Blackpool, England's iconic seaside resort town, is synonymous with the traditional British beach holiday. Its famous promenade, piers and seafront have historically been a major tourist attraction for the area.

However, due to an encroaching coastline high sea walls were built to prevent negative effects on the town. Not only did this cut off visitors from the Blackpool's major attraction – the beach – but it was also failing to hold back increasingly stormy high seas associated with a changing climate.

The once-thriving seaside town's tourist appeal had declined over time, particularly due to these influences.

As a result, national and local governments took steps to consider a redevelopment of the coastline to address the coastal erosion and improve the social and economic state of the area.

The solution was to replace the wall with a sloping set of steps along the length of the seafront. The design of the steps breaks up the force of the waves while improving access for pedestrians to and from the beach.

Not only has the project helped improve the tourist appeal of Blackpool's promenade, but it is a key example of how climate change is impacting infrastructure and measures that can be taken to work with the environment, not against it.

The redevelopment of Blackpool's coastal infrastructure in consideration of a changing climate in infrastructure management was an example Michael Nolan, Chair of the United Nations Global Compact Cities Program, cited in his keynote presentation on the second day of the joint 38th Australasian Transportation Researchers' Forum (ATRF) and 27th ARRB Conference, held in Melbourne this past November.

The joint conference provided a platform for road and transport professionals from around Australasia to share the latest ideas, knowledge and technologies influencing the economic and social impacts of road infrastructure.

It also gave delegates opportunities to gain insights from different government and industry views through the wide-ranging technical sessions and workshops held over the three days.

Climate change was a significant talking point at the conference and one on which Mr. Nolan and his fellow presenters shared valuable learnings and perspectives.

A major focus was how the planet's rapidly changing climate can impact road and transport infrastructure, and what is being done to adapt to those changes in some cases.

Mr. Nolan emphasised that addressing climate change through collaboration between government and the private sector is needed. As the economic costs of natural disasters are significant, there needs to be more cohesion between the two sectors to address the issues.

The collaborative approach employed on the Blackpool redevelopment project was a good example of various organisations and bodies working together successfully to address a climate change challenge, while opening economic and social opportunities at the same time.

Mr. Nolan said there is a robust business case for the private sector to be involved in such activities, particularly as climate change may present such opportunities. He also asserted that consideration needs to be made for how the environment is affecting us, not just on how we're impacting on the environment.

Christian Axelsen, Research and Design Academic Specialist at the Danish Road Directorate, talked to delegates about the Committee for Economic Development of Australia's (CEDA) task group and its focus on the applications and learnings involved in delivering climate change adaptation strategies.

He explained how Europe is using certain templates for such strategies for infrastructure, and a key area to explore was the appropriateness of applying these models in an Australian context.

These strategies help encourage adaptation activities to become an integrated part of any national road administrator or state road body, from planning a road to operation and maintenance.
Some highlighted concepts were as simple as creating a weather event database and recording information to show how climate change is affecting a road network over an extended period.

Mr. Axelsen said that adaption strategies include both hard and soft infrastructure measures – hard being concepts such as alternative road surface treatments, intelligent transport systems and levees, while soft measures incorporate coastline restoration and designing waterfronts to accommodate changing water levels.

He also identified the numerous challenges involved in adapting such approaches, including political difficulties and even resource demand.

Deputy Director – General Infrastructure Management and Delivery at the Queensland Department of Transport and Main Roads (TMR) Miles Vass gave a local perspective by outlining the extensive process the Queensland Government undertook to repair and strengthen the state’s road network following the flooding and cyclone events between 2011 and 2013.

The process was not just about building the resilience of the physical infrastructure, but the resilience of the community. It involved getting everything back to normal after the events, which were made even more complicated by the statewide impact of them and the challenging time frames in which to work.

He said as much as 80 per cent of Queensland’s road network was closed at one time during the flooding events – a serious statistic that showed their true burden on the region.

Mr. Vass also talked about opportunities presented in the overall program of works (known as the Transport Network Reconstruction Program), such as utilizing different pavement treatments and improving the infrastructure to better withstand future events. He further explained some of the successes, including the value for money outcomes and delivery standards that followed.

Providing a local context about the repercussions of such weather events, and even climate change, presented delegates with food for thought, particularly with the topic of climate change itself such a big talking point in the media nationally and internationally.

ARRB has worked closely with TMR since the completion of the reconstruction program, and ARRB Pavements Engineer Andrew Beecroft explained how new pavement treatments could be applied in this context.

“State road authorities are under increasing pressure to justify their spending and, in Queensland in particular, during the reconstruction program, a lot of innovative technologies were used, including cement treated pavements and foamed bitumen pavements,” he said.

“These technologies have been shown to have big benefits, but there wasn’t a lot of work being done to show what these benefits were and how they impact the whole of life costs of pavements, especially in light of the risk of more extreme weather events under the effects of climate change,” he says. “That’s something that we really wanted to look at and provide increased justification to road authorities to allow them to spend a little bit more money to have an improved whole-of-life economic benefit.”

Disrupting the future

Since the first Australian driverless vehicle trial in South Australia in November 2015, the nation’s states and territories are putting plans and measures in place to adopt the technology.

The topic of autonomous vehicle technology, as well as inter-connected concepts and the opportunities they present, were major focuses at the joint ATRF and ARRB conference.

Kirsten Dunlop, Executive General Manager of Strategic Innovation and Personal Insurance at Suncorp, gave an in-depth talk on the different apps, concepts and ideas being introduced around the world that may change how people move around, specifically through notions such as car sharing.

Beyond already established apps, such as Uber, Dr. Dunlop talked about new ideas like Link & Co, which is being developed to allow users to essentially share out their car when it’s not in use. She explained that there are still myriad questions to consider in this space, for example who the customers for this type of application are.

Dr. Dunlop raised further questions about the notion of mobility as a service and how these future technologies will affect how the public uses cars and transport. She exemplified the London Oyster card in this case. Since its introduction in 2003, there has been a 53 per cent increase in the use of public transport across the city.

When more integrated mediums are introduced, such as those utilising real-time data and information, they may provide further opportunities for the future. These include concepts such as car systems that are fully integrated so that they could potentially book cars into services and even secure paid parking spaces independently. She also touched upon the role of the insurer when these disruptive technologies arrive and how that may change.

Hussein Dia, Associate Professor at Swinburne University’s Centre for Sustainable Infrastructure, followed Dr. Dunlop by exploring ideas around self-driving vehicles and shared mobility, and how the narrative of mobility is changing.

He said the focus is not just on building roads, but also on demand management and resilience. The emphasis is also shifting from simply moving vehicles around the network to mobility that helps people to access jobs, services and provides economic opportunities.
Dr. Dia explained these concepts through the changes that may occur in private car ownership and the impact of car sharing and road sharing.

He also talked about autonomous vehicles and the potential for these to affect the future of urban mobility, particularly as government, industry and the private sector become more prepared for when they are introduced.

"A lot of investment has gone into the infrastructure for connectivity between vehicles, and I think it will need to continue because driverless cars are coming but they're not going to be here in full deployment for maybe 15, 20 or even 30 years," says Dr. Dia following his keynote presentation.

"We're going to have a period where there will be fleets of autonomous vehicles sharing the road with fleets of driven vehicles. That's going to introduce some challenges.

"This is where the infrastructure will need to remain smart and become even smarter until we reach a point where perhaps there is 100 per cent market penetration of autonomous vehicles. In this case, the infrastructure is still needed and needs to be smart because it can help vehicles to see around corners and to help the vehicles communicate with each other as well," he adds.

Likewise, he says managed motorways will have a particularly important role in how Australians utilise the transport and road infrastructure network.

"Managed motorways continue to attract a lot of research and applications, and I think Melbourne is one of the world leaders. Melbourne is a leader in Australia as well in the deployment of sensor technologies but also smart software and algorithms that run these systems," he says. "There's a lot of research and disruptions actually coming from the private sector with ride-sharing through very little expenditure," he adds. "Consumers and travellers are getting access to new modes of mobility and transport, which, in my opinion, is good because this makes a range of options available to people and in the long run they will reduce our reliance on private vehicles and promote more car-sharing and ride-sharing, which I think we need for smart cities."

Tony Braxton-Smith, Deputy Secretary, Customer Services Division at Transport for New South Wales, also discussed his organisation's draft roadmap for the state's future transport road system. He provided some extensive insight from a state perspective on the influence of disruptive technologies like driverless vehicles, big data and intelligent transport systems in the future.

After the keynote presentations, the third day of the conference culminated in an extensive session on the Australian Driverless Vehicle Initiative and the major milestones it has achieved, in addition to recent activities and industry updates. Michael Regan from ARRB Group, Brian Haratsis from MacroPlan, Greg Bosnich of Volvo Australia, Peter Damen from the ADVI and Pat Walker from RAC WA spoke on the topic, providing updates on the progress made by the initiative and its focuses for the future.

Planning for the future

The conference program also included a focus on the future of road and transport infrastructure from a demand management perspective.

Michel Masson, CEO of Infrastructure Victoria, talked to delegates about the role of his organisation and the process it undertook putting together its 30-year infrastructure plan, the draft of which was released this past October.

Mr. Masson explained that a key challenge for road and transport infrastructure in Victoria was about managing demand, especially with the introduction of concepts such as Uber.

He highlighted concepts such as increased population densities in established areas and the need to increase investment in social and affordable housing to allow people to live closer to where they work.

These different concepts are ones that Infrastructure Victoria took into consideration when mapping demand for road infrastructure in its plan.

A collaborative approach

This year’s event was the first time both conferences have been run in tandem, signifying a shift in the way in which the Australasian transport and infrastructure sector aims to make progress.

This emphasis on collaboration was highlighted when, at the event’s close, ARRB and the Institute of Public Works Engineering Australasia Queensland signed a memorandum of understanding.

The two industry bodies agreed to a way in which they will collaboratively seek to transfer best practice transport and roads management knowledge to both their members and the industry in Queensland.

Charles Karl, National Technical Leader Journey Management at ARRB, that the conference provided a comprehensive array of topics, and agreed that Mr. Masson's emphasis on managing demand was a recurring theme throughout the event.

He said that the combination of the ATRF and ARRB conferences showed that industry is working together and recognising that a combined approach is needed for the future of the nation's road and transport infrastructure, particularly under a safe systems concept.