

# People, planet, prosperity

Environmental and social  
advice for sustainable project  
and business performance





# More than doing what's right

Advancing environmental and social agendas contributes to successful project development and better commercial results. Here's how:

## Not just mitigation, but enhancement

Lenders and investors have for some years expected projects not just to do least harm, but to manage risks and compensate for any damage to ecosystems and/or local communities. The financial sector has set out its environmental performance requirements in the Equator Principles, and projects must comply to qualify for funding. But share- and pension-holders have an increasingly sharp eye on ethics. Projects that enhance the environment and improve conditions for affected people are more likely to attract investment, and secure it on more favourable terms.

## Setting the right expectations

What's desirable versus what's affordable. It's a conundrum as old as infrastructure itself. But today it's expected that infrastructure will respect and reflect a site's natural, aesthetic and heritage stature, or its community value: desirability versus affordability is a hotter topic than ever before. It's a balancing act that requires:

- local knowledge and contextual sensitivity
- a firm grasp on the economic and technical dimensions of infrastructure
- the ability to connect and communicate strongly with local communities – people who will live with and use the infrastructure long term

Effective engagement helps to target the issues of greatest local importance – and they could be 'must-have' needs or conditions that degrade people's lives.



Connecting with communities enables the most to be made of available capital. And it helps constraints to be explained, mitigating disappointment and opposition.

## Measuring the intangible benefits

Say 'environment', think 'people'. Whether we're talking about water abstraction, the emission of gaseous exhaust, building new transport infrastructure or changing land use, there will always be 'sensitive receptors'. Those receptors will not always be people – they may be species, habitats or natural systems. But, directly or indirectly, it is people who react to impacts.

Negative impacts are increasingly costed into projects. But what of potential positive impacts?

By looking for the opportunities early enough in project development, it's possible to go beyond mitigation to deliver benefits at little or no additional cost. What is the value of better access to water, reduced risk of respiratory illness, improved access to commerce, education and health, or of a landscape enhanced?

Our Transparent Economic Assessment Model (TEAM) is a tool for measuring the local economic impacts of infrastructure projects, business activities, and social and environmental services. Standard modelling tools evaluate benefits in proportion to cost at a regional or national scale. But TEAM operates at a local level, identifying ways in which a scheme will make life better for specific communities.



## Reducing risk, improving certainty

Neglect planning and permitting at your peril. Fail to address the concerns of local residents and stakeholders, adequately consider the impacts of construction, or overlook a process, and your project can fail to gain approval.

Yet despite the risks, an astonishing number of projects don't manage them effectively and get stuck, with contractors' costs racking up and payback for investors being delayed while redesigns are carried out or statutory hurdles are cleared.

Conflict with communities and delays that impact on commercial performance can do significant reputational damage to the project and its backers. But paying close attention to the detail can accelerate progress through planning, and enhance reputation and brand.

## Standing by promises, safeguarding self-interest

At the very least to uphold reputation, and at best to gain business benefits, it's important that environmental and social measures put in place are followed through and maintained over the life of the project. Businesses are in relationships with the communities they recruit from, those who supply the services they rely on, and those who they sell goods or services to. Effective environmental and social management is about creating, preserving and enhancing those relationships, upon which commercial continuity and success depend.

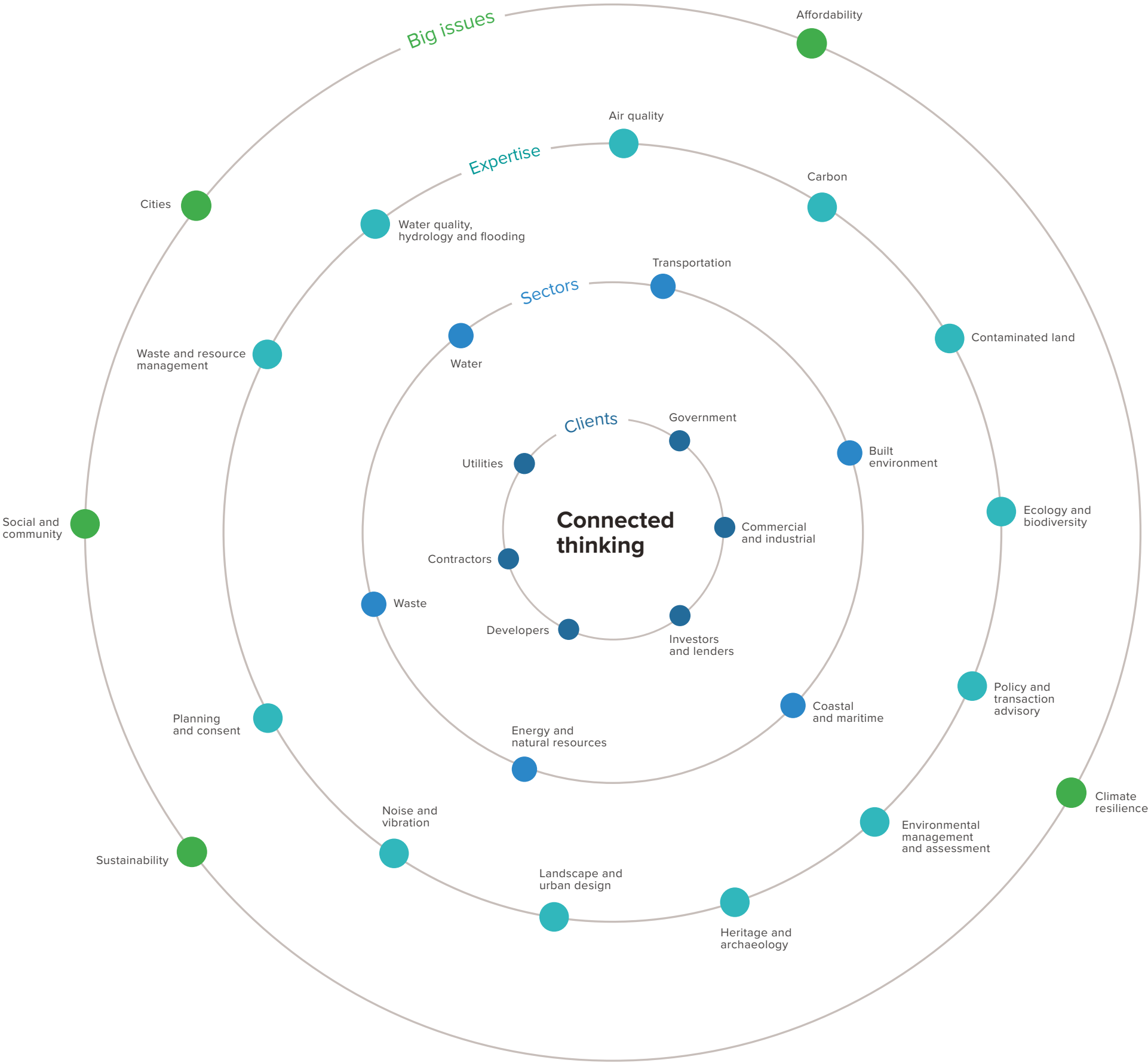
# Realistic idealism – centred around you

Why do we try to get the best for  
environments and communities?  
Because we care.

We care about making projects the best they can be. We believe that business needs can be met without compromising the environments and communities in which they're set. We want to hand on a world that is richly diverse, productive and liveable to tomorrow's generation, and the generations that come after that. We're optimists and idealists.

And we're practical people who thrive on solving problems and coming up with better ways of doing things.

Whatever your objectives, needs, constraints and opportunities, we'll mobilise the right combination of skills and experience for your project.







# Rebuilding beach revitalises bay

**Project**  
Colwyn Bay Waterfront

**Location**  
UK

**Client**  
Conwy County Borough Council

**Expertise**  
Environmental impact assessment, ecological surveys and landscape assessment

**Opportunity**  
Back in the days when the seaside ‘staycation’ was how the British spent their holidays, Colwyn Bay in north Wales had a beautiful sandy beach. The fortunes of Britain’s seaside towns have changed dramatically over the last 40 years, as did the condition of Colwyn Bay beach. Prevailing tidal conditions swept away the sand to leave patches of bare clay. During a single severe storm, the beach level could drop by as much as a metre. Storms also regularly undermined the town’s sea walls, meaning the main promenade road was often closed during bad weather. The town badly needed an effective defence against high tides and storms, as well as a catalyst to revitalise tourism.

**Solution**  
Building on the concept of using a replenished beach as a form of defence, we assessed potential impacts on coastal processes and found that a sustainable solution could be provided by considering the amenity benefit the beach would create in comparison with other options. Marine species would benefit from new habitat created by a rock groyne built to control sand migration. Raised beach levels would reduce wave action on the defences, minimising overtopping and flooding of the promenade, and creating new development opportunities. By engaging with the community and local businesses, we gained confidence that the project would kick-start regeneration.

**Outcome**  
Its new sea wall provides Colwyn Bay with a hard line of defence and has also given the town a new promenade and the site for a water sports centre and restaurant. The beach now buffers against winter storms while acting as a magnet for summer tourists. Rather than an ugly rock barrier, the community and visitors have an attractive beachfront which has injected new economic life and stimulated ambition for a sustainable future for the town. The project received a Whole Team Excellent Award under the UK’s CEEQUAL scheme, which recognises outstanding sustainability performance.

# Unmuddied waters

**Project**  
Hong Kong International Airport (HKIA) expansion

**Location**  
Hong Kong

**Client**  
Airport Authority Hong Kong (AAHK)

**Expertise**  
Environmental impact assessment (EIA)

**Opportunity**  
HKIA is often named one of the world’s best airports by travellers and the aviation industry, and it’s vital to the city’s ongoing success as an economic powerhouse. The HKIA Master Plan 2030 revealed the two-runway airport would soon reach saturation point and deemed a third runway with related facilities essential, to be built on land reclaimed from the sea. The scheme prompted calls from local green groups and residents to mitigate potential effects on marine wildlife and noise impacts. About 40% of the area earmarked for the extension was previously a disposal site for contaminated mud, which also raised concerns about dredging. We carried out the EIA and provided options that would allow the best balance to be struck between environmental protection, technical feasibility, cost and operational performance.

**Solution**  
Our EIA work benefited from the fact that we were also producing scheme design for the three-runway system. This enabled these two elements of our work to be carried out hand in hand and saw environmental mitigation built in from the early design stage. This included minimising the land reclamation footprint, enhancing the eco-friendliness of seawalls and using non-dredge ground improvement to stabilise the sea bed. Strong engagement with multiple stakeholders kept them updated on EIA progress and proposals. Public forums and media briefings were set up when the EIA was published to clearly explain its findings and mitigation measures.

**Outcome**  
The extension to HKIA’s man-made island will be reduced by more than 20%, from 827ha to 650ha. Micro habitats will be built into the seawall to stimulate species diversity. Using non-dredge ground improvement methods will prevent contamination of the seawater. Flights will approach and depart the airport over water whenever practicable to minimise noise impacts. A Marine Ecology Enhancement Fund and a Fisheries Enhancement Fund, proposed in our EIA, have been established to provide funding for research into further improvement of local waters. Hong Kong’s Environmental Protection Department approved our EIA and granted the Environmental Permit to AAHK in November 2014. Reclamation work for the three-runway system started in August 2016.







# New route to growth

**Opportunity**  
The proposed Crossrail 2 would link rail networks in Surrey and Hertfordshire via a new tunnel beneath London and several new stations. It would relieve congestion on busy routes into central London and support economic development in and around the capital. Environmental Statements for ‘mega projects’ of this type typically involve a huge amount of input, cost a lot of money and result in large amounts of documentation. TfL is adopting a more proportionate approach that seeks to focus on the ‘must-know’ information and present it in more innovative ways that are easy to use for a large, non-expert audience.

**Solution**  
We’re helping TfL to develop this proportionate approach, focusing on the issues and areas where key effects are likely rather than applying a single blanket approach across the project. This should result in more tailored and specific assessments, reduced survey and evaluation work, and more concise, digestible documents, and so drive far more cost-efficient environmental impact assessment and Environmental Statement production.

**Outcome**  
‘Proportional assessment’ is a hot topic across the environment sector, and our work on Crossrail 2 is the first time this approach has been driven on a UK mega project. Initial results have been very well received by the Department for Transport and government agencies, such as the Environment Agency and Historic England. They have supported our focus on important issues and recognise that issues of less significance – based on our extensive previous experience – can be set aside. The result should be clearer, more-logical documentation that is accessible to all end users and considerably less expensive to produce.

**Project**  
Crossrail 2

**Location**  
UK

**Client**  
Transport for London (TfL)

**Expertise**  
Environmental appraisal, feasibility studies and designs, and sustainability strategy





# Securing investment to safeguard health



**Project**  
Turkish Hospitals PPP programme

**Location**  
Turkey

**Client**  
Multiple EPC contractors and commercial banks

**Expertise**  
Lenders' environmental and social advisor

**Opportunity**  
Turkey's Ministry of Health needs more than 95,000 new hospital beds before 2023 to meet growing healthcare demands. Private investment totalling US\$14b was needed, so the government launched the world's biggest PPP programme to meet this ambitious target. Several international financial institutions (IFIs) were approached to provide funding. Investors demand international best practice, and the Ministry of Health adopted processes successfully used by the UK National Health Service. However, they were amended to meet local conditions and the project finance contracts that tenders were based on contained risk allocations that IFIs did not consider 'bankable'.

**Solution**  
We were appointed to provide due diligence services that would reassure the many lenders involved. We brought together a team with expertise in international healthcare PPPs and experience in the Turkish health sector. We assessed the environmental and social management capabilities and experience of stakeholders. This involved reviewing environmental impact assessments and – where we felt these did not meet lenders' standards – insisting on additional work to assure that land permitting, noise, air quality, worker wellbeing and other standards would be met during construction and operation.

**Outcome**  
This programme will have a fundamental impact on healthcare provision for the entire Turkish population. As the sole international technical advisor and only advisory consultancy providing due diligence, we're helping to secure the vast investment needed. Financial close has either been completed or is imminent for several projects, and construction has started on others. We're also providing construction monitoring to assure lenders that projects are meeting the requirements of their EIAs. This includes the Bilkent Integrated Health Campus in Ankara, which – with nine hospitals, 3804 beds, 125 operating theatres and 9000 staff – will be the world's largest greenfield healthcare scheme.

# Protecting the environment, powering the economy

**Opportunity**  
The Salobo mining complex is the site of Brazil's largest copper deposit and mining giant Vale was keen to unlock its potential. Brazil's tough environmental and social legislation is designed to protect biodiversity, local communities, indigenous people and cultural heritage. Vale was struggling to obtain the last part of an environmental license without which the project could not proceed. A lack of data about the remote site in the middle of the Amazon forest made assessing the impact of mining difficult. Land- and water-based fauna studies had to be undertaken to get the programme back on track.

**Solution**  
We mobilised 70 specialist researchers from universities around Brazil. Their extensive knowledge of Amazon ecology and expertise in wildlife sampling reinforced the work of our team in a previously unexplored area of Brazil. We built up a detailed understanding of the area's wildlife, its habitats and migratory movements. Using this

benchmark of 'normal conditions', we monitored the environment over two years while the mine was built, assessing all impacts on fauna and using our insight to propose mitigation measures.

**Outcome**  
Our first report was submitted to Brazil's environment agency less than six months after we were engaged. Not only did our work result in the government releasing the environmental license to Vale, they also commented that it was the most effective assessment yet submitted. After a year of work, it was clear to us that the scope of fauna monitoring was unnecessarily extensive. We recommended it be reduced and refocused, which the environment agency accepted. When the monitoring programme was completed, an operating license for the mine was granted. Our work at Salobo continues through projects in environmental education, endangered species monitoring and preparation of technical books discussing the results of fauna monitoring.

**Project**  
Salobo copper mine

**Location**  
Brazil

**Client**  
Vale

**Expertise**  
Environmental studies, reporting, monitoring and education





# Bear necessities

**Opportunity**

When Midla set out to construct an 84km natural gas pipeline it found 55km of mature hardwood-forested wetlands, cypress swamps and bayous in its path. Significant portions of the right of way were federally protected habitat for the threatened Louisiana black bear. Traditional construction techniques would have been difficult to permit. And compensatory mitigation would have been prohibitively expensive or even impossible to obtain on the scale needed.

**Solution**

We worked with our client, landowners and the Federal Energy Regulatory Commission, U.S. Fish & Wildlife Service, U.S. Army Corps of Engineers and several state agencies to look afresh at construction methods, sensitive resource impacts, compensatory mitigation and costs. This delivered a cost-effective solution that could be permitted by the regulatory agencies. The route underwent minor realignments, with additional horizontal directional drilling to avoid impacts to protected species habitat, wetlands and water bodies.

**Outcome**

The pipeline was successfully permitted and constructed. We worked with Midla and its contractor during construction to avoid impacts to sensitive species during denning season when young were being reared. Our environmental monitoring and reporting enabled Midla to build through seasonal wetlands during dry periods, avoiding the cost and impacts of using load-bearing construction mats for heavy equipment. Where use of mats was unavoidable, close coordination with regulatory agencies allowed for more-efficient construction methods. This provided substantial savings. Midla also realised compensatory mitigation savings as impacts to 30ha of protected habitat were avoided.

**Project**  
Natchez pipeline

**Location**  
USA

**Client**  
American Midstream (Midla)

**Expertise**  
Environmental assessment, surveys and monitoring, regulatory permitting, agency consultation and compensatory mitigation





# Nothing to spoil the bigger picture



**Project**  
North-South Corridor (Torrens Road to River Torrens) Project

**Location**  
Australia

**Client**  
Department of Planning, Transport and Infrastructure

**Expertise**  
Site contamination management and sustainability assessment

**Opportunity**  
The North-South Corridor (Torrens Road to River Torrens) Project will deliver a 4km non-stop section of roadway, providing significant travel time saving for Adelaide’s commuters and freight transporters. A 3km section of lowered non-stop motorway will provide three lanes in each direction, at up to 8m below the existing surface of South Road. Due to the lowered nature of the motorway, the project will require removal of around 400,000m<sup>3</sup> of spoil. This includes land affected by former road, rail, residential, commercial and industrial uses. As part of the T2T Alliance, Mott MacDonald identified the contamination status of previously unclassified spoil material and identified onsite reuse or recycling options for contaminated soil. This included determining how to maximise reuse of spoil onsite and minimise what was sent to landfill.

**Solution**  
Baseline and waste-classification soil assessments undertaken across the site during planning by our client identified various soil contamination profiles. We carried out additional studies and onsite investigations to further define potential risks and identify suitable management options. Our multicriteria analysis of reuse and disposal options identified sustainable solutions, and our strategies were supported by a South Australian Environment Protection Act-accredited site contamination auditor.

**Outcome**  
Following our assessments and the extensive planning work undertaken by our client, 99.5% of spoil will be diverted from landfill and is being stockpiled for reuse on other projects along the North-South Corridor. Only 0.5% of spoil could not be reused, as agreed with the site contamination auditor. Diversion of spoil from landfill and topsoil reuse contributed to the project obtaining the top ‘Leading’ design rating under the Infrastructure Sustainability Council of Australia (ISCA) IS rating scheme.

# Take the tram!

**Project**  
Bergen Light Rail Stage 3

**Location**  
Norway

**Client**  
Bybanen Utbygging

**Expertise**  
Devising environmental principles and environmental assessment

**Opportunity**  
Moves are being made worldwide to get people out of their cars and on to public transport. It’s one of the best ways to reduce traffic congestion and improve air quality in our ever-growing cities. Stage 3 of Bergen Light Rail extends the network by 7.8km – 2.8km running through tunnel – and will link the existing tram network to a new terminal at Bergen Airport. Sustainability principles were integral to the overall engineering design process, and we had to ensure that our international skills and knowledge were applied in a manner suitable for Bergen.

**Solution**  
We carried out a detailed review of environmental legislation and licensing and permitting requirements. Site visits were carried out to identify environmental constraints, and consultation was undertaken with city and county authorities. Construction involved rock blasting, and mitigating the potential impacts of this was particularly important. We assessed effects on residential, industrial and commercial properties, and devised a rock blasting strategy for the contractors to minimise noise and vibration levels. We optimised the design so potential nuisance levels associated with operational noise and vibration would be limited to just a few locations and effectively mitigated.

**Outcome**  
The Bergen Light Rail network has made the city accessible for everyone, and passenger numbers have grown more strongly than expected. About 7M passengers used the service in 2010. This grew to 9M with the opening of stage 2 in 2013. It’s projected that about 45,000 passengers per day – more than 16M per year – will be using Bergen Light Rail when Stage 3 is fully completed in summer 2017. It provides a reliable, safe, comfortable and frequent alternative to the car for commuters and has prompted a shift to a more sustainable transport system, reducing congestion and improving environmental conditions for all. Residents have taken it to their hearts, and the motto “Gå ta banen!”, or “Take the tram!”, has become a catchphrase.





Opening opportunities with connected thinking.

For more information, search 'Mott MacDonald, Environment' or contact [environment@mottmac.com](mailto:environment@mottmac.com)

**mottmac.com**