technical disciplines form interlocking pieces of the puzzle, to create a future-proof 360° solution that meets our customers' functional and financial requirements while respecting the surrounding community and stakeholders.

COWI offers world-class competencies in a wide range of environmental, planning and engineering services for road transportation. As a Scandinavian-based company, we have a long tradition of creating smart designs and reliable transportation solutions, supported by new technologies and digital tools, as well as close dialogue with our customers and partners.

With more than 6,300 people in offices around the globe, we put together multidisciplinary teams best suited for your project.

REHABILITATION OF THE TANZAM HIGHWAY – TANZANIA – RECONSTRUCTION OF THE NORTHERN CORRIDOR ROUTE – UGANDA – ARUSHA – BY-PASS REHABILITATION – TANZANIA – UPGRADING OF LIKONI ROAD JUNCTION KENYA – UPGRADING OF THE TABORA-KOGA-MPANDA ROAD – TANZANIA – UPGRADING OF THE MATUGGA-SEMUTO-KAPEEKA ROAD – UGANDA – CHALINZE-MOROGORO-MELELA ROAD REHABILITATION PROJECT – TANZANIA – RECONSTRUCTION OF THE BEIRA-MACHIPANDA ROAD – MOZAMBIQUE – UPGRADING OF THE DODOMA-IRINGA ROAD – TANZANIA – KAMPALA-ENTEBBE ROAD – UGANDA – BRANDERIIS MOTORWAY – DENMARK – ASSISTANCE TO THE PMU OF THE CZECH ROAD AND MOTORWAY DIRECTORATE (RMD) – CZECH REPUBLIC – TECHNICAL AUDIT OF ROAD SECTOR PROGRAMME – MOLDOVA – UPGRADE OF THE MEKELE-ABI ADI-ADWA ROAD PROJECT – ETHIOPIA – REHABILITATION OF POSÉ-KETOU ROAD – BENIN – ARUVALLA-KOSE ROAD – ESTONIA – REHABILITATION/UPGRADING OF THE KUMASI-KONONGO ROAD – GHANA – UPGRADING OF SINGIDA-BEREATI-MINJINGU ROAD TO BITUMEN STANDARD – LOT 2: KATESH-DAREDA SECTION – TANZANIA – NACALA ROAD CORRIDOR PROJECT – REHABILITATION OF THE GREAT EAST ROAD (T4) – INSTITUTIONAL SUPPORT AND CAPACITY BUILDING COMPONENT – ZAMBIA – WIDENING OF M14 ELSINORE – MOTORWAY – DENMARK – SUPPORT TO LATVIAN STATE ROADS AND LITHUANIAN ROAD ADMINISTRATION – FORMULATION STUDY – KENYA – BRANDE BYPASS ROAD – DENMARK – UPGRADING OF THE NZEGA-TABORA ROAD – TANZANIA – STRENGTHENING AND TRAFFIC SAFETY IMPROVEMENT OF CHALINZE-SEGERA-TANGA ROAD – TANZANIA – UPGRADING OF THE ABOBE-GODERE METI ROAD – ETHIOPIA – DAR ES SALAAM-BAGAMOYO ROAD UPGRADING PROJECT – TANZANIA – MBARARA-KIKAGATI-MURONGO BRIDGE ROAD-DESIGN & BUILD CONTRACT – UGANDA – REHABILITATION OF THE WUKRO-ADIGRAT - ZALAMBESSA ROAD – ETHIOPIA – KAMPALA TO FORT PORTAL ROAD – MITYANA-MUBENDE-KYENJOJO ROAD UPGRADING

WHY CHOOSE US?

YOUR GLOBAL PARTNER

COWI is a leading international consulting company building on a long and well-established history of creating reliable and sustainable transportation solutions for customers.

With more than 6,300 employees in countries around the world, we draw on both our international experience and in-depth local knowledge, including insight into local legislation and authorities.

Combining our world-class competencies with a continuous and open dialogue with our customers and other involved parties, we optimise each step in the process and ensure that the project will reach its full potential.

CONCEPTUAL DESIGN OF A VITAL LINK

Iraq

Expressway No. 2 is not only the main route linking Iraq's southern and northern regions; it is also the overland route connecting Europe, the Gulf and East Asia. It is a vital infrastructure link and the backbone of Iraq's development, offering a cost-effective alternative to the Suez Canal.

The six-lane wide expressway is 507 km long. It includes four-lane access roads to six cities and 25 interchanges. COWI was responsible for the conceptual design and construction cost estimation.

The client worked very closely with COWI at every stage of the project, maintaining daily contact with COWI's local team, who also managed surveying and data collection for the project.

FACTS

› Project name:	Expressway No. 2
› Project period:	2012-2013
› Client:	State Comission for Roads and Bridges (SCRB) under Ministry of Construction and Housing, Iraq
› Partner:	Muhel Consulting Limited

SERVICES

- Data collection and review; coordination with local authorities
- Compilation of ortho-ready satellite images
- Economic development evaluation
- Traffic analysis and forecasting
- Conceptual design of alignment, bridges, tunnels and pavement
- Quantity and cost estimates
- Conceptual design report.

EXPANSION AND UPGRADE OF MAJOR LINK IN MOUNTANIOUS LANDSCAPE

Oman

The Bidbid-Sur Road is a major transportation link between the capital city of Muscat and the Sharqiyah region in Oman. The 260 km road traverses varied and challenging terrain from mountainous areas to alluvial planes. Oman's Ministry of Transport and Communications wanted to expand it from a single carriageway to a triple carriageway.

COWI carried out the preliminary study, created the design and supervised works on a 143 km section. The works included the construction of additional carriageways, four major wadi bridges, 14 grade-separated interchanges, several culverts, realignment of selected sections of road, and the construction of bypasses around two towns. COWI's Mapping unit also provided the aerial surveys using LiDAR to support the alignment studies.

FACTS

- Project name: Bidbid-Sur Road
- Project period: 2008-2013
- Client: Ministry of Transport and Communications, Oman

SERVICES

- Traffic planning and safety
- Aerial survey (LiDAR)
- Pre-design studies
- Preliminary design
- Detailed design
- Tender documents
- Construction supervision.

DESIGNING DOHA'S ORBITAL HIGHWAY

Doha

The orbital highway is part of the planned high-speed road around Doha, home to over 50 percent of Qatar's population and the country's economic centre. The primary aim of the 48 km, ten-lane motorway is to improve the transportation links for vehicular traffic in the southern part of Doha and improve access to the northern part of the city.

The design-and-build contractor chose COWI to develop and optimise the proposed design to meet local standards and safety requirements. We were also tasked with investigating suitable construction alternatives that could save time and money.

COWI's final design leaves open the possibility of future expansion to 14 lanes and the addition of footways and cycle paths in Qatar's fastest growing city.

FACTS

- Project name: Orbital Highway
- Project period: 2012-2013
- Client: Makyol

SERVICES

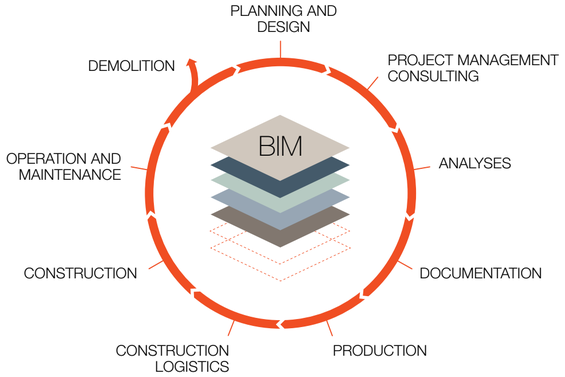
- Traffic analysis and planning
- Tender design of roads, bridges, interchanges, utility diversions and traffic management
- Street lighting and bridge underpass lighting
- Stormwater drainage system
- Treated sewage effluent network
- Protection and relocation of the water supply network
- Electrical and communication utilities
- Utilities protection works
- Landscaping, roadside beautification and irrigation works
- Bill of quantities and cost estimates.

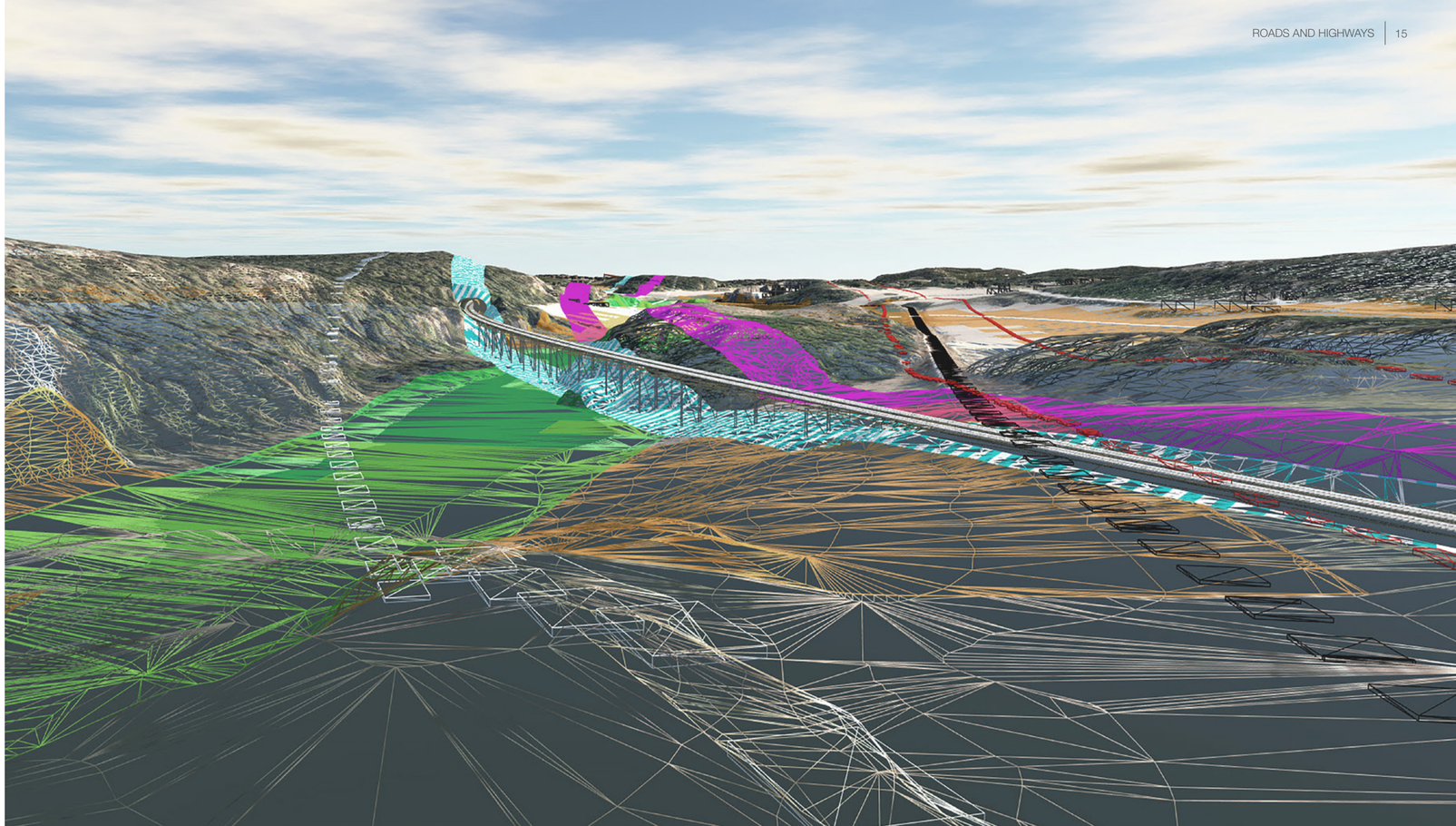
A DIGITAL APPROACH

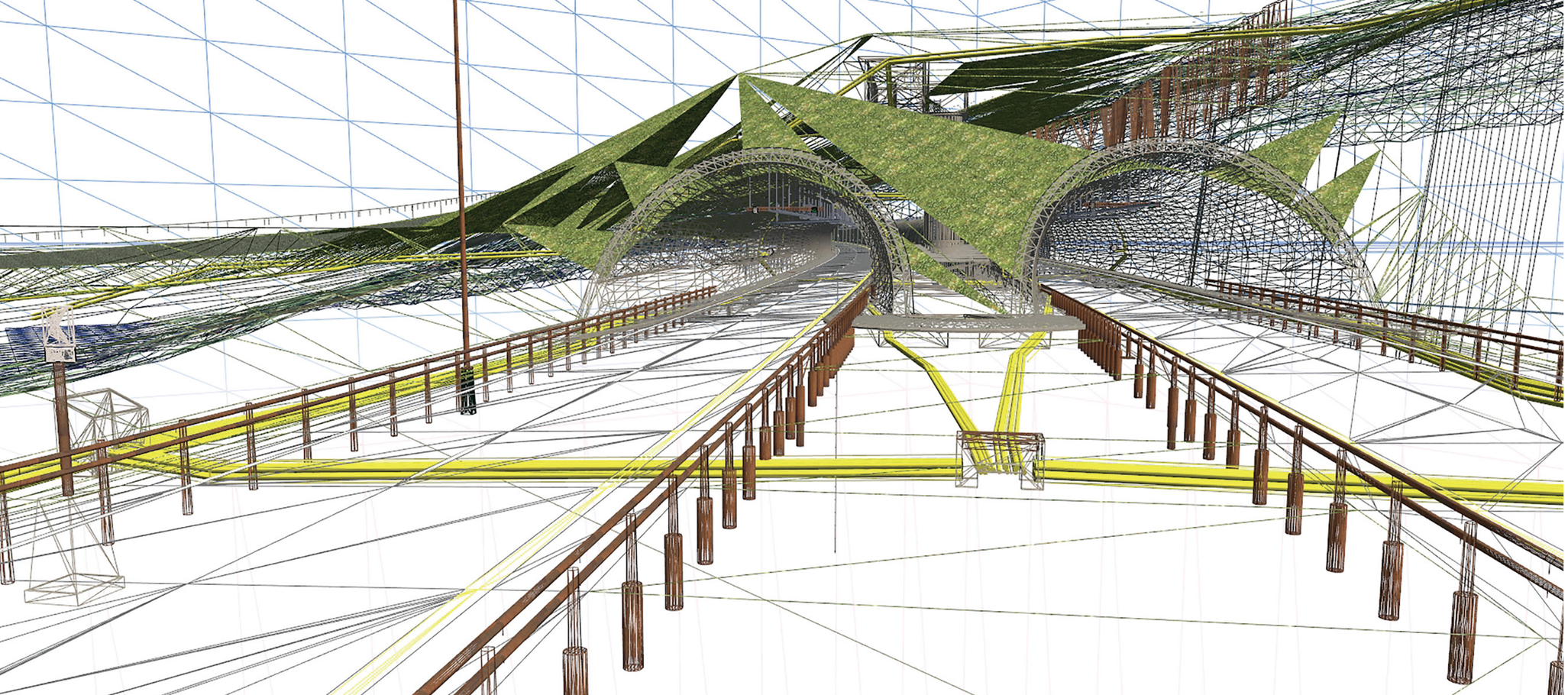
Roads and highway projects often involve many different stakeholders across technical disciplines as well as decision-makers and public authorities. To ensure integrated services and clear communication among all the parties involved, COWI uses 3D design from an early stage in the project process.

Adding BIM (building information modelling) to our toolbox, we combine multiple layers of project information into one coherent virtual model, which is accessible from any location. Thanks to BIM, we are able to detect possible clashes in the design phase, thus preventing discipline overlaps and construction delays.

On top of that, BIM enables you to practise effective asset management and maintenance.







PLANNING ONE OF NORWAY'S LARGEST ROAD AND RAIL PROJECTS

Norway

When Norway launched an ambitious road and rail construction project for one of the country's largest road networks, COWI was assigned as one of the project consultants.

COWI was responsible for section FP3, the largest individual contract on the project. This section involved the majority of the road construction works and presented many challenges with water and drainage due to its proximity to Lake Mjøsa.

Our team designed the 10 km four-lane E6 highway, two intersections, a 700 m long twin tubed tunnel, and two lay-bys. In addition, we planned 11 km of roads, a 5 km road for pedestrians and bicycles, and 5 km of new double tracks for the Dovrebanen railway.

The E6 highway became the largest construction site in Norway.

FACTS

- Project name: Fellesprosjektet E6/ Dovrebanen, FP3 (package including road and railway)
- Project period: 2010-2016
- Client: Norwegian Public Roads Administration and Jernbaneverket

SERVICES

- Roads
- Constructions
- Wastewater and drainage
- Lighting
- Landscape planning and architecture
- RAMS
- Environmental impact assessment (EIA)
- Acoustics, noise and vibration measurements
- Lighting design
- Health, safety and environment (HSE)
- Geotechnics
- Geological engineering
- Electromechanical engineering.

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ROAD WIDENING WITH MINIMAL DISRUPTION

Denmark

The M14 Elsinore Highway is a heavily congested commuter route linking Copenhagen to its northern suburbs and the major ferry port to Sweden. The transportation authorities decided to widen the most busy section of the highway from four to six lanes in order to mitigate the worst of the congestion.

The highway needed to be open to traffic throughout the project. This required coordinated efforts regarding land acquisition, traffic diversions, utility relocation and construction works. The combination of COWI's vast technical knowledge and strong understanding of local conditions, environmental aspects and the client's needs helped to minimise congestion during construction so that the project was completed on time and within budget.

The new, wider highway has been a success, improving traffic flow for more than 50,000 commuters, easing the traffic congestion on their daily work commute.

FACTS

- Project name: Elsinore Highway M14
- Project period: 2010-2016
- Client: Danish Road Directorate

SERVICES

- Preliminary design
- Detailed design
- Geotechnical and environmental studies
- Preparation of material for land acquisition and expropriation
- Aerial survey and photography
- Land records, environmental and noise studies
- Utility relocation planning
- Traffic diversion during construction
- Construction schedules and logistics
- Procurement assistance and follow-up.

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ONE OF DENMARK'S MOST COMPLEX ROAD EXPANSIONS

Denmark

The 21 km Motor Ring 3 is one of the main ring roads around Copenhagen, linking densely populated suburban areas. To ease the traffic flow and improve safety, this heavily congested commuter route was widened from four to six lanes.

COWI was responsible for the master planning, detailed design, relocation of utilities and traffic management. The project was divided into four sections, where COWI prepared tender documents for each contract package and assisted the client in the tender process.

A main requirement of the project was to keep the ring road fully operational during the expansion works. This involved extensive planning of road diversions, construction logistics and user information systems (ITS), as well as temporary road marking and signalling.

The number of junctions on the ring road made it one of the most complex highway network extension projects ever undertaken in Denmark.

FACTS

- Project name: Motor Ring 3
- Project period: 2003-2013
- Client: Danish Road Directorate

SERVICES

- Geotechnical studies and environmental studies
- Land acquisition
- Detailed design of road section and grade-separated interchanges
- Pedestrian bridges and underpasses
- Retaining walls, noise barriers and screens
- Road lighting, signalling and road marking
- Utility relocation and traffic management
- Preparing tender documents for four contract packages Construction supervision and follow-up.

DIFFERENT PHASES DIFFERENT SERVICES

As a multidisciplinary company, COWI provides the knowledge and competencies you need for achieving a complete and efficient infrastructure solution. Regardless of the project size and phase, you can count on our high-quality services to obtain a sustainable solution.

FEASIBILITY STUDY
- Assessment of existing road conditions
- Traffic analysis and forecasts
- Economic and financial evaluation
- Pavement surveys
- Traffic forecasts.

DESIGN PHASE I – CONCEPTUAL DESIGN
- Alignment studies
- Data collection
- Stakeholder involvement.

DESIGN PHASE II – PRELIMINARY AND TENDER DESIGN

Preliminary design:
- Quantity and cost estimation
- Hydrological assessment
- Catchment areas.

Tender design:
- Design optimisation
- Quantity estimation
- Topographic survey
- Design optimisation.

DESIGN PHASE III – DETAILED DESIGN
- Design optimisation
- Detailed design
- Procurement strategy
- Cost estimation
- Tender evaluation.

TENDERING
- Procurement and tendering
- Procurement strategy
- Prequalifications
- Specifications
- Functional requirements
- Bill of quantities
- Construction costs estimation
- Tender evaluation
- Award of contracts assistance.

SUPERVISION
- Supervision
- Project management
- Design review
- Claims management
- Design optimisation.

ASSISTANCE
- Technical assistance
- Training
- Pavement management systems
- Asphalt recycling
- Pavement design alternatives
- Reuse of materials
- Design verifications.

MAINTENANCE
- Construction follow-up
- Survey and monitoring
- Traffic information systems (ITS)
- Maintenance of road paving.

REHABILITATION OF TANZAM HIGHWAY

Tanzania

Opened in the early 1970s, the 921 km Tanzam Highway is the most important trunk road in the Tanzanian road network and was in need of a major overhaul. It is a critical international transportation route linking the port of Dar es Salaam to the landlocked countries of Zambia, Malawi and the Democratic Republic of Congo.

The project involved constructing 220 km of road, one major bridge and 12 medium-sized bridges. COWI was responsible for strengthening and resurfacing the road, paving hard shoulders and making traffic safety improvements on five sections of the highway.

FACTS

- Project name: Tanzam Highway
- Project period: 2005-2016
- Client: Tanzania National Roads Agency (TanRoads)

SERVICES

- Design review
- Detailed engineering design
- Environmental and social impact assessment
- Consultancy during tender process
- Construction supervision
- Monitoring of defects during liability period.

REDEVELOPING THE NORTHERN CORRIDOR ROUTE

Uganda

At 650 km long, the Northern Corridor Route is Uganda's most important road link. Running from the Kenyan border via Kampala on to the Rwandan border, it is a vital infrastructure artery. The Northern Corridor redevelopment will support both economic and social development in the region, while providing an efficient district road network in Uganda.

COWI was responsible for the feasibility studies, detailed design and supervision on the construction works. The project involved widening the existing 160 km of road and building a 14 km bypass road north of Mbarara. COWI also managed the bridgework, constructing an 80 m long, 22 m wide composite bridge across the Ruizii River and rehabilitating six smaller bridges.

FACTS

- Project name: Reconstruction of the Northern Corridor Route
- Project period: 2008-2017
- Client: Uganda National Road Authority (UNRA)

SERVICES

- Field investigations and topographical survey
- Economic assessment, sociological and environmental impact assessments
- Detailed design
- Preparation of tender documents and tender assistance
- Construction supervision.

FUTURE-PROOFING TRANSPORTATION IN CENTRE OF NAIROBI

Kenya

The Likoni Road Junction to James Gichuru Road Junction is a vital stretch of the A8, which runs through Nairobi. This 12 km section required a major upgrade through grade separation to mitigate heavy congestion and improve the travel experience for motorists and pedestrians.

The project involved a highway upgrade, a 1.5 km viaduct, 5 interchanges, 11 pedestrian bridges, 16 overpasses, 1 underpass, and 4 km of retaining wall. We carried out the feasibility study and preliminary design with a focus on sustainability factors.

COWI implemented a bus rapid transit system (BRT) to the scope that created more space for non-motorised traffic and added aesthetic value to the traffic system.

FACTS

› Project name:	Upgrading the A8 from Likoni Road James Gichuru Road, Nairobi, Kenya
› Project period:	2012-2015
› Client:	Kenya National Highways Authority (KeNHA)
› Partner:	Otieno Odongo and Partners/QUTEP Ltd

SERVICES

- Feasibility study
- Preliminary engineering design
- Environmental and social impact assessment
- Traffic analysis using VISSIM and SIDRA.

SCALABLE TEAM OF SPECIALISTS

Wherever you are in the process, you will always have access to an agile team of experts, dedicated to finding outstanding technical solutions and managing stakeholders' interests.

We carefully select our teams to match their specialist competencies with your specific project requirements, changing them as necessary and scaling our efforts to meet peak demands as well as daily operational needs.

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PROACTIVE PARTNERSHIP
Your principal contact person will be our project director, who will be responsible for the overall project and the link between you and the project team. The project director will be on hand to address any issues during the design and approval process and to supervise construction work, whether on site or in the design centre.

A SMART DESIGN PROCESS
Our highway design engineers work in close collaboration with you during the design process, contributing cost optimisations and design alternatives that ensure you get the best quality and cost efficiency from your project goals. COWI's design engineers will also develop cost estimates and facilitate design follow-up with you.

SUSTAINABLE PAVEMENT ENGINEERING
We aim to maximise both the durability and cost effectiveness of your pavement solutions. Our specialist pavement engineers work closely with our geotechnical and alignment engineers to create sustainable and efficient designs that benefit you as a client as well as society.

YOUR LEGAL PARTNER
Our legal specialists are available, on request, to assist with contractual issues covering procurement, contract negotiations, tendering, tender evaluations and claims management.

SECURING THE BEST QUALITY
Our internal quality managers will prepare and implement a project quality plan for you, which they are responsible for throughout the design and supervision process. With its ISO certification, COWI has the in-house expertise to develop high-quality reports, drawings, tender documents and manage the processes behind the phases.

SMOOTH OPERATIONS
During the construction stage, our resident engineers will be your proactive partners. They will work with you to achieve the best project results on time and within budget, using a carefully managed and documented construction process. They are responsible for all site activities, including supervision, staffing, reporting, claims management, change management, project economy and follow-up.

OPTIMISING TRANSPORTATION SOLUTIONS
Our specialist transportation economists and planners provide you with vital data to build cost-effective and efficient transportation solutions. Understanding current and future traffic requirements and transportation economics enables you to make the best possible decisions for your project. We undertake traffic analysis and forecasting, financial evaluation, sensitivity and risk analysis, and reporting.

YOUR TECHNICAL ADVISOR
Our technical advisors assist you with your project preparation and implementation needs. They are on hand to advise on the coordination and management of road rehabilitation and maintenance projects, associated training activities, related audits and maintenance projects for donors.

FROM GRAVEL TO ASPHALT

Uganda

The Mbarara-Kikagati-Murongo Bridge Road connecting Uganda to neighbouring countries Tanzania and Rwanda was but a gravel road. Therefore, it was decided to upgrade the bridge road to a class II asphalt road, to improve the road quality and traffic flow between the countries.

The new 67 km bridge road, including the 7 km Isingiro Mabona loop, runs through Mbarara and the Isingiro district all the way to the Tanzanian border at Murongo Bridge, and across the Kagera River.

COWI worked in close collaboration with the contractor on fieldwork, studies and design. Thanks to the success of our joint efforts, the final design and implementation phases were completed in time and on budget.

FACTS

› Project name:	Design & Build Contract, Mbarara-Kikagati-Murongo Bridge Road, Uganda
› Project period:	2011-2014 (design and construction period)
› Client:	China Communications Construction Company Ltd (CCCC)
› Owner:	Uganda National Roads Authority (UNRA)

SERVICES

- Fieldwork, studies and design
- Feasibility study
- Preliminary design
- Detailed design.

BYPASSING TRAFFIC IN KAMPALA

Uganda

Traffic has been a major problem in Kampala, the fastest growing city in Africa. The addition of a dual carriageway to the Kampala Northern Bypass Road was proposed to improve traffic flow from the east to the west and ease congestion in and around the city centre.

COWI's services included design review and construction supervision over the entire three-year construction period. Using state-of-the-art traffic simulation software, we provided vital input to the design review and an evaluation of the capacity of the grade-separated intersections. In addition, COWI was responsible for the construction of flyovers and roundabouts for the bypass road.

FACTS

- Project name: Supervision of Works under the Capacity Improvement of the Kampala Northern Bypass Project, Uganda
- Project period: 2014-2017
- Client: Uganda National Roads Agency (UNRA)
- Partner: PEC Ltd
- Funding: European Union, 10th EDF

SERVICES

- Review of tender design
- Review of works contract cost estimates
- Design update
- Construction supervision.

DESIGNING ROADS TO SAVE LIVES

Sweden

ASTAZero is the world's first full-scale test facility for future road safety. It was set up in response to the Swedish Parliament's vision of zero deaths and serious injuries from road accidents.

The state-of-the-art facility recreates different traffic environments to test advanced safety systems and see how they perform in a range of scenarios. COWI was responsible for the detailed design, tender documents and construction supervision of the test area, and improvements of the original layout plans created cost savings.

ASTAZero serves as an important international research and development centre for the testing and certification of future road safety systems. Sweden has opened up the facility to other countries and vehicle manufacturers to help them improve road safety.

FACTS

- Project name: ASTAZero – Active Safety Test Area
- Project period: 2011-2013
- Client: ASTAZero AB

SERVICES

- Basic design
- Detailed design
- Tender documents
- Construction supervision.

EXPANDING WESTERN SWEDEN'S ROAD AND RAIL

Sweden

The expansion of BanaVäg i Väst is one of Sweden's largest infrastructure projects. The project involved converting the E45 motorway in western Sweden into a four-lane motorway and the Norway/Vänern railway line into a double-track line, with the two sharing a narrow corridor. The huge expansion contributes to regional growth by improving commuting and goods transportation.

COWI headed the detailed design of a large section of the new motorway expansion featuring intersections in two levels and of the new double-track railway, which was constructed at the same time. COWI was responsible for all of the project's technical infrastructure elements. In particular, COWI experts addressed complex geotechnical challenges on the road-rail corridor while COWI's environmental specialists assisted in the clean-up of a contaminated field.

The project was the first road and rail expansion project in Sweden to be managed by a single organisation.

FACTS

- Project name: BanaVäg i Väst
- Project period: 2008-2012
- Client: The Swedish Transport Administration

SERVICES

- Detailed design
- Tender documents
- Supervision.

© Aarhus Light Rail I/S

A NEW ERA OF LIGHT RAIL

Denmark

The three largest cities in Denmark are implementing light rail systems to strengthen the network of transportation links in their cities, reduce congestion and offer modern, sustainable commuter options.

COWI has played a central role in these ground-breaking projects, from feasibility studies through to detailed design. COWI has handled the project management on the light rail projects in Aarhus and Odense, and been involved in varying phases across the three light rail projects, including traffic planning and civil works.

As the Aarhus Light Rail is the first light rail system in Denmark, a set of new road standards and supplementary regulations on the establishment and operation of the light rail were required. COWI was instrumental in proposing and developing these.

FACTS

› Project name:	Aarhus Light Rail, Odense Tramway, Greater Copenhagen Light Rail
› Project period:	2000-2017, 2011-2020, 2014-2020
› Clients:	The City of Aarhus/Aarhus Letbane I/S, Odense Municipality/Odense Letbane P/S, Ring 3 Letbane I/S
› Partner:	SYSTRA (Aarhus, Odense) SYSTRA and ETC.

SERVICES

- Project management
- Feasibility studies
- Environmental impact assessment (EIA)
- Design
- Tender and contracting
- Construction and trail running.

MADE BY COWI

SINDH ROAD SECTOR DEVELOPMENT, PAKISTAN

Major road development in the Sindh Province, comprising a sector reform component and an investment component.

FACTS

- Project period: 2004-2009
- Client: Provincial Government of Sindh
- Partners: Finroads, Finland and Louis Berger Group, USA ECIL, Osmani @ Co. REC, ACC and ABM

SERVICES

- Project management
- Feasibility studies surveys and investigations
- Design review and detailed design
- Tendering and contracting
- Site supervision and construction management
- Full environmental and resettlement management guidelines for desert roads design and construction.

NEW STATION AREAS FOR THE COPENHAGEN METRO, DENMARK

Design of 17 new metro station areas. The new Enghave Plads Station is a classic city square with fountain, landscape foliages and bench design.

FACTS

- Project period: 2009-2018
- Client: Metroselskabet I/S
- Partner: Ove Arup & Partners Ltd and SYSTRA SA – joint venture partners

SERVICES

- Preliminary design
- Detailed design
- Communication strategy
- Landscaping.

WIDENING OF BRANDE BYPASS ROAD, DENMARK

Widening of a 6.2 km motorway section from two to four lanes, upgrade to diamond of all interchanges and construction of noise screens.

FACTS

- Project period: 2010-2014
- Client: Danish Road Directorate
- Partner: Orbicon

SERVICES

- Project management
- Design of roads and bridges
- Environment, area rights and expropriation
- Preparation of all expropriation material
- Construction supervision.

BEIRA-MACHIPANDA ROAD, MOZAMBIQUE

Updating the feasibility study for the 286 km road and 900 m heavy-vehicle access road to the port of Beira. Features included 35 bridges, 28 major culverts, 305 minor culverts, 278.6 km of single carriageway and 7 km of dual carriageway.

FACTS

- Project period: 2011-2012
- Client: Austral-COWI, Lda.
- Funding: China Communication Construction Company Ltd. (CCCC)

SERVICES

- Detailed field reconnaissance
- Execution of axle load surveys
- Update of traffic growth scenarios
- Update of construction cost, road deterioration and maintenance
- Feasibility study for full reconstruction of pavement
- Alignment improvement.

KAMPALA-ENTEBBE EXPRESSWAY, UGANDA

Design and construction of a new 38 km toll expressway to dual carriageway standard and 13 km of spur road. The project included three major bridges.

FACTS

- Project period: 2012-2013
- Client: China Communication Construction Company Ltd. (CCCC)

SERVICES

- Design review
- Assistance to the client's design team.

NACALA ROAD CORRIDOR PHASE II, ZAMBIA

Providing institutional support and capacity-building component services. This included 160 km of roads in Zambia, Malawi and Mozambique supporting economic growth in the Southern African Development Community.

FACTS

- Project period: 2012-2015
- Client: Road Development Agency, Republic of Zambia

SERVICES

- Support of bidding process incl. design and bidding document review and packaging
- Design of project performance monitoring system
- Capacity building and contract management during the construction phase.

MADE BY COWI

CITY STREET RENEWAL, OSLO, NORWAY

Oslo's city street renewal project focused on three roads: Olav 5th Street, Haakon 7th Street and Klingenberg Street. Its objective was to improve the pedestrian paths and the flow of traffic and pedestrians between the city centre and the waterfront.

FACTS

- Project period: 2011-2014
- Client: The Municipality of Oslo – Agency for Urban Development

SERVICES

- Landscape architecture
- Roads
- Constructions
- Water and drainage
- Environmental consultancy
- Health, safety and environment (HSE).
- Electronical engineering
- Street heating.

CONCEPTUAL DESIGN, PACKAGE 21, QATAR

Package 21 was a road improvement project in central Doha, Qatar. COWI provided three conceptual design options for 20 km of existing road. It included 21 existing intersections, 11 potential grade-separated interchanges, 2 tunnels and a comprehensive streetscape and landscape component.

FACTS

- Project period: 2011-2012
- Client: Ministry of Municipality and Urban Planning
- Partner: Q-Serve

SERVICES

- Studies and surveys
- Transportation planning
- Conceptual design of roads, bridges, interchanges, utility diversions and traffic management
- EIA and traffic impact assessment
- Wet and dry utility design.

RED VIAL 5 HIGHWAY, PERU

The Red Vial 5 project was part of a highway development plan designed to attract private investments in Peru's road infrastructure. The project involved a technical audit update of a 183 km toll road section of the Pan-American Coastal Highway leading from Lima towards the north of Peru.

FACTS

- Project period: 2004-2009
- Client: Inter-American Development Bank (IDB)
- Partner: SINTEF

SERVICES

- Consultancy
- Expert assistance
- Operation
- Maintenance.

IRINGA MUNICIPAL BYPASS ROAD, TANZANIA

The Iringa Municipal Bypass Road runs through mountainous terrain, linking the Dodoma-Iringa road with the Tanzam Highway, bypassing the town of Iringa. COWI led the feasibility study, detailed design and preparation of tender documents for constructing the 10 km of access road.

FACTS

- Project period: May-August 2013
- Client: Tanzania National Roads Agency (TANROADS)
- Partner: COWI Tanzania Ltd.

SERVICES

- Topographical survey
- Traffic counts
- Soil and materials investigations
- Detailed design
- Alignment in difficult terrain
- Drainage design
- Pavement design
- Design of ancillary works
- Roads and structures.

ROAD SECTOR PROGRAMME SUPPORT II, ZAMBIA

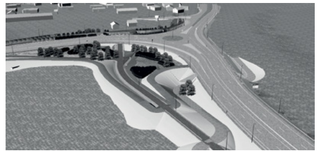
COWI provided technical assistance support to the District-Based Feeder Road rehabilitation programme. This included the support and monitoring of highway rehabilitation for 13 districts and the supervision of periodic maintenance works on the Mongu-Kagma-Tateyoyo Gate Road, the Chembe-Mansa-Kashikishi Road and the Mumbwa weigh bridge.

FACTS

- Project period: 2011-2013
- Client: Royal Danish Embassy, Lusaka/Danida

SERVICES

- Quality assurance
- Supervision monitoring
- Technical consultancy
- Support to the district councils
- Training programmes
- Assistance to the local road authorities
- Assistance with progress reports.



RV22 ISAKVEIEN – GARDERVEIEN, NORWAY

A 5.1 km section of the road was resurfaced, of which 4.3 km was expanded from two to four lanes to reduce congestion. The road, which is used by more than 22,000 vehicles a day, was kept operational during the entire construction phase. Considerable attention was given to environmental concerns in order to preserve as much of the surrounding area.

FACTS

- Project period: 2011-2015
- Client: Statens Vegvesen Region Øst

SERVICES

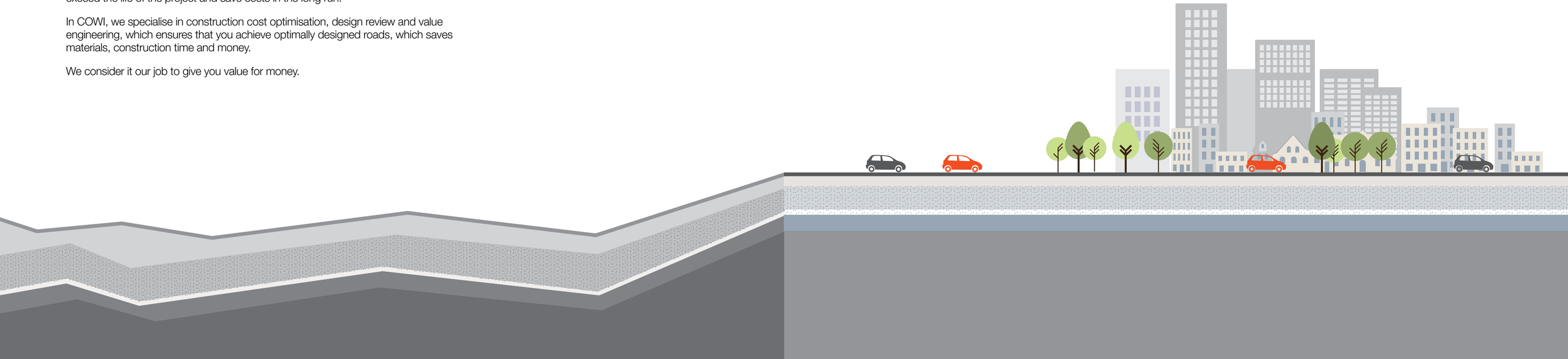
- Roads
- Constructions
- Wastewater and drainage
- Landscape planning and architecture
- EIA and HSE
- Acoustics, noise and vibration measurements
- Geotechnical and geological engineering
- Electromechanical engineering and lighting.

SPEND SMARTER

Good consultancy builds on technical know-how, experience and an understanding of yours and your stakeholders' needs. From time to time, good consultancy is, unfortunately, seen as more of an expense than the investment it is. However, proper consultancy can exceed the life of the project and save costs in the long run.

In COWI, we specialise in construction cost optimisation, design review and value engineering, which ensures that you achieve optimally designed roads, which saves materials, construction time and money.

We consider it our job to give you value for money.



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POWERING YOUR 360° SOLUTIONS
COWI is a leading consulting group that creates value for customers, people and society through our 360° approach.
We tackle challenges from many vantage points to create coherent solutions for our customers.

Cover photo: Nicky Bonne