
IRF
GLOBAL
The Future of Roadways:
Green, Equitable, Intelligent & Integrated
IRF GLOBAL
ROADS2TOMORROW (R2T)
CONFERENCE & EXHIBITION
Orlando, FL, USA
December 10 - 13, 2024
SCAN FOR
INTERACTIVE AGENDA
www.IRF.global/r2t

I am delighted to welcome a diverse and distinguished gathering of professionals committed to advancing roads and mobility. This conference serves as a pivotal platform for innovation, where global leaders come together to share insights, challenge the status quo, and shape the future of transportation.

The IRF Global R2T Conference offers unparalleled opportunities for learning, sharing expertise, and fostering collaborations. Our program features keynote speeches from the sector's top thought leaders, interactive sessions on cutting-edge topics, and extensive networking opportunities to connect with peers and industry leaders. This year, we will address a myriad of pressing issues—from groundbreaking material innovations and strategies for decarbonizing transport to preparing infrastructure for autonomous vehicles.

Your participation is essential in enriching our discussions and strengthening our collective efforts toward excellence in the road sector. I encourage you to seize this opportunity to engage deeply, forge lasting partnerships, and depart with valuable insights that will enhance your contributions to our shared mission of creating a more connected and sustainable world.

Eng. Abdullah Al-Mogbel
Chairman Emeritus (for Life)
International Road Federation

ABOUT IRF

Our Mission: Building Partnerships

We assist countries in progressing towards better, safer and smarter road systems.

We develop and deliver world-class knowledge resources, advocacy services, and continuing education programs, which together offer a global marketplace for best practices and industry solutions.

We serve a wide range of member organizations from both the public and private sectors of the road and transport industry. Together, we form a global network for information exchange and business development.

We invest in the next generation of transport leaders. Since 1949, the IRF has awarded educational scholarships to individuals in 119 countries to pursue careers in the road and transport industry.

Our Vision: Better Roads. Better World.

We believe that well-planned, safe, accessible and environmentally sound road networks are fundamental building blocks for human and economic development.

We are committed to increasing road and transport investments to meet the demands for safe and efficient travel and flow of goods and services to help improve the lives of people worldwide.

We engage with governments, development institutions, businesses, and academia around the world to make our vision a reality.

Our Organization

The International Road Federation is a global not-for-profit organization, headquartered in Washington, DC since 1948 and supported by regional offices throughout the world. The IRF serves a network of public and private sector members in more than 70 countries by providing world-class knowledge resources, advocacy services, and continuing education programs which together offer a global marketplace for best practices and industry solutions.

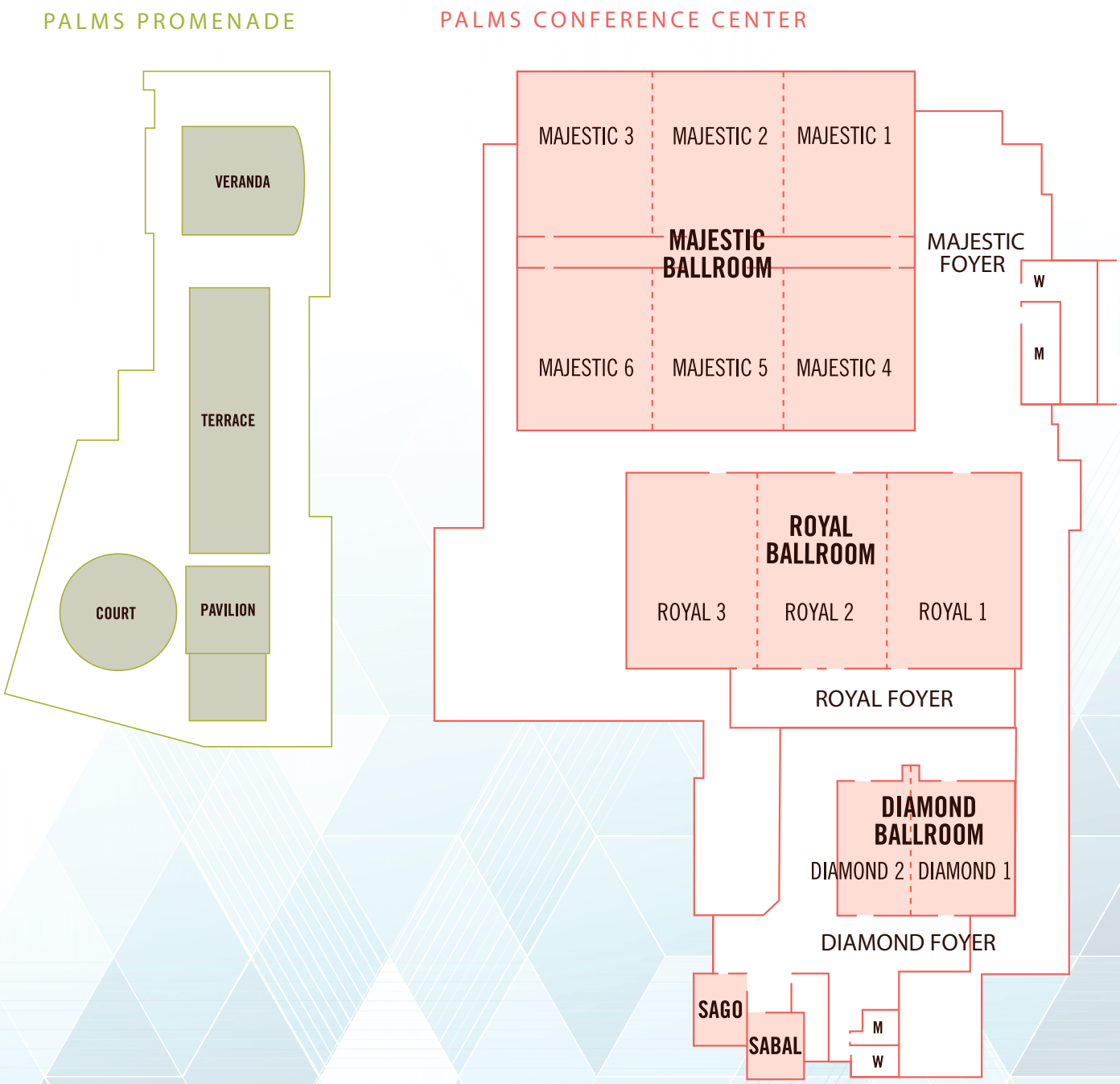
VENUE

Palms Conference Center
DoubleTree by Hilton Orlando at SeaWorld

EVENT HOURS

Tuesday, December 10, 08:30 – 19:30
Wednesday, December 11, 09:00 – 17:30
Thursday, December 12, 08:00 – 22:00
Friday, December 13, 09:00 – 17:00

VENUE MAP



MS	ES	TS	WS & SS	IRF	SN
Plenary Sessions	Executive Sessions	Technical & Poster Sessions	Workshops & Special Sessions	IRF Meetings	Social & Networking

*Session details available at **https://irfglobalr2tconference2024.sched.com***

DECEMBER 10 • TUESDAY	
08:30 – 09:30	Committee on Road Asset Management • *Diamond 1*
10:00 – 13:30	Road Pricing | The Future of Infrastructure Funding in the US? • *Diamond 1*
11:00 – 12:00	Committee on Road Safety • *Diamond 2*
12:00 – 13:30	TS9.4: Electric Vehicle Infrastructure and Smart Roads • *Silver*
12:30 – 14:00	Everything You Want to Know About Fiber Reinforced Asphalt Concrete • *Diamond 2*
14:00 – 15:00	Implementation of Solid Earth for Soil Stabilization, Dust and Erosion Mitigation • *Diamond 2*
	TS6.1: Public Transport Systems and Sustainable Urban Mobility • *Silver*
14:15 – 15:15	Committee on ITS • *Diamond 1*
15:15 – 16:15	General Assembly (IRF Global Members in Good Standing Only) • *Diamond 2*
16:30 – 17:30	Board of Directors Meeting (IRF Global Board Members Only) • Diamond 1
18:00 – 19:30	Reception • Pavillion

DECEMBER 11 • WEDNESDAY	
09:00 – 09:30	Opening Ceremony • *Majestic 4,5,6*
09:30 – 10:45	Opening Session: Roads to Tomorrow: Navigating the Future of Roads & Mobility • *Majestic 4,5,6*
10:45 – 11:15	Networking Break (Refreshments Served) • *Majestic 1,2,3 - Exhibit Hall*
10:45 – 18:00	Exhibit Hall Open • *Majestic 1,2,3*
11:15 – 12:45	ES1: Urban Digital Twin and GeoAI for Monitoring Autonomous Vehicle's Impact on Built Environment • *Majestic 4*
	ES2: Revolutionizing Road Construction: Cutting-Edge Innovations • *Majestic 5*
	TS3.9: Pavement Performance Assessment and Lifecycle Analysis • *Diamond 1*
	TS7.1: Travel Demand Management and Data-Driven Transportation Solutions • *Diamond 2*
	TS9.1: Intelligent Transportation Systems (ITS) and Future Mobility • *Majestic 6*
12:45 – 14:00	Lunch • *Majestic 1,2,3 - Exhibit Hall*
14:00 – 15:30	ES3: Reimagining Alternative Delivery through Florida's Modified Phased Design Build • *Majestic 4*
	ES4: Advancements in Computer Vision Technology and Its Application in Traffic Safety • *Majestic 5*
	TS2.2: AI and Big Data: Revolutionizing Asset Management in Transportation Networks • *Majestic 6*
	TS2.3: Innovative Materials and Techniques in Pavement Preservation • *Diamond 1*
	TS2.5 Bridge Management & Inspection • *Diamond 2*
15:30 – 16:00	Networking Break (Refreshments Served) • *Majestic 1,2,3 - Exhibit Hall*
16:00 – 17:30	ES5: ITS for Pedestrian and Two Wheeler Safety • *Majestic 4*
	ES6: Road Pricing in the USA: Update of State and National Development • *Majestic 5*
	TS2.4: Performance-Based Contracts and Infrastructure Evaluation • *Diamond 1*
	TS8.1: AI and Advanced Technologies in Infrastructure and Bridge Projects • *Majestic 6*
	TS8.2: Digital Infrastructure and Smart City Initiatives • *Diamond 2*

DECEMBER 12 • THURSDAY	
08:00 – 09:00	● TS9.5: Automated Vehicles, Electrifiction and Connected Technology • *Diamond 1*
09:00 – 18:00	Exhibit Hall Open • *Majestic 1,2,3*
09:00 –10:30	● ES7: Innovative Traffic Management: Intelligent Solutions for Borders, Highways, and Airports • *Majestic 5*
	● TS2.7: Data-Driven Approaches to Road Condition Monitoring and Maintenance • *Majestic 4*
	● TS9.3: Intelligent Transportation Systems and Digital Infrastructure • *Majestic 6*
09:15 –10:45	● TS4.5: Innovative Incident Detection and Road User Behavior • *Diamond 1*
10:30 –11:00	Networking Break (Refreshments Served) • *Majestic 1,2,3 - Exhibit Hall*
11:00 –12:30	● ES8: Advances in Roadside Safety • *Majestic 5*
	● TS2.8: Advanced Technologies for Road and Bridge Monitoring • *Majestic 6*
	● TS2.9: Road Asset Management and Maintenance Strategies • *Diamond 2*
	● TS4.6: Protection of Vulnerable Road Users • *Diamond 1*
	● TS4.7: Road Design, Alignment, and Safety Measures • *Majestic 4*
12:30 – 14:00	Lunch • *Majestic 1,2,3 - Exhibit Hall*
14:00 – 15:30	● ES9: Emerging Trends in Data, Analysis, and Travel Behavior • *Majestic 5*
	● ES10: Innovative Applications of Machine Learning in Intelligent Traffic Safety • *Majestic 4*
	● TS3.1: Innovative Materials for Road Construction • *Majestic 6*
	● TS4.1: Community and Policy-Driven Road Safety Initiatives • *Diamond 2*
	● TS4.3: Innovative Road Safety Strategies and Assessments • *Diamond 1*
15:30 – 16:00	Networking Break (Refreshments Served) • *Majestic 1,2,3 - Exhibit Hall*
16:00 – 17:30	● TS3.3: Pavement Testing and Structural Assessment • *Diamond 1*
	● TS3.4: Sustainable Practices and Materials in Pavement Engineering • *Majestic 4*
	● TS4.4: Artificial Intelligence and Road Safety: Concepts and Applications • *Diamond 2*
19:30 – 22:00	**GALA & AWARDS DINNER** • *Orange Ballroom A&B*

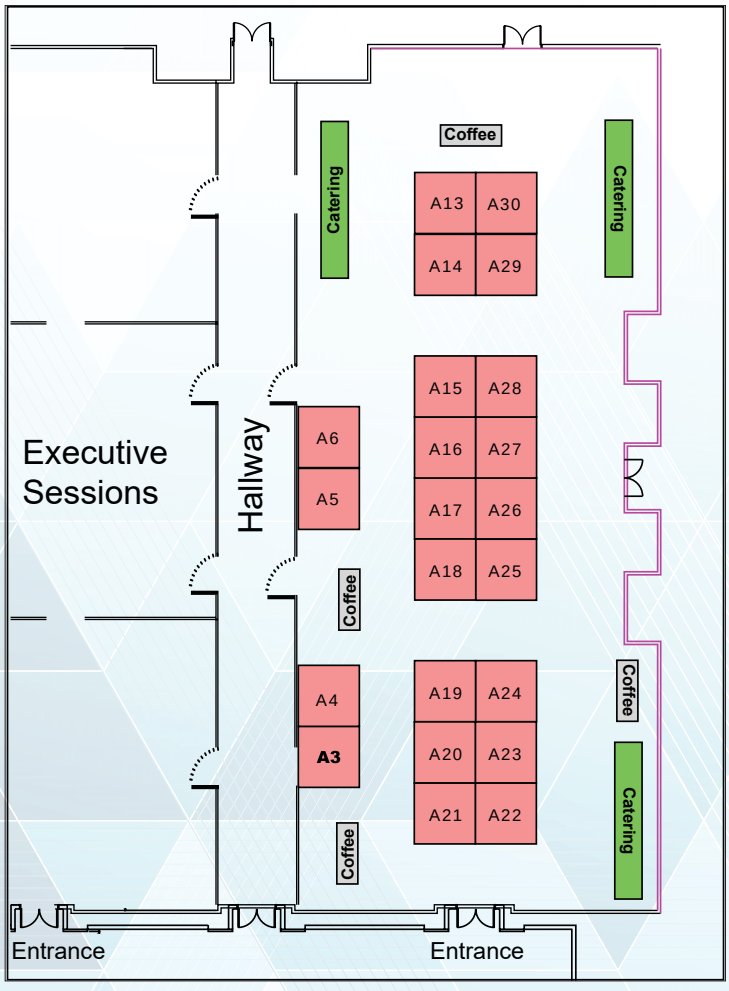
Please scan the QR code to view the session & speaker details

www.IRF.global/r2t

MS	ES	TS	WS & SS	IRF	SN
Plenary Sessions	Executive Sessions	Technical & Poster Sessions	Workshops & Special Sessions	IRF Meetings	Social & Networking

DECEMBER 13 • FRIDAY	
09:00 – 10:30	ES11: Towards Net Zero: Paving the Way for a Greener Future • *Majestic 5*
	TS3.5: Recycling and Rejuvenation Techniques • *Majestic 6*
	TS4.8: Work Zone Safety and Monitoring • *Majestic 4*
	TS5.1: Disaster Management & Building Resilient Roadways • *Diamond 1*
10:30 – 11:00	Networking Break • *Majestic Pre-Function*
11:00 – 12:30	TS3.6: Leveraging Advanced Additives and Modeling for Improved Pavement Engineering Outcomes • *Diamond 2*
	TS3.8: Advancements in Road Construction Materials and Techniques • *Diamond 1*
	TS5.3: Sustainable Transportation and Environmental Impact Mitigation • *Majestic 5*
12:30 – 13:00	Closing Ceremony: On the Road LA 2025 • *Majestic 5*
13:00 – 17:00	Technical Tours & Site Visits

EXHIBITOR DIRECTORY



- A3: IRF Global
- A4: Miyagawa Kogyo Co., Ltd
- A5-A6: King Ho Tai International Co., Ltd.
- A13: Fortis Consulting Services Corp.
- A14: J-Tech
- A15: All Chemie Belgium (ACB Group)
- A16: NewRoad
- A17: ESRI
- A18: TrafFix Devices Inc.
- A19: Pavemetrics
- A20: XenomatiX
- A21: Stalker Street Dynamics
- A22: Forta
- A23: aerogel Coating Technologies
- A24: Solid Earth, Inc.
- A25: Heat Design Equipment Inc
- A26: ARRB Systems (ARRB)
- A27: Nite Beam Products
- A28: Teijin Frontier Co., Ltd.
- A29: NEXCO-West USA, Inc.
- A30: Newbeg Inc.

SCAN FOR EXHIBITOR PROFILES

PLATINUM SPONSOR

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WITH GIS
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Transportation agencies worldwide are building the infrastructure of the future to achieve greater mobility and more seamless supply chains to increase economic development. Whether constructing new highways or leveraging the latest technologies for traffic management, agencies want to be assured they are making the most strategic investments.
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Cold-Mix New Aggregate Paving Material
Cold-Mix Reclaimed Pavement New Material

Comparing the test results with hot-mix asphalt concrete, the cold-mix method is greater than the standard values and better than the hot-mix method .

	Hot Mix 3/8" Asphalt Concrete	Hot Mix 3/4" Asphalt Concrete	Resin-added Cold Mix Concrete Pavement	Resin-added Cold Mix Reclaimed Asphalt Pavement
Marshall test	Specification ≥1800lbf	Specification ≥1800lbf	No specification	No specification
Test value	≒ 3600lbf	≒ 3800lbf	Above 4738lbf	Above 4851lbf
Hamburg Wheel Tracking Test	Set the test temperature to 60°C , the rut to 12.5mm the rolling times need to exceed 12,000			
Test value	7000~8000 times	15000 times	16000 times	16000 times

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الهيئة العامة للطرق
Roads General Authority

Roads General Authority

RGA is a Saudi governmental entity established in 2022 and headquartered in Riyadh. It aims to develop the roads sector in Saudi Arabia by setting policies and standards to enhance safety and quality. RGA works to attract investments, conduct studies and research, and coordinate with relevant entities to ensure the efficiency of the road network and meet sustainable growth needs.

Objectives

- Regulate and oversee the roads sector.
- Enhance traffic safety.
- Strengthen competitiveness in road construction.
- Encourage innovation for road sector development.

Road Sector Strategy

The strategy is built on three main pillars

01 Quality

02 Safety

03 Traffic density

Goals

- Elevate Saudi Arabia's ranking in road quality to 6th globally.
- Reduce road fatalities to fewer than 5 per 100,000 inhabitants.
- Maintain advanced service levels for the capacity of the road network.
- Increase private sector participation in operational activities to %20.
- Ensure road networks are equipped with safety measures in line with the International Road Assessment Program (IRAP).

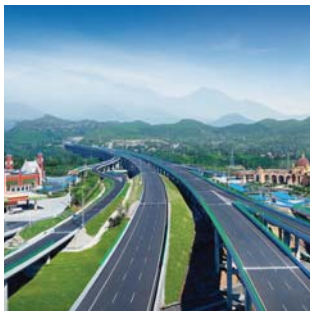
RGAsaudi | www.rga.gov.sa







2024 IRF GLOBAL ROAD ACHIEVEMENT AWARDS







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MORE THAN AN INDUSTRY ACCOLADE

H.E. Abdullah A. AlMogbel
Chairman Emeritus for Life
International Road Federation

The IRF Global Road Achievement Awards (GRAA) Program was founded to publicize to the world the innovative, practical, creative, cost-saving and sustainable solutions the road industry provides to societies and economies.

Instituted in 2000, the GRAA Program has distinguished more than 260 projects, products and technologies from around the world. Today, the Awards are recognized as a prestigious industry accolade in their own right, but they also serve to remind a much wider audience that the mobility everyone takes for granted would not be possible without the talent and commitment of our industry. Lastly, the IRF Awards are an accelerator of progress and ideas: by showcasing our achievements, we are able to learn from each other, and build on our successes.

On behalf of IRF Global and our international panel of independent judges, I would like to congratulate the winners of the 2024 IRF Global Road Achievement Awards. They are an asset to an industry that is constantly investing in new solutions to deliver gains and sustainability advances that benefit everyone.

The diversity and quality of this year's winning projects are also a great testament to IRF Global's status as the international marketplace for best practices and industry solutions.

I invite you to examine them in detail and to submit your own exemplary projects to the 2025 GRAA Competition.

ASSET PRESERVATION AND MAINTENANCE MANAGEMENT

SOUTHERN CROSS-ISLAND HIGHWAY-A DECADE OF EFFORTS IN MAINTENANCE, REHABILITATION, AND RECONSTRUCTION

HIGHWAY BUREAU, MOTC, TAIWAN

The Southern Cross-Island Highway, a vital 204-kilometer route traversing Taiwan's Central Mountain Range, was severely damaged by Typhoon Morakot in 2009. This document details the extensive reconstruction efforts undertaken over a decade to restore functionality and ensure the highway's long-term sustainability.

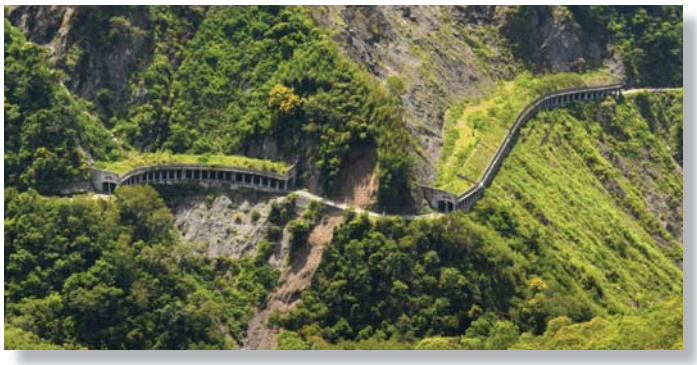
Devastation and Response:

Typhoon Morakot's record-breaking rainfall caused catastrophic damage, including:

- Roadbed loss and subbase depression
- Bridge collapses and embankment failures
- Riverbed elevation and widespread landslides

The Highway Bureau implemented a three-phased strategic reconstruction program:

- **Short-term (2009-2017):** Emergency repairs to maintain minimal traffic flow, focusing on stabilizing the most critical sections.
- **Mid-term (2017-2022):** Structural reinforcement projects to improve traffic capacity and prevent future disasters. This involved securing embankments, preventing rockfalls, and restoring vegetation.
- **Long-term (2022-present):** Disaster-resilient reconstruction in severely affected areas, including building new bridges and open-cut tunnels.



Recovery and Innovation:

By 2022, the Southern Cross-Island Highway was fully reopened to traffic. The project's success can be attributed to several factors:

- **Strategic reconstruction plan:** The phased approach allowed for efficient resource allocation and targeted interventions.
- **Advanced technologies:** Lidar, UAVs, and InSAR were used to assess damage, monitor progress, and inform reconstruction strategies.
- **Emergency preparedness:** Optimizing emergency response times and deploying real-time monitoring systems improved safety and incident management.
- Sustainable practices: The project prioritized ecological balance by restoring vegetation, implementing rest days for ecosystem recovery, and employing local indigenous people as highway patrols and gatekeepers.

Outcomes and Impacts:

The reconstruction project achieved significant results:

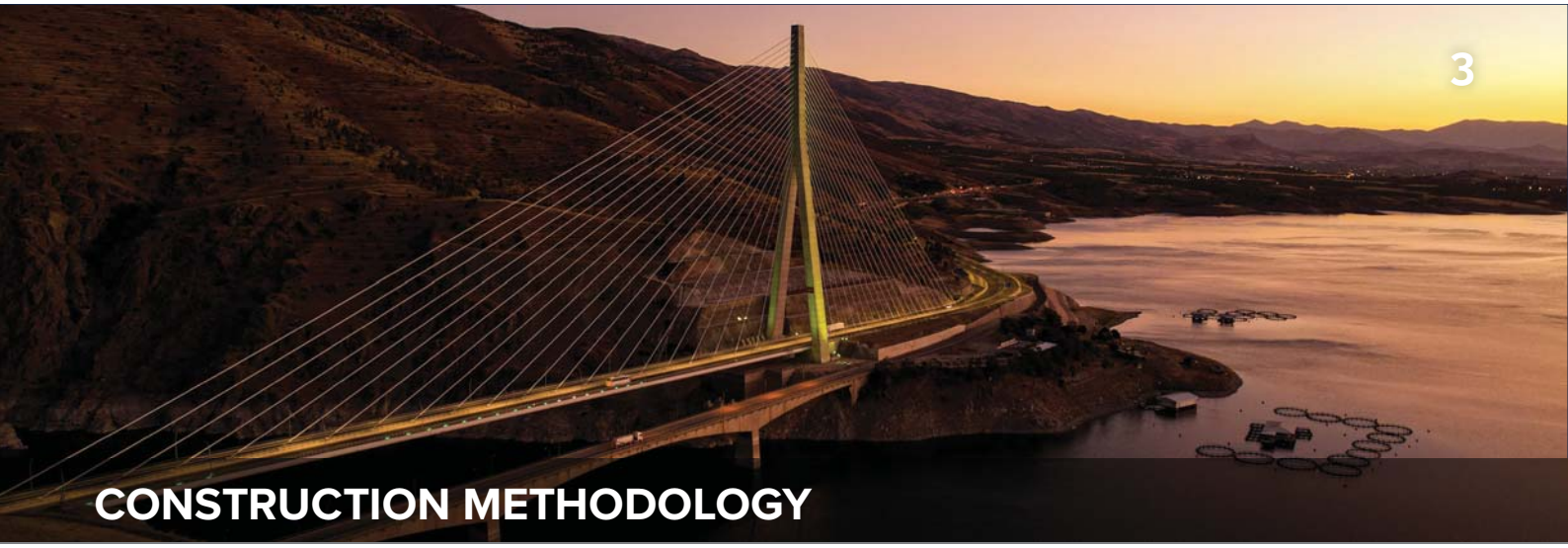
- Infrastructure restoration: Over 78 kilometers of roadbed, 15 open-cut tunnels, and 24 bridges were rebuilt.
- Enhanced communication: 5G network coverage and power systems were strengthened, ensuring connectivity and reliability.
- Improved safety: Measures like automatic vehicle plate monitoring and routine emergency drills enhanced safety for motorists and residents.
- Economic revitalization: Reopening the highway revitalized tourism and facilitated economic activity in the region.
- Community engagement: Local communities were actively involved in reconstruction and environmental protection efforts.

Looking Ahead:

The Southern Cross-Island Highway's successful reconstruction serves as a testament to the Highway Bureau's commitment to resilience and sustainability. Ongoing maintenance and rehabilitation strategies, combined with continuous monitoring and emergency preparedness, will ensure the highway's long-term functionality and safety, while preserving the delicate ecosystem of the Central Mountain Range.

Wen-Rui Chen
Director General of the Highway Bureau (MOTC)

" The strategic three-phase approach prioritizing sustainability, ecological balance, and community well-being is exemplified by the prestigious IRF award and recognized for a decade of effort. "



CONSTRUCTION METHODOLOGY

KÖMÜRHAN BRIDGE

MINISTRY OF TRANSPORT AND INFRASTRUCTURE, REPUBLIC OF TÜRKİYE

Elazığ province, which has a history of more than 4 thousand years and which is established at the foot of Harput, is named as the 'Holy city' thanks to its air, water, soil and people. The city is surrounded by Keban and Karakaya Dams, which are located within the large arch drawn by Euphrates River.

This bridge, which is constructed right next to Kömürhan Bridge that was constructed on the Euphrates River in 1980s, constitutes an important section of the road (5.155 km), which is constructed with high standards thanks to its tunnels, at-grade intersections and bridge crossings.

Main span of Kömürhan Bridge, which is constructed by Doğuş-Gülsan Joint Venture, is 380 meters, and the cross section of a very large part of the aforementioned span consists of an orthotropic steel deck. Total length of the bridge is 660 meters, including 100 meters of posttensioned concrete approach slab, which is connected to the tunnel from Elazığ direction, and an anchorage block of 180 meters coming from the direction of Malatya.

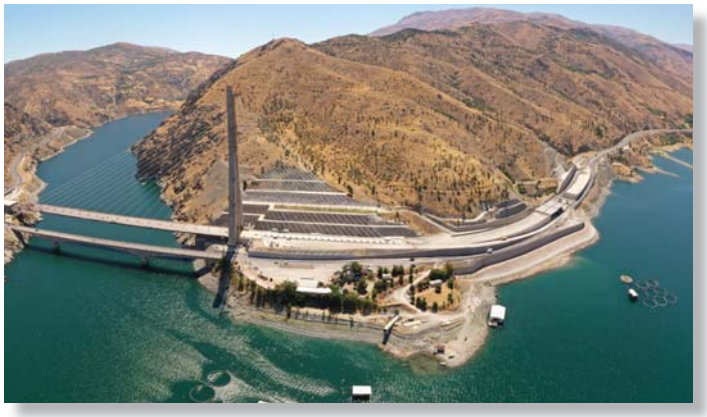
The width of the structure is 25 meters at main span, and it included a 2x2 traffic lane. The approach slab of 100 meters has a posttensioned box-type cross section, and its width reaches to 30.60 meters when it is being connected to tunnels. Transverse posttensioning is also used on the posttensioned concrete.

Kömürhan Bridge is the first and only single-pylon cable-stayed of our country, and it is listed among top four bridges that show such characteristic globally. On the bridge, 2x1 cables are organized in the middle of the deck and in a way to be located on a single plane. Deck is embedded in the pylon. Cables are comprised of 7-Wire low-relaxation 15.7 mm strands (tensile strength: 1860/670 MPA) Amount of strands used in cables:

Amount of S355J2+N steel that is used to build Kömürhan Bridge is 7000 tons, and it is equal to the amount of steel used to build Eiffel Tower. Length of the weld seam, which is used in transverse and longitudinal assembly of segments, is approximately 450.000 meters. The length of strands, which are used in cables that connect steel segments to the tower, is 853.000 meters.

Pylon bolt, total height of which is 168.5 meters, is in the shape of a reversed Y, and it is comprised of a reinforced concrete box girder. Individual steel cores are created in areas where anchorages of cables are present in the pylon. The pylon is placed on the ground through 46.5x16.0x7.0 meters headstall sitting on 2 reinforced concrete caissons of 15 meters in diameter and 22.5 meters in depth, which are arranged under beam level.

Kömürhan Bridge and Tunnel, which is opened to traffic on 02.01.2021, is located in a strategic location on roads that connect East Anatolia Region and Southeastern Anatolia Region to each other, as well as Central Anatolia Region and Mediterranean Region.



Abdulkadir URALOĞLU
Minister of Transport and Infrastructure of the Republic of Türkiye

"We are very honored to be awarded the Construction Methodology award by GRAA, which is highly respected around the world. Winning awards is of great importance for our country as it confirms our relentless efforts and outstanding performance. This recognition, which is a testament to teamwork, innovation and the pursuit of excellence, encourages us to outdo ourselves and achieve even greater success in the future. "

DESIGN

KINMEN BAY BRIDGE PROJECT

FREEWAY BUREAU, MOTC, TAIWAN

The Kinmen Bay Bridge, completed in October 2022, stands as a testament to innovative engineering and collaborative effort. This 4,770- meter-long bridge connects Kinmen and Lieyu Islet, previously solely reliant on ferry services often hampered by seasonal fog and challenging weather. The bridge not only provides a reliable transportation link but also boasts a unique aesthetic design that reflects the local culture and landscape.

Overcoming Challenges through Innovative Design:

The construction of the Kinmen Bay Bridge faced numerous challenges, demanding ingenious solutions and meticulous planning.

• **Complex Geology:** The bedrock, consisting of weathered granite with varying depths and conditions, required the use of reinforced concrete piles and additional drilling tasks to ensure stability. The team employed real-time drilling adjustments and specialized techniques to overcome the complexities of the granite basin.

• **Steep Basin and Strong Tidal Surge:** To counteract the challenges posed by the deep basin and strong tidal currents, the bridge design incorporated anti-scouring protection works, braced cofferdams, and structural reinforcement to withstand breaking waves and high tidal surges.

• **Extreme Seasonal Weather Conditions:** The bridge's design and construction addressed the region's extreme weather, including typhoons and dense fog. This involved increasing the concrete's protective cover, utilizing hot-dip galvanized steel bars, implementing a multi-protection cable system, and installing a comprehensive bridge monitoring system for long-term performance evaluation.

• **Tight Schedule and Long Shipping Distance:** Efficient logistics planning was crucial due to the distance between Kinmen and mainland Taiwan, where many construction materials and precast box girders originated. A well-coordinated schedule ensured the timely delivery of materials and personnel, employing both sea and air transport as needed.

• **Offshore Construction Safety:** A comprehensive safety plan was implemented throughout the design and construction phases, with routine checks and risk assessments. Specific measures included monitoring the trestle bridge's integrity, establishing a marine traffic control team, and adhering to strict safety protocols on the floating platform.

A Scenic Bridge Reflecting Local Culture:

The bridge's design is not only functional but also aesthetically pleasing, reflecting the local culture and preferences. The "Sorghum-Shape" pylons, chosen through a public vote, harmonize with the surrounding landscape and offer a unique visual identity. Nighttime lighting further enhances the bridge's beauty and ensures safety for navigation.

Significance and Impact:

The Kinmen Bay Bridge has significantly improved connectivity and quality of life for the residents of Kinmen and Lieyu Islet. It provides a reliable transportation link, facilitates access to essential services, and promotes tourism. The bridge's resilience ensures its continued functionality even during challenging weather conditions, contributing to the region's economic development and social well-being.

Conclusion:

The Kinmen Bay Bridge serves as a shining example of successful bridge design and construction, overcoming numerous challenges through innovative solutions and a commitment to safety and aesthetics. It stands as a symbol of connection, resilience, and progress for the Kinmen region.

Yi-Fang Shih & Shing-Hau Jaw
Chairman, CECI & Director General of the Freeway Bureau (MOTC), Taiwan

" The Kinmen Bay Bridge project provides a vital, resilient, and scenic connection between Kinmen and Lieyu, significantly enhancing mobility and emergency services. The IRF GRAA fuels our continued pursuit of excellence for both organizations. "

ENVIRONMENTAL MITIGATION

HUIZHOU-QINGYUAN SECTION OF SHANTOU-ZHANJIANG EXPRESSWAY

GUANGDONG HIGHWAY, BRIDGE AND EXPRESSWAY CO., LTD.

The Huizhou-Qingyuan section of the Shantou-Zhanjiang Expressway (referred to as the "Huizhou-Qingyuan Expressway") is located in the central region of Guangdong Province, spanning the three cities of Huizhou, Guangzhou and Qingyuan, with a total length of 125.28 kilometers. It was completed and opened to traffic in October 2020. Since then, the driving time between Huizhou and Qingyuan was shortened from the original 3 hours to 1.5 hours, benefiting about 28 million local people. The Huizhou-Qingyuan Expressway passes through many national, provincial, municipal and county-level ecologically sensitive areas. The ecology along the route is beautiful, there are many scenic spots, and there are over 60 tourist attractions. Protecting the environment and implementing green construction are key difficulties of the project.

During the construction process, the project team of Huizhou-Qingyuan Expressway strictly implemented the philosophy of "technology driven, ecologically coordinated, constructed green, and intelligently managed", carried out 14 research programs, 35 green technology applications and 104 micro-innovations etc., summarized and formed 52 green highway construction systems, successfully overcame the difficulties of green highway construction and intelligent management of construction in ecologically sensitive areas, and created a "Huizhou-Qingyuan paradigm" for green highway construction.

The project team of Huizhou-Qingyuan Expressway has incorporated the "green gene" into the entire construction process, and successfully applied technologies such as ecological line selection, "permanent and temporary combination", tree transplantation, high-standard farmland embankment slope reduction, topsoil protection and utilization, and tunnel slag comprehensive utilization. A total of 10 ecologically sensitive areas were avoided, 20 "permanent and temporary combinations" of electricity use were achieved, and more than 2,000 precious trees were transplanted; 1.03 million cubic meters of topsoil were recycled and utilized, achieving a recycling rate of 100%; over 4 million cubic meters of tunnel slag along the entire line were recycled and utilized, effectively reducing the area of tunnel slag stacking site by nearly 700 mu, and achieving high economic and social benefits.

With fruitful results in green construction, the Huizhou-Qingyuan Expressway has been successively rated as a national soil and water conservation demonstration project of the Ministry of Water Resources, a demonstration green highway of the Ministry of Transport, a pilot project for science and technology demonstration and quality control, an excellent pilot project for a country with strong transportation network, and one of the "Top Ten Socially Responsible Projects of State-owned Enterprises in the Guangdong-Hong Kong-Macao Greater Bay Area (Ecological Civilization)".

Lv Dawei

Deputy General Manager, Guangdong Highway, Bridge and Expressway Co., Ltd.

"Lucid waters and lush mountains are invaluable assets. The project team of Huizhou-Qingyuan Expressway proposed the concept of green expressway construction at the initiation stage. During the construction process, a large number of green construction processes were applied. It has achieved great economic and environmental benefits. This time, we won the Global Road Achievement Award (GRAA) of IRF Global in recognition of our environmental protection efforts, we feel very honored and proud. We will continue to make more efforts in green construction and environmental protection and make greater contributions to the transportation industry and global sustainable development."

PROGRAM MANAGEMENT

MORAVA CORRIDOR MOTORWAY PROJECT

BECHTEL - ENKA

Bechtel and ENKA each boast rich histories, and together, we possess nearly 200 years of combined experience—an impressive feat in today's competitive landscape. For 35 years, our joint venture has tackled some of the industry's most challenging motorway projects. The Morava Corridor Motorway Project's program management exemplifies our commitment to excellence, representing a complex endeavor that few can undertake.

The Morava Corridor Motorway Project is a 112 km dual carriageway designed for speeds up to 130 km/h, connecting Pojate and the A1 through Kruševac to Preljina, north of Čačak. Running along the West Morava River valley, it links central Serbia with Pan-European Corridors 10 and 11, facilitating connections to Bosnia, Montenegro, and North Macedonia. By improving the flow of goods and people, it will enhance safety, reduce transportation costs, shorten travel times, boost trade, attract investment, and stimulate economic growth, making it a key driver of regional prosperity.

Our project management team, equipped with extensive expertise in Environment, Safety & Health (ES&H), Engineering, Construction, Quality Assurance and Control, Procurement, Project Controls, Finance, Human Resources, Public Relations, Community Relations, and Sustainability, is dedicated to delivering this vital project of national importance for our Employer, the Government of Serbia.

The 112km motorway is elevated to 4.3m in most sections to prevent flooding. The project encompasses 3,647,448 m^3 of excavation for motorway works, 12,017,032 m^3 for river regulation, and 36,875,058 m^3 from borrow pits. It includes 20,975,470 m^3 of gravel fill, 1,835,026.92 m^3 of subgrade, and 1,240,261.77 m^3 of subbase material. We will lay 1.23 million tonnes of asphalt, construct 37 overpasses, build 78 bridges, and install 236 km of drainage systems with 202 oil separators.

Final touches include 478 km of guardrails, 230 km of wire fencing, 150,000 m^2 of road markings, and 2,450 traffic signs to ensure safety and efficiency. The motorway boosts Serbia's appeal to investors by integrating smart features and a 5G digital corridor for enhanced communication and operational efficiency. Situated on the Morava River's floodplain, it utilizes innovative hydro-technical solutions to manage water flow and reduce flood risks in surrounding areas.

At Bechtel-ENKA, sustainability drives our operations on the Morava Corridor Motorway, and our fleet's efficiency reflects this commitment to reducing our climate footprint. By strategically locating borrow pits and waste areas close to sites, we cut operational cost, minimized equipment travel, and reduced fuel use and greenhouse gas emissions, contributing to climate change mitigation.

From 2020 to 2024, we employed 11,324 individuals from 32 nationalities. Our current workforce exceeds 4,000 employees, comprising 48% Indian nationals, 24% Turkish, and 27% Serbian. To support our diverse workforce, we launched a Mental Health Action Plan to prioritize well-being and safety. Our Human Resources, ES&H, Public Relations, and Camp Management teams collaborate to organize inclusive events that builds community, celebrates diversity, and promotes wellness.

In December 2023, the first three sections of the motorway, totaling 27 km, opened to public traffic ahead of schedule, and we are on track to deliver the next 30 km to our Customer by year-end.

Shawn MacCormack
Bechtel-ENKA Project Director for the Morava Corridor Motorway Project

" The International Road Federation (IRF Global) is a crucial advocate for best practices in global road development, championing excellence and sustainability. The Bechtel-ENKA Morava Corridor Motorway Project views the IRF as an inspiring leader that fosters innovation and knowledge sharing, empowering us to address today's challenges. We are honored to receive the prestigious Program Management Award from IRF, recognizing our commitment to leading industry trends, continuous improvement, and elevating project management standards "

QUALITY MANAGEMENT

PARKING AREAS FOR THE FIFA WORLD CUP QATAR 2022

PUBLIC WORKS AUTHORITY 'ASHGHAL'

The Roads Projects Department (RPD) is a crucial division of Qatar's Public Works Authority (Ashghal) entrusted with executing infrastructure projects in the country. In 2011, a nationwide program was launched encompassing the design and construction of roads and infrastructure networks throughout Qatar. Spearheaded by Ashghal's Road Projects Department (RPD), this initiative aligns with Qatar's National Vision 2030, forming part of the nation's transformation plan. Ahead of the 2022 FIFA World Cup event, RPD was responsible of delivering a plethora of projects serving FIFA stadiums. Among other outputs, RPD has particularly played a pivotal role in the development of parking areas providing a total of more than 6.5 sqm of temporary parking to the stadiums.

To ensure unwavering quality and precision, RPD employed and meticulously implemented a Quality Management System (QMS), encompassing every phase from conceptualization and design to the final utilization stage. This approach underscored RPD's commitment to excellence, resulting in seamless creation of world-class parking facilities that left a lasting impression during the prestigious global sporting event.

Requirements were communicated, and stakeholders remained actively engaged from the initial concept stage to the construction of numerous temporary parking infrastructures to accommodate the vast volume of vehicular parking for the mega event. Emphasizing sustainability and cost-effectiveness, these temporary parking structures were designed to fulfill their purpose while adhering to the overarching goal of Qatar National Strategy (2018-2022) that served as the guiding framework for Ashghal's comprehensive recycling initiative integrated into the implementation of all construction projects.

For the layering of asphalt, RPD devised an innovative pavement design solution. This involved utilizing recycled asphalt pavement (RAP) sourced from previous projects as a substitute for the originally proposed new asphalt Base Course across most of the temporary parking infrastructure. To ensure surface stability and enhance overall riding quality during parking maneuvers, RPD conducted multiple trials incorporating prime coat and tack coat spray applications. The desired outcomes were successfully achieved, resulting in effective surface protection and improved user experience.

The decision to use 100% recycled asphalt pavement (RAP) for the parking areas was highly beneficial in terms of performance, cost-effectiveness, and environmental impact reduction. This was achieved through careful planning, adherence to policies and protocols, and focus on meeting the desired outcomes.

These efforts enabled Ashghal to provide sustainable parking spaces for all eight stadiums without encountering any quality control issues, at a significantly lower cost. Ashghal and RPD take great pride in their contribution to the success of such a monumental event and were keen to share the lessons learned for the use of asphalt pavement recycled materials. The workshops were conducted by international experts and focused on mechanisms and equipment involved in asphalt milling and paving, featuring live demonstrations.

Eng. Salem Al-Marri
Roads Project Department Manager, Public Works Authority 'Ashghal'

" We are very pleased by this win that signifies a big recognition of our efforts in ensuring efficient quality management as "Ashghal" has never ceased to commit to deliver excellence, support sustainable construction practices and has even mandated their implementation across its projects. Winning the IRF Global Road Achievement Award is a testament to our commitment to quality, innovation, safety, and sustainability in infrastructure, as it is a shared responsibility to serve the community, protect the environment inside and outside of Qatar for future generations and benefit from the advantages of these practices in preserving available resources and reducing costs in the long term. It inspires us to continue pushing boundaries and shaping a better future for transportation worldwide. "

RESEARCH

SOLID EARTH INNOVATIVE LIQUID POLYMER TO STABILIZE ROADWAYS, PATHWAYS, AND RECREATIONAL TRACKS

SOLID EARTH INC.

Soil stabilization is a cost-effective method to strengthen low-quality soil for various engineering applications, such as paved surfaces and embankments. While there are many stabilizers available in the construction industry, some lack durability, and others are energy-intensive, contributing to high CO2 emissions.

Solid Earth has developed a proprietary virgin polymer, supported by years of research and field experience, that outperforms other soil stabilizers in durability. It has proven exceptional resilience to extreme weather conditions and provides significant environmental and health benefits with no leaching impact on water or soil.

When mixed with fine aggregates, Solid Earth demonstrates excellent moisture resistance, maintaining its structural integrity even when exposed to prolonged wet conditions. The product is applied through a cost-effective and time-efficient method—simply sprayed and compacted onto loose soil—that requires no specialized equipment. Local teams can carry out the process with Solid Earth's personalized advisory and training services, promoting local economic growth and job creation. Its versatile applications include service roads, bike paths, and more.

Furthermore, **Solid Earth is non-toxic and extends the lifespan of paths and roads by 10 to 20 years without affecting the surrounding environment.**

In collaboration with Arizona State University (ASU), Solid Earth Inc. conducted comprehensive testing to evaluate the performance of SEi. The tests covered strength, durability, resistance to freeze-thaw cycles, moisture damage, wind erosion, and environmental impact.

Measure	Result
Durability	(ASTM D559). Weight loss < 4.9% and good dimensional stability. 3 times better than industry limits.
Strength	(ASTM D2166) 3.5 times more than conventional materials.
Wind Erosion	(Portable In-Situ Wind Erosion Laboratory). Erosion is sustained at 90% and 84% for 12 m/s and 16 m/s, respectively.
Environmental Testing	Minimal impact on groundwater contamination, with tested chemicals remaining within acceptable levels

Utilizing both industry standards and innovative testing protocols, the results confirmed that Solid Earth provides excellent erosion resistance and durability, reducing maintenance costs for long-term infrastructure. It is particularly effective for structural pavement layers and dust control.

Environmental testing further validated that Solid Earth has no negative impact on sublayers or surrounding vegetation, reinforcing its commitment to environmental stewardship. With its combination of superior performance and minimal environmental footprint, Solid Earth stands out as a premier option for soil stabilization and dust control.

Based on ASU's testing, Solid Earth has proven to be a sustainable and efficient solution to modern infrastructure challenges. Solid Earth not only advances roadway construction and maintenance but also aligns with the industry's focus on groundbreaking developments in sustainability and technological innovation.

Hadar Rahav
President, Solid Earth Inc.

" We are humbled and excited to be part of this prestigious IRF Awards program. We appreciate the opportunity to share our technology, driven by our three core passions: performance, well-being, and environmental stewardship. Our purpose is to build strong pathways that connect individuals with their communities, livelihoods, and cultures in harmony with their surroundings. "

SAFETY

JINAN TO WEIFANG EXPRESSWAY PROJECT

SHANDONG HI-SPEED GROUP CO., LTD.

The Jinan to Weifang Expressway is known as the First Zero-Carbon Smart Expressway in China, a major transportation corridor in the country and artery from Jinan to Qingdao. The expressway is 162km long with six lanes in dual directions and has been rated as a key project of new infrastructure in the field of transportation and demonstration Project for Creating Century-Old Quality Projects by the Ministry of Transport of China.

The Expressway prioritizes public travelling safety as its core objective, striving to comprehensively enhance safety assurance for adverse weather conditions, key road sections, key vehicles and tunnel security, as well as the capabilities to efficiently deal with incidents.

1. Adverse Weather and Driving Safety Assurance Technology

In response to problems such as poor visibility and significant safety hazards during rainy nights and adverse weather conditions, technologies for visibility analysis and safety assurance during rainy and foggy weather, friction coefficient analysis and safety assurance during icy and snowy conditions, as well as safety assurance technologies for key points such as merging and diverging areas, have been developed to improve driving safety under adverse conditions. Considering the vehicle-road interaction, the project has also developed a powerful platform with the functions of in-time risk warning, prevention and control. The platform can provide safe driving assistance and early warning for key vehicles such as hazardous materials transport vehicles.

2. Complete Tunnel Safety Assurance Technology

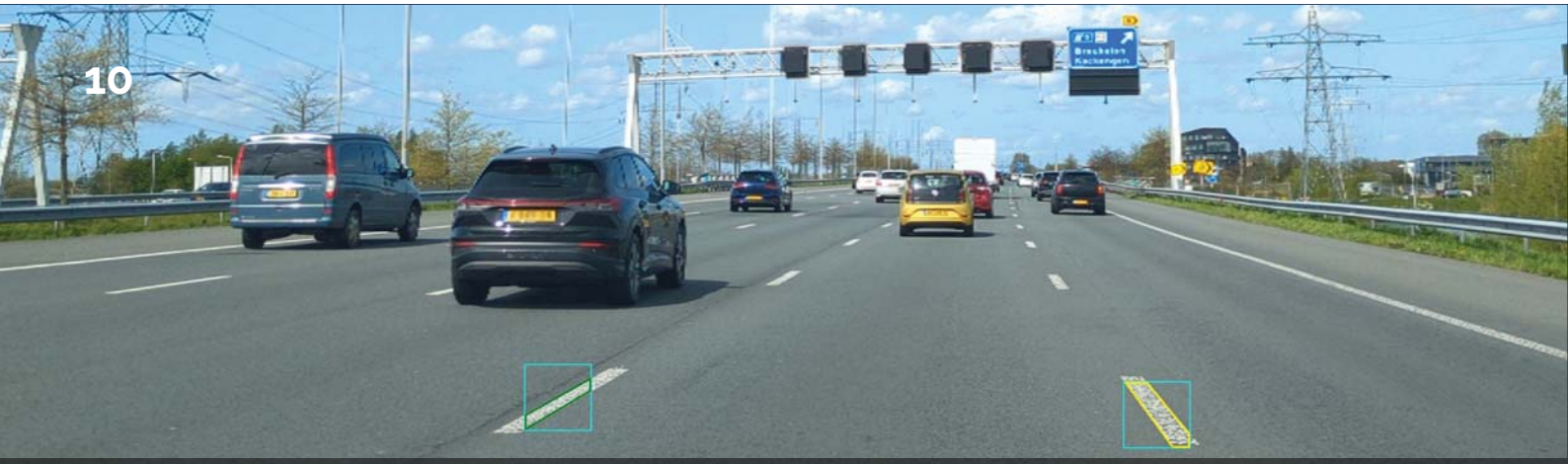
Focusing on the challenges posed by limited tunnel space and difficult accident rescues, innovative technologies have been developed for optimal visual adaptation in tunnel driving, safe and uninterrupted tunnel operations, automated fire safety assurance, full-domain precise perception of the entire tunnel area, and event linkage disposal technology. These advancements provide comprehensive protection for passage safety in tunnels.

3. Precise Event Perception and Emergency Response Technology

To address the problems of high latency in detecting road incidents and low efficiency in emergency response, the project has developed technologies of precise event perception in all weather conditions and event emergency response by multi-party collaborations. It enables incidents to be discovered in seconds and hence improves the incident response efficiency in the "perception-dispatch-disposal" process. The project has also optimized the technology of emergency road rescue service, to update the service level and quality for road rescue. Additionally, the project has innovated in multi-party coordinated event emergency response technology, forming a business management loop of "event-operation monitoring, during-event-command and dispatch, post-event-digital evaluation". Finally, the project has innovated in accompanying travel service information release technology, achieving a precise, personalized, and customized service experience in the whole travelling process.

Wang Qifeng
Chairman, Shandong Hi-Speed Group Co., Ltd.

"Shandong Hi-Speed Group Co., Ltd. is an investment company in the infrastructure sector and also a Fortune Global 500 company. Currently, the group owns 8,745km long highways and has been always adhered to the mission and vision of "to create and share a better path of life" and is committed to providing safer and more convenient travel services. We are honored to receive the GRAA, which is a high recognition for our innovative ideas and practices and we are grateful to IRF Global for selecting our project and providing a stage to fully showcase our construction achievements to the world, further expanding the international influence of the "Shandong Hi-Speed & Pure Excellence" brand, and contributing Chinese strength to the technology progress of the transportation industry."



TECHNOLOGY, EQUIPMENT AND MANUFACTURING

RMAD (ROAD MARKING ASSESSMENT DEVICE)

MIYAGAWA KOGYO CO., LTD.

The Statement of Policy by the International Road Federation in 2014 stated: “Road markings are one of the most cost-effective safety solutions that are available to policy-makers and road owners...” A decade on after the statement, road markings have become increasingly essential for both traffic safety and the development of autonomous driving technologies. However, evaluating road markings with diminished visibility remains a challenge that requires significant time and resources. Consequently, there is an urgent need for technology that addresses the short life cycle of road markings efficiently.

Miyagawa Kogyo Co., Ltd., leveraging over 60 years of expertise in Japan’s road marking industry, recognized this need and initiated the development of the RMAD (Road Marking Assessment Device) in 2016. RMAD was conceived to streamline maintenance cycles through “simple and quantitative” analysis, which is essential for effective infrastructure management. Since 2018, we have collaborated with the National University Corporation, Nagaoka University of Technology, to incorporate advanced AI technologies, thereby enhancing the lifecycle management of road markings.

The RMAD technology has garnered widespread recognition, winning the Infrastructure Maintenance Award in 2021 and the Infrastructure DX Award in 2023. The technology has been featured prominently in Japanese media, including NHK, Japan’s leading public broadcaster, and various newspapers and magazines.

One major strength of RMAD lies in its ability to focus on the wear and presence of road markings, quantifying their condition through evaluation judgments of the presence rate. Another key strength is its ability to display the road marking status on GIS maps with a color-coded ranking system. By leveraging AI and proprietary algorithms, the technology automates the recognition of road markings, calculates their presence rates, classifies them into five distinct ranks, and visualizes this information on electronic maps using GPS data.

These strengths eliminate the need for specialized measuring equipment or skilled technicians, as the necessary information can be collected simply by attaching a phone with a dedicated app to any vehicle. The app’s GPS-based auto-shooting function captures data at set intervals, further streamlining the process. RMAD then automatically calculates and displays the condition of road markings by rank, allowing road administrators to more easily determine whether the road markings meet required standards and plan maintenance accordingly.

Due to these advantages, RMAD can significantly reduce the time and costs associated with road maintenance project planning, making it highly welcomed by both national research institutions and local governments. In Japan, RMAD has been employed in Japan national collaborative research on autonomous driving. Furthermore, their research findings suggests that there is a strong correlation between the presence rate and retro reflectivity.

“The Statement of Policy” continues as follows: “road markings should have a minimum performance of 150 mcd/lux/m^2 and a minimum width of 150 mm for all roads.” With its convenient and reliable data acquisition, along with comprehensive analysis, RMAD is the solution capable of analyzing this issue.

Satoshi Miyagawa
Chief Executive Officer of Miyagawa Kogyo Co., Ltd.

“ We are honored to receive the 2024 IRF Global Road Achievement Award for our innovation in automatic quantification of road marking conditions and visualization on maps. This award underscores our commitment to advancing road infrastructure maintenance through cutting-edge technology. This recognition affirms the dedication our team has invested in developing RMAD, and inspires us to continue pursuing high-impact and sustainable solutions for road infrastructure maintenance in Japan and beyond. ”

MOBILE TRAFFIC MANAGEMENT CENTER (MOBILE TMC)

INTEGRATED TRANSPORT CENTER - ABU DHABI MOBILITY

The Integrated Transport Centre in Abu Dhabi launched the Mobile Traffic Control Centre in November 2023. This state-of-the-art mobile unit is designed to monitor and manage road traffic within the Emirate of Abu Dhabi, leveraging cutting-edge technologies, including artificial intelligence. The centre is crucial for traffic management, particularly during major events, by bringing together decision-makers from various authorities to enhance traffic flow, reduce congestion, and improve safety for both vehicles and pedestrians.

The project integrates advanced technologies such as AI, remote sensing, and geomatics (GIS), managing a network of 645 traffic signals and 1,665 surveillance cameras for real-time monitoring and analysis. The integration adheres to Intelligent Transportation System (ITS) standards, including ISO 14813 for framework architecture and ISO 21217 for ITS station architecture, ensuring compatibility and interoperability of different systems.

The modular and mobile nature of the centre allows for easy replication and deployment in other regions or cities facing similar traffic management challenges. The use of widely available technologies like surveillance cameras and GIS enhances its scalability. ITS communication standards like DSRC (Dedicated Short-Range Communications) and C-V2X (Cellular Vehicle-to-Everything) ensure the system can be adapted to various urban environments.

By reducing congestion and improving traffic flow, the Mobile Traffic Control Centre offers significant cost savings through reduced fuel consumption and travel time. The project optimizes resource allocation via real-time data analysis, making it a cost-effective solution for traffic management. AI's predictive analytics help in proactive traffic control, reducing the need for typically more costly reactive measures.

The project contributes to social and economic benefits by reducing travel times, enhancing road safety, and lowering emissions through decreased congestion. Its sustainable approach aligns with broader environmental goals, promoting a greener urban environment. Utilizing AI-driven traffic management aligns with the UN's Sustainable Development Goals (SDGs) for sustainable cities and communities.

Key events managed by the centre include the F1 Abu Dhabi Grand Prix (23-26 November 2024), UAE National Day Celebration (2 December 2023), and DRIFTX and Abu Dhabi Mobility Week (25 April - 1 May 2024). One crucial aspect is facilitating multi-agency coordination at incident or event sites in one location, making decision-making and response faster and more effective.

The innovative use of existing technologies, such as surveillance cameras and GIS, in a mobile and integrated manner, demonstrates how these tools can be repurposed to meet new challenges in traffic management. The integration of existing standards such as ISO 11073 for health informatics and ISO 19107 for spatial schema in GIS adds value to the project.

The application of AI for real-time traffic analysis and decision-making represents a significant advancement in how traffic data is collected, analyzed, and utilized to improve road conditions. This implementation uses standards like ISO 29182 for sensor networks and ISO 17572 for location referencing to enhance its effectiveness.

While primarily leveraging existing technologies, the project also involves the development of new communication protocols and data analysis algorithms tailored specifically for the needs of a mobile traffic control centre. This development aligns with standards such as ISO 17215 for video communication and ISO 13185 for cooperative ITS.

The project surpasses minimum regulatory requirements by integrating advanced technologies and innovative approaches to traffic management. It sets a new standard for how cities can handle traffic during peak times and special events. Compliance with standards such as ISO 39001 for road traffic safety management systems and ISO 26262 for functional safety in road vehicles underscores its excellence.

Eng. Hamad Bakheet Thabet
Director, Traffic Management Division, ITS Sector, Integrated Transport Center - Abu Dhabi, UAE

" Winning the IRF Global Road Achievement Award for our Mobile Traffic Management Centre is a testament to our commitment to leveraging advanced technologies to enhance road safety and mobility. This recognition reinforces Abu Dhabi's leadership in smart transportation solutions, which are vital to our vision of sustainable and efficient urban mobility. Our collaboration with the International Road Federation has been instrumental in sharing expertise and adopting best practices that drive innovation in road and transport systems globally. "

TRAM/TRAFFIC SMART SAFETY INITIATIVES PROJECT

ROADS AND TRANSPORT AUTHORITY (RTA), DUBAI, UAE

The Roads and Transport Authority (RTA) is responsible for the efficient & sustainable movement of transport in Dubai. A key component of this responsibility is road safety, which directly relates to one of RTA's goals "Safety and Environmental Sustainability". The increasing rate of car ownership and transportation systems needs has been a direct result of a fast-growing economy and increase in population. Dubai Tram's Safe integration into the broader public transportation network is a key focus for RTA. The tram seamlessly & safely connects with other mobility services, including the metro, buses, taxis and cycling lanes, ensuring accessibility to various destinations and aligning with the emirate's vision of promoting sustainable and preferred mobility choices.

In December 2023, it was announced that Dubai Tram has remarkably served approximately 52 million riders since its inauguration in 2014. Over the course of its nine-year journey, the Dubai Tram has safely covered 5.3 million kilometres, connecting 11 stations. It is at grade driver operated people mover that interfaces with the road network at 21 junctions, it has eight minutes headway covering approximately 623,000 km travelled annually.

The Tram Smart Safety Initiatives project reflects RTA's strategy for achieving sustainable development and improving the city's quality of life. RTA reiterates its commitment to adopting the smart technologies in transportation, which enhances the passenger experience in Dubai. The smart initiatives sustain a safe environment around Dubai Tram/road interface to complement the overarching Traffic Safety Strategy and its five-year Action Plan to reach "vision Zero" accidents between the Tram and other road users. This is achieved by using the latest technologies and innovations to launch a Next Best Practice in smart and innovative safety measures like traffic signal LED Backboards, Pedestrian audible alarms and Blank out activated vehicular/pedestrian signs.

Twenty smart initiatives were studied according to a comprehensive evaluation criterion (details below), twelve initiatives were chosen with the top four selected for pilot initiatives at various tram/road intersections as per the following Criterion:

- Compatibility with the existing operations.
- Risks – (Security, Operational, Technology & Failure Risks).
- Licensing Requirements.
- Long Term Maintenance – (Effectiveness, Reach, Impact).
- Life Cycle Cost.
- Other Factors - (Availability, Lead time, Infrastructure readiness).

In 2023, after a six-month evaluation period for the LED Outlined Backboards, it yielded a significant reduction in red-light violations from 948 to 697 (27%). To maintain the successful approach and demonstrate a culture of continuous improvement, the initiative is being rolled out to the remaining tram/road intersections in 2024/2025.

Also, Dubai Tram has witnessed 59% improvements in the Near Misses between the Tram and other road users due to the significant counter-measures stipulated in the Dubai Road Safety Strategy and the Tram/Road Safety Strategy.

The impactful initiatives resulted in developing the journey toward revolutionizing urban mobility and RTA's commitment to sustainable and safe transportation solutions. Replicable initiatives are currently being developed and will go ahead once the site evaluation of the LED Outlined Backboards for the traffic signals take place.

Hussain AL Banna
CEO, Traffic and Roads Agency, RTA

" Winning the IRF Global Road Achievement Award for our Tram Smart Traffic Safety initiatives project is a profound honor and a significant milestone for the Roads and Transport Authority. This prestigious recognition highlights our relentless commitment to advancing urban mobility through cutting-edge technology and innovative traffic safety solutions. Our Tram Smart Traffic Safety initiatives represent a transformative approach to enhancing the efficiency and safety of public transport in Dubai. This award not only validates our efforts but also reinforces our dedication to setting new benchmarks in the global transportation sector. The International Road Federation plays a crucial role in promoting best practices worldwide, providing a platform for sharing groundbreaking advancements and fostering global collaboration. This award underscores our shared vision for a smarter, safer, and more sustainable future in urban transit. "

2025 GRAA Application Information

APPLICATION DEADLINE: MAY 8, 2025

The application package must include:

1. A completed application form
2. A project summary (<500 words)
3. An explanation of how the project meets the criteria of the category in which it has been submitted (~100 words)
4. Microsoft PowerPoint® presentation (.ppt or .pptx) including but not limited to slides, photographs, drawings, diagrams, videos, or additional explanatory materials. (Presentations should be limited to 30 slides or less).
   - If completing a paper application, please compress all your files into a single ZIP archive and send the files via email (if <5MB) or a file-sharing service (if ≥5MB) such as Dropbox, WeTransfer, ShareFile or other like service.
     OR
   - Complete our online application, which includes built in file uploading (https://irf.wufoo.com/forms/2025-graa-application)

Incomplete applications will not be considered. All materials must clearly identify the name of the project, the award category, and contact information of the submitting applicant.

Please note:
The submission of copyrighted material to IRF for the Global Road Achievement Awards shall constitute a general grant of permission to IRF to use the materials for promotional purposes.

Each application package must be accompanied by a non-refundable entry fee of $400 for IRF Member, $875 for non-members. A separate application package (accompanied by payment of the entry fee) must be submitted for each project entered in each category.

Entry packages must be received by the IRF, at the address listed below, by 5:00pm EST on May 8, 2025. Entries must be addressed to:

Global Road Achievement Awards
c/o International Road Federation
500 Montgomery Street.
5th Floor
Alexandria, VA 22314 USA

For further information, please contact:
graa@IRF.global
Tel: +1 703 535 1001

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For further information, please contact: graa@IRF.global | Tel: +1 703 535 1001

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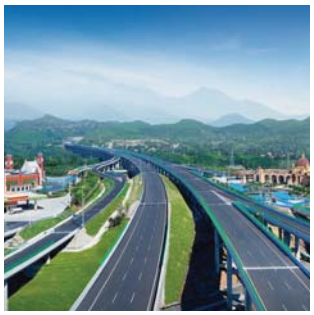
2024 IRF GLOBAL ROAD ACHIEVEMENT AWARDS










www.IRF.global/graa

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MORE THAN AN INDUSTRY ACCOLADE

H.E. Abdullah A. AlMogbel
Chairman Emeritus for Life
International Road Federation

The IRF Global Road Achievement Awards (GRAA) Program was founded to publicize to the world the innovative, practical, creative, cost-saving and sustainable solutions the road industry provides to societies and economies.

Instituted in 2000, the GRAA Program has distinguished more than 260 projects, products and technologies from around the world. Today, the Awards are recognized as a prestigious industry accolade in their own right, but they also serve to remind a much wider audience that the mobility everyone takes for granted would not be possible without the talent and commitment of our industry. Lastly, the IRF Awards are an accelerator of progress and ideas: by showcasing our achievements, we are able to learn from each other, and build on our successes.

On behalf of IRF Global and our international panel of independent judges, I would like to congratulate the winners of the 2024 IRF Global Road Achievement Awards. They are an asset to an industry that is constantly investing in new solutions to deliver gains and sustainability advances that benefit everyone.

The diversity and quality of this year's winning projects are also a great testament to IRF Global's status as the international marketplace for best practices and industry solutions.

I invite you to examine them in detail and to submit your own exemplary projects to the 2025 GRAA Competition.

ASSET PRESERVATION AND MAINTENANCE MANAGEMENT

SOUTHERN CROSS-ISLAND HIGHWAY-A DECADE OF EFFORTS IN MAINTENANCE, REHABILITATION, AND RECONSTRUCTION

HIGHWAY BUREAU, MOTC, TAIWAN

The Southern Cross-Island Highway, a vital 204-kilometer route traversing Taiwan's Central Mountain Range, was severely damaged by Typhoon Morakot in 2009. This document details the extensive reconstruction efforts undertaken over a decade to restore functionality and ensure the highway's long-term sustainability.

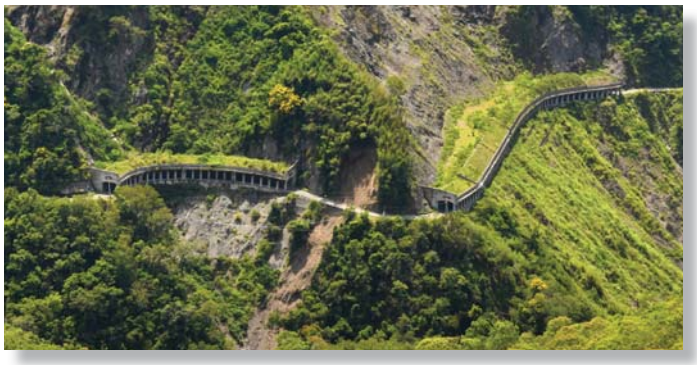
Devastation and Response:

Typhoon Morakot's record-breaking rainfall caused catastrophic damage, including:

- Roadbed loss and subbase depression
- Bridge collapses and embankment failures
- Riverbed elevation and widespread landslides

The Highway Bureau implemented a three-phased strategic reconstruction program:

- **Short-term (2009-2017):** Emergency repairs to maintain minimal traffic flow, focusing on stabilizing the most critical sections.
- **Mid-term (2017-2022):** Structural reinforcement projects to improve traffic capacity and prevent future disasters. This involved securing embankments, preventing rockfalls, and restoring vegetation.
- **Long-term (2022-present):** Disaster-resilient reconstruction in severely affected areas, including building new bridges and open-cut tunnels.



Recovery and Innovation:

By 2022, the Southern Cross-Island Highway was fully reopened to traffic. The project's success can be attributed to several factors:

- **Strategic reconstruction plan:** The phased approach allowed for efficient resource allocation and targeted interventions.
- **Advanced technologies:** Lidar, UAVs, and InSAR were used to assess damage, monitor progress, and inform reconstruction strategies.
- **Emergency preparedness:** Optimizing emergency response times and deploying real-time monitoring systems improved safety and incident management.
- Sustainable practices: The project prioritized ecological balance by restoring vegetation, implementing rest days for ecosystem recovery, and employing local indigenous people as highway patrols and gatekeepers.

Outcomes and Impacts:

The reconstruction project achieved significant results:

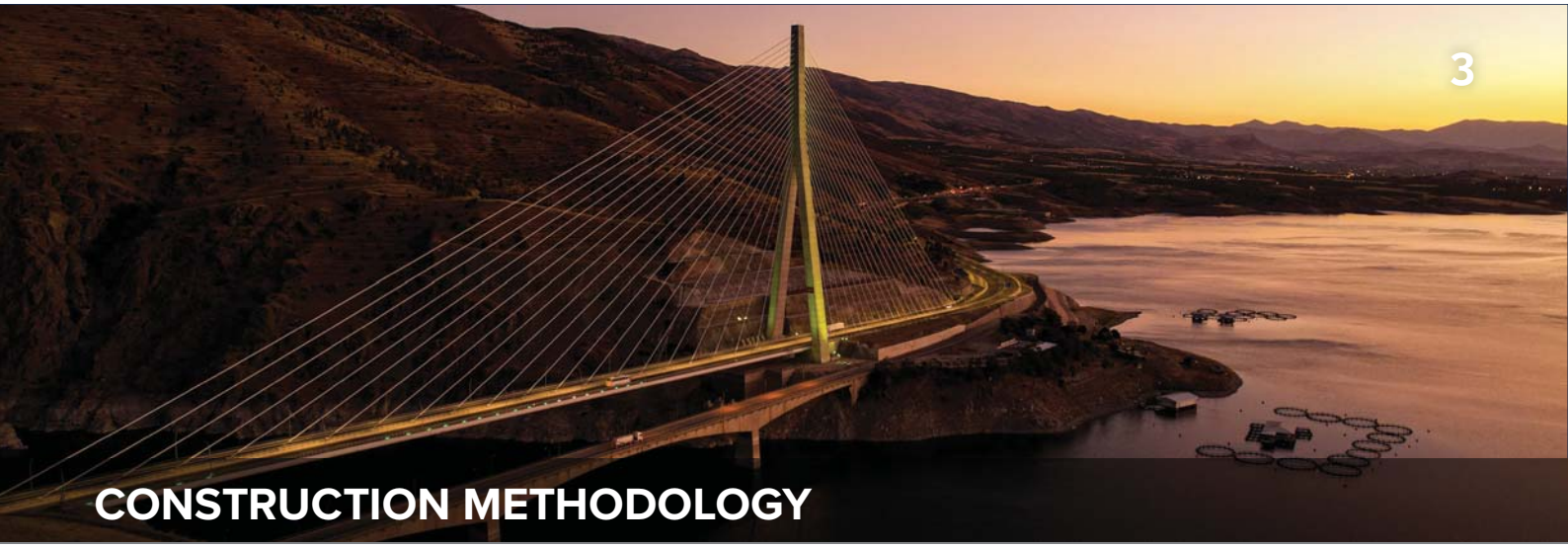
- Infrastructure restoration: Over 78 kilometers of roadbed, 15 open-cut tunnels, and 24 bridges were rebuilt.
- Enhanced communication: 5G network coverage and power systems were strengthened, ensuring connectivity and reliability.
- Improved safety: Measures like automatic vehicle plate monitoring and routine emergency drills enhanced safety for motorists and residents.
- Economic revitalization: Reopening the highway revitalized tourism and facilitated economic activity in the region.
- Community engagement: Local communities were actively involved in reconstruction and environmental protection efforts.

Looking Ahead:

The Southern Cross-Island Highway's successful reconstruction serves as a testament to the Highway Bureau's commitment to resilience and sustainability. Ongoing maintenance and rehabilitation strategies, combined with continuous monitoring and emergency preparedness, will ensure the highway's long-term functionality and safety, while preserving the delicate ecosystem of the Central Mountain Range.

Wen-Rui Chen
Director General of the Highway Bureau (MOTC)

" The strategic three-phase approach prioritizing sustainability, ecological balance, and community well-being is exemplified by the prestigious IRF award and recognized for a decade of effort. "



CONSTRUCTION METHODOLOGY

KÖMÜRHAN BRIDGE

MINISTRY OF TRANSPORT AND INFRASTRUCTURE, REPUBLIC OF TÜRKİYE

Elazığ province, which has a history of more than 4 thousand years and which is established at the foot of Harput, is named as the 'Holy city' thanks to its air, water, soil and people. The city is surrounded by Keban and Karakaya Dams, which are located within the large arch drawn by Euphrates River.

This bridge, which is constructed right next to Kömürhan Bridge that was constructed on the Euphrates River in 1980s, constitutes an important section of the road (5.155 km), which is constructed with high standards thanks to its tunnels, at-grade intersections and bridge crossings.

Main span of Kömürhan Bridge, which is constructed by Doğuş-Gülsan Joint Venture, is 380 meters, and the cross section of a very large part of the aforementioned span consists of an orthotropic steel deck. Total length of the bridge is 660 meters, including 100 meters of posttensioned concrete approach slab, which is connected to the tunnel from Elazığ direction, and an anchorage block of 180 meters coming from the direction of Malatya.

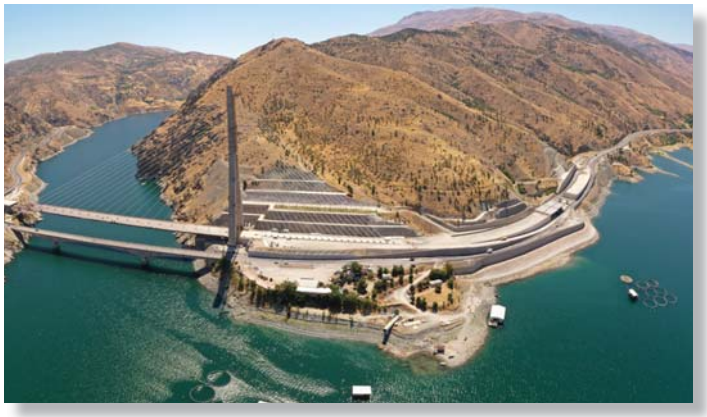
The width of the structure is 25 meters at main span, and it included a 2x2 traffic lane. The approach slab of 100 meters has a posttensioned box-type cross section, and its width reaches to 30.60 meters when it is being connected to tunnels. Transverse posttensioning is also used on the posttensioned concrete.

Kömürhan Bridge is the first and only single-pylon cable-stayed of our country, and it is listed among top four bridges that show such characteristic globally. On the bridge, 2x1 cables are organized in the middle of the deck and in a way to be located on a single plane. Deck is embedded in the pylon. Cables are comprised of 7-Wire low-relaxation 15.7 mm strands (tensile strength: 1860/670 MPA) Amount of strands used in cables:

Amount of S355J2+N steel that is used to build Kömürhan Bridge is 7000 tons, and it is equal to the amount of steel used to build Eiffel Tower. Length of the weld seam, which is used in transverse and longitudinal assembly of segments, is approximately 450.000 meters. The length of strands, which are used in cables that connect steel segments to the tower, is 853.000 meters.

Pylon bolt, total height of which is 168.5 meters, is in the shape of a reversed Y, and it is comprised of a reinforced concrete box girder. Individual steel cores are created in areas where anchorages of cables are present in the pylon. The pylon is placed on the ground through 46.5x16.0x7.0 meters headstall sitting on 2 reinforced concrete caissons of 15 meters in diameter and 22.5 meters in depth, which are arranged under beam level.

Kömürhan Bridge and Tunnel, which is opened to traffic on 02.01.2021, is located in a strategic location on roads that connect East Anatolia Region and Southeastern Anatolia Region to each other, as well as Central Anatolia Region and Mediterranean Region.



Abdulkadir URALOĞLU
Minister of Transport and Infrastructure of the Republic of Türkiye

"We are very honored to be awarded the Construction Methodology award by GRAA, which is highly respected around the world. Winning awards is of great importance for our country as it confirms our relentless efforts and outstanding performance. This recognition, which is a testament to teamwork, innovation and the pursuit of excellence, encourages us to outdo ourselves and achieve even greater success in the future. "

DESIGN

KINMEN BAY BRIDGE PROJECT

FREEWAY BUREAU, MOTC, TAIWAN

The Kinmen Bay Bridge, completed in October 2022, stands as a testament to innovative engineering and collaborative effort. This 4,770- meter-long bridge connects Kinmen and Lieyu Islet, previously solely reliant on ferry services often hampered by seasonal fog and challenging weather. The bridge not only provides a reliable transportation link but also boasts a unique aesthetic design that reflects the local culture and landscape.

Overcoming Challenges through Innovative Design:

The construction of the Kinmen Bay Bridge faced numerous challenges, demanding ingenious solutions and meticulous planning.

• **Complex Geology:** The bedrock, consisting of weathered granite with varying depths and conditions, required the use of reinforced concrete piles and additional drilling tasks to ensure stability. The team employed real-time drilling adjustments and specialized techniques to overcome the complexities of the granite basin.

• **Steep Basin and Strong Tidal Surge:** To counteract the challenges posed by the deep basin and strong tidal currents, the bridge design incorporated anti-scouring protection works, braced cofferdams, and structural reinforcement to withstand breaking waves and high tidal surges.

• **Extreme Seasonal Weather Conditions:** The bridge's design and construction addressed the region's extreme weather, including typhoons and dense fog. This involved increasing the concrete's protective cover, utilizing hot-dip galvanized steel bars, implementing a multi-protection cable system, and installing a comprehensive bridge monitoring system for long-term performance evaluation.

• **Tight Schedule and Long Shipping Distance:** Efficient logistics planning was crucial due to the distance between Kinmen and mainland Taiwan, where many construction materials and precast box girders originated. A well-coordinated schedule ensured the timely delivery of materials and personnel, employing both sea and air transport as needed.

• **Offshore Construction Safety:** A comprehensive safety plan was implemented throughout the design and construction phases, with routine checks and risk assessments. Specific measures included monitoring the trestle bridge's integrity, establishing a marine traffic control team, and adhering to strict safety protocols on the floating platform.

A Scenic Bridge Reflecting Local Culture:

The bridge's design is not only functional but also aesthetically pleasing, reflecting the local culture and preferences. The "Sorghum-Shape" pylons, chosen through a public vote, harmonize with the surrounding landscape and offer a unique visual identity. Nighttime lighting further enhances the bridge's beauty and ensures safety for navigation.

Significance and Impact:

The Kinmen Bay Bridge has significantly improved connectivity and quality of life for the residents of Kinmen and Lieyu Islet. It provides a reliable transportation link, facilitates access to essential services, and promotes tourism. The bridge's resilience ensures its continued functionality even during challenging weather conditions, contributing to the region's economic development and social well-being.

Conclusion:

The Kinmen Bay Bridge serves as a shining example of successful bridge design and construction, overcoming numerous challenges through innovative solutions and a commitment to safety and aesthetics. It stands as a symbol of connection, resilience, and progress for the Kinmen region.

Yi-Fang Shih & Shing-Hau Jaw
Chairman, CECI & Director General of the Freeway Bureau (MOTC), Taiwan

" The Kinmen Bay Bridge project provides a vital, resilient, and scenic connection between Kinmen and Lieyu, significantly enhancing mobility and emergency services. The IRF GRAA fuels our continued pursuit of excellence for both organizations. "

ENVIRONMENTAL MITIGATION

HUIZHOU-QINGYUAN SECTION OF SHANTOU-ZHANJIANG EXPRESSWAY

GUANGDONG HIGHWAY, BRIDGE AND EXPRESSWAY CO., LTD.

The Huizhou-Qingyuan section of the Shantou-Zhanjiang Expressway (referred to as the "Huizhou-Qingyuan Expressway") is located in the central region of Guangdong Province, spanning the three cities of Huizhou, Guangzhou and Qingyuan, with a total length of 125.28 kilometers. It was completed and opened to traffic in October 2020. Since then, the driving time between Huizhou and Qingyuan was shortened from the original 3 hours to 1.5 hours, benefiting about 28 million local people. The Huizhou-Qingyuan Expressway passes through many national, provincial, municipal and county-level ecologically sensitive areas. The ecology along the route is beautiful, there are many scenic spots, and there are over 60 tourist attractions. Protecting the environment and implementing green construction are key difficulties of the project.

During the construction process, the project team of Huizhou-Qingyuan Expressway strictly implemented the philosophy of "technology driven, ecologically coordinated, constructed green, and intelligently managed", carried out 14 research programs, 35 green technology applications and 104 micro-innovations etc., summarized and formed 52 green highway construction systems, successfully overcame the difficulties of green highway construction and intelligent management of construction in ecologically sensitive areas, and created a "Huizhou-Qingyuan paradigm" for green highway construction.

The project team of Huizhou-Qingyuan Expressway has incorporated the "green gene" into the entire construction process, and successfully applied technologies such as ecological line selection, "permanent and temporary combination", tree transplantation, high-standard farmland embankment slope reduction, topsoil protection and utilization, and tunnel slag comprehensive utilization. A total of 10 ecologically sensitive areas were avoided, 20 "permanent and temporary combinations" of electricity use were achieved, and more than 2,000 precious trees were transplanted; 1.03 million cubic meters of topsoil were recycled and utilized, achieving a recycling rate of 100%; over 4 million cubic meters of tunnel slag along the entire line were recycled and utilized, effectively reducing the area of tunnel slag stacking site by nearly 700 mu, and achieving high economic and social benefits.

With fruitful results in green construction, the Huizhou-Qingyuan Expressway has been successively rated as a national soil and water conservation demonstration project of the Ministry of Water Resources, a demonstration green highway of the Ministry of Transport, a pilot project for science and technology demonstration and quality control, an excellent pilot project for a country with strong transportation network, and one of the "Top Ten Socially Responsible Projects of State-owned Enterprises in the Guangdong-Hong Kong-Macao Greater Bay Area (Ecological Civilization)".

Lv Dawei

Deputy General Manager, Guangdong Highway, Bridge and Expressway Co., Ltd.

"Lucid waters and lush mountains are invaluable assets. The project team of Huizhou-Qingyuan Expressway proposed the concept of green expressway construction at the initiation stage. During the construction process, a large number of green construction processes were applied. It has achieved great economic and environmental benefits. This time, we won the Global Road Achievement Award (GRAA) of IRF Global in recognition of our environmental protection efforts, we feel very honored and proud. We will continue to make more efforts in green construction and environmental protection and make greater contributions to the transportation industry and global sustainable development."

PROGRAM MANAGEMENT

MORAVA CORRIDOR MOTORWAY PROJECT

BECHTEL - ENKA

Bechtel and ENKA each boast rich histories, and together, we possess nearly 200 years of combined experience—an impressive feat in today's competitive landscape. For 35 years, our joint venture has tackled some of the industry's most challenging motorway projects. The Morava Corridor Motorway Project's program management exemplifies our commitment to excellence, representing a complex endeavor that few can undertake.

The Morava Corridor Motorway Project is a 112 km dual carriageway designed for speeds up to 130 km/h, connecting Pojate and the A1 through Kruševac to Preljina, north of Čačak. Running along the West Morava River valley, it links central Serbia with Pan-European Corridors 10 and 11, facilitating connections to Bosnia, Montenegro, and North Macedonia. By improving the flow of goods and people, it will enhance safety, reduce transportation costs, shorten travel times, boost trade, attract investment, and stimulate economic growth, making it a key driver of regional prosperity.

Our project management team, equipped with extensive expertise in Environment, Safety & Health (ES&H), Engineering, Construction, Quality Assurance and Control, Procurement, Project Controls, Finance, Human Resources, Public Relations, Community Relations, and Sustainability, is dedicated to delivering this vital project of national importance for our Employer, the Government of Serbia.

The 112km motorway is elevated to 4.3m in most sections to prevent flooding. The project encompasses 3,647,448 m^3 of excavation for motorway works, 12,017,032 m^3 for river regulation, and 36,875,058 m^3 from borrow pits. It includes 20,975,470 m^3 of gravel fill, 1,835,026.92 m^3 of subgrade, and 1,240,261.77 m^3 of subbase material. We will lay 1.23 million tonnes of asphalt, construct 37 overpasses, build 78 bridges, and install 236 km of drainage systems with 202 oil separators.

Final touches include 478 km of guardrails, 230 km of wire fencing, 150,000 m^2 of road markings, and 2,450 traffic signs to ensure safety and efficiency. The motorway boosts Serbia's appeal to investors by integrating smart features and a 5G digital corridor for enhanced communication and operational efficiency. Situated on the Morava River's floodplain, it utilizes innovative hydro-technical solutions to manage water flow and reduce flood risks in surrounding areas.

At Bechtel-ENKA, sustainability drives our operations on the Morava Corridor Motorway, and our fleet's efficiency reflects this commitment to reducing our climate footprint. By strategically locating borrow pits and waste areas close to sites, we cut operational cost, minimized equipment travel, and reduced fuel use and greenhouse gas emissions, contributing to climate change mitigation.

From 2020 to 2024, we employed 11,324 individuals from 32 nationalities. Our current workforce exceeds 4,000 employees, comprising 48% Indian nationals, 24% Turkish, and 27% Serbian. To support our diverse workforce, we launched a Mental Health Action Plan to prioritize well-being and safety. Our Human Resources, ES&H, Public Relations, and Camp Management teams collaborate to organize inclusive events that builds community, celebrates diversity, and promotes wellness.

In December 2023, the first three sections of the motorway, totaling 27 km, opened to public traffic ahead of schedule, and we are on track to deliver the next 30 km to our Customer by year-end.

Shawn MacCormack
Bechtel-ENKA Project Director for the Morava Corridor Motorway Project

" The International Road Federation (IRF Global) is a crucial advocate for best practices in global road development, championing excellence and sustainability. The Bechtel-ENKA Morava Corridor Motorway Project views the IRF as an inspiring leader that fosters innovation and knowledge sharing, empowering us to address today's challenges. We are honored to receive the prestigious Program Management Award from IRF, recognizing our commitment to leading industry trends, continuous improvement, and elevating project management standards "

QUALITY MANAGEMENT

PARKING AREAS FOR THE FIFA WORLD CUP QATAR 2022

PUBLIC WORKS AUTHORITY 'ASHGHAL'

The Roads Projects Department (RPD) is a crucial division of Qatar's Public Works Authority (Ashghal) entrusted with executing infrastructure projects in the country. In 2011, a nationwide program was launched encompassing the design and construction of roads and infrastructure networks throughout Qatar. Spearheaded by Ashghal's Road Projects Department (RPD), this initiative aligns with Qatar's National Vision 2030, forming part of the nation's transformation plan. Ahead of the 2022 FIFA World Cup event, RPD was responsible of delivering a plethora of projects serving FIFA stadiums. Among other outputs, RPD has particularly played a pivotal role in the development of parking areas providing a total of more than 6.5 sqm of temporary parking to the stadiums.

To ensure unwavering quality and precision, RPD employed and meticulously implemented a Quality Management System (QMS), encompassing every phase from conceptualization and design to the final utilization stage. This approach underscored RPD's commitment to excellence, resulting in seamless creation of world-class parking facilities that left a lasting impression during the prestigious global sporting event.

Requirements were communicated, and stakeholders remained actively engaged from the initial concept stage to the construction of numerous temporary parking infrastructures to accommodate the vast volume of vehicular parking for the mega event. Emphasizing sustainability and cost-effectiveness, these temporary parking structures were designed to fulfill their purpose while adhering to the overarching goal of Qatar National Strategy (2018-2022) that served as the guiding framework for Ashghal's comprehensive recycling initiative integrated into the implementation of all construction projects.

For the layering of asphalt, RPD devised an innovative pavement design solution. This involved utilizing recycled asphalt pavement (RAP) sourced from previous projects as a substitute for the originally proposed new asphalt Base Course across most of the temporary parking infrastructure. To ensure surface stability and enhance overall riding quality during parking maneuvers, RPD conducted multiple trials incorporating prime coat and tack coat spray applications. The desired outcomes were successfully achieved, resulting in effective surface protection and improved user experience.

The decision to use 100% recycled asphalt pavement (RAP) for the parking areas was highly beneficial in terms of performance, cost-effectiveness, and environmental impact reduction. This was achieved through careful planning, adherence to policies and protocols, and focus on meeting the desired outcomes.

These efforts enabled Ashghal to provide sustainable parking spaces for all eight stadiums without encountering any quality control issues, at a significantly lower cost. Ashghal and RPD take great pride in their contribution to the success of such a monumental event and were keen to share the lessons learned for the use of asphalt pavement recycled materials. The workshops were conducted by international experts and focused on mechanisms and equipment involved in asphalt milling and paving, featuring live demonstrations.

Eng. Salem Al-Marri
Roads Project Department Manager, Public Works Authority 'Ashghal'

" We are very pleased by this win that signifies a big recognition of our efforts in ensuring efficient quality management as "Ashghal" has never ceased to commit to deliver excellence, support sustainable construction practices and has even mandated their implementation across its projects. Winning the IRF Global Road Achievement Award is a testament to our commitment to quality, innovation, safety, and sustainability in infrastructure, as it is a shared responsibility to serve the community, protect the environment inside and outside of Qatar for future generations and benefit from the advantages of these practices in preserving available resources and reducing costs in the long term. It inspires us to continue pushing boundaries and shaping a better future for transportation worldwide. "

RESEARCH

SOLID EARTH INNOVATIVE LIQUID POLYMER TO STABILIZE ROADWAYS, PATHWAYS, AND RECREATIONAL TRACKS

SOLID EARTH INC.

Soil stabilization is a cost-effective method to strengthen low-quality soil for various engineering applications, such as paved surfaces and embankments. While there are many stabilizers available in the construction industry, some lack durability, and others are energy-intensive, contributing to high CO2 emissions.

Solid Earth has developed a proprietary virgin polymer, supported by years of research and field experience, that outperforms other soil stabilizers in durability. It has proven exceptional resilience to extreme weather conditions and provides significant environmental and health benefits with no leaching impact on water or soil.

When mixed with fine aggregates, Solid Earth demonstrates excellent moisture resistance, maintaining its structural integrity even when exposed to prolonged wet conditions. The product is applied through a cost-effective and time-efficient method—simply sprayed and compacted onto loose soil—that requires no specialized equipment. Local teams can carry out the process with Solid Earth's personalized advisory and training services, promoting local economic growth and job creation. Its versatile applications include service roads, bike paths, and more.

Furthermore, **Solid Earth is non-toxic and extends the lifespan of paths and roads by 10 to 20 years without affecting the surrounding environment.**

In collaboration with Arizona State University (ASU), Solid Earth Inc. conducted comprehensive testing to evaluate the performance of SEi. The tests covered strength, durability, resistance to freeze-thaw cycles, moisture damage, wind erosion, and environmental impact.

Measure	Result
Durability	(ASTM D559). Weight loss < 4.9% and good dimensional stability. 3 times better than industry limits.
Strength	(ASTM D2166) 3.5 times more than conventional materials.
Wind Erosion	(Portable In-Situ Wind Erosion Laboratory). Erosion is sustained at 90% and 84% for 12 m/s and 16 m/s, respectively.
Environmental Testing	Minimal impact on groundwater contamination, with tested chemicals remaining within acceptable levels

Utilizing both industry standards and innovative testing protocols, the results confirmed that Solid Earth provides excellent erosion resistance and durability, reducing maintenance costs for long-term infrastructure. It is particularly effective for structural pavement layers and dust control.

Environmental testing further validated that Solid Earth has no negative impact on sublayers or surrounding vegetation, reinforcing its commitment to environmental stewardship. With its combination of superior performance and minimal environmental footprint, Solid Earth stands out as a premier option for soil stabilization and dust control.

Based on ASU's testing, Solid Earth has proven to be a sustainable and efficient solution to modern infrastructure challenges. Solid Earth not only advances roadway construction and maintenance but also aligns with the industry's focus on groundbreaking developments in sustainability and technological innovation.

Hadar Rahav
President, Solid Earth Inc.

" We are humbled and excited to be part of this prestigious IRF Awards program. We appreciate the opportunity to share our technology, driven by our three core passions: performance, well-being, and environmental stewardship. Our purpose is to build strong pathways that connect individuals with their communities, livelihoods, and cultures in harmony with their surroundings. "

SAFETY

JINAN TO WEIFANG EXPRESSWAY PROJECT

SHANDONG HI-SPEED GROUP CO., LTD.

The Jinan to Weifang Expressway is known as the First Zero-Carbon Smart Expressway in China, a major transportation corridor in the country and artery from Jinan to Qingdao. The expressway is 162km long with six lanes in dual directions and has been rated as a key project of new infrastructure in the field of transportation and demonstration Project for Creating Century-Old Quality Projects by the Ministry of Transport of China.

The Expressway prioritizes public travelling safety as its core objective, striving to comprehensively enhance safety assurance for adverse weather conditions, key road sections, key vehicles and tunnel security, as well as the capabilities to efficiently deal with incidents.

1. Adverse Weather and Driving Safety Assurance Technology

In response to problems such as poor visibility and significant safety hazards during rainy nights and adverse weather conditions, technologies for visibility analysis and safety assurance during rainy and foggy weather, friction coefficient analysis and safety assurance during icy and snowy conditions, as well as safety assurance technologies for key points such as merging and diverging areas, have been developed to improve driving safety under adverse conditions. Considering the vehicle-road interaction, the project has also developed a powerful platform with the functions of in-time risk warning, prevention and control. The platform can provide safe driving assistance and early warning for key vehicles such as hazardous materials transport vehicles.

2. Complete Tunnel Safety Assurance Technology

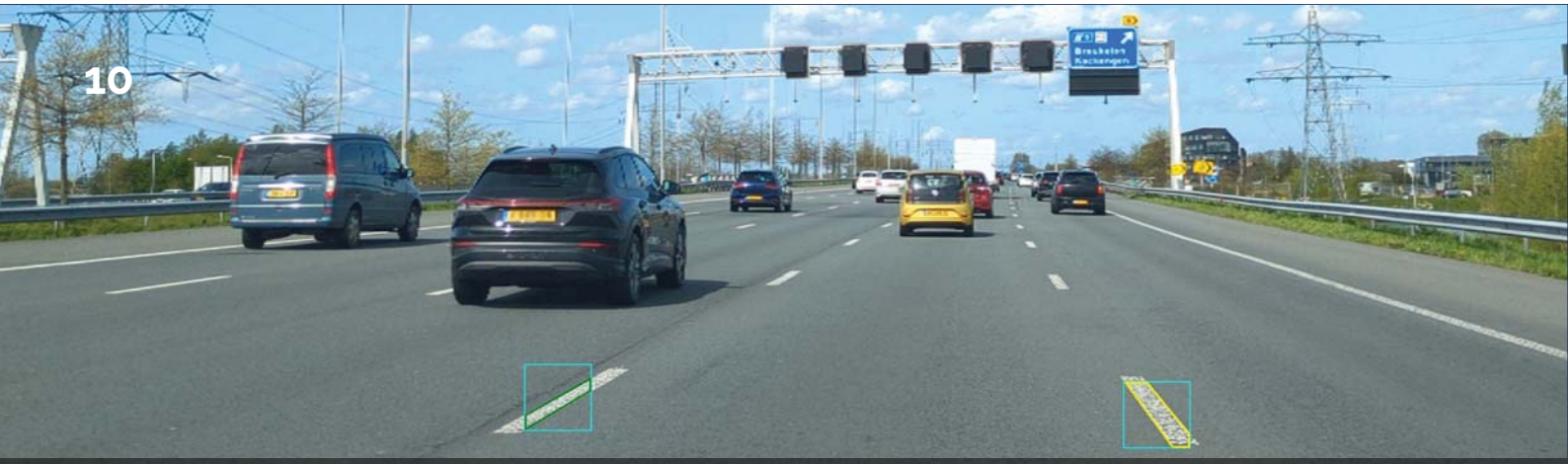
Focusing on the challenges posed by limited tunnel space and difficult accident rescues, innovative technologies have been developed for optimal visual adaptation in tunnel driving, safe and uninterrupted tunnel operations, automated fire safety assurance, full-domain precise perception of the entire tunnel area, and event linkage disposal technology. These advancements provide comprehensive protection for passage safety in tunnels.

3. Precise Event Perception and Emergency Response Technology

To address the problems of high latency in detecting road incidents and low efficiency in emergency response, the project has developed technologies of precise event perception in all weather conditions and event emergency response by multi-party collaborations. It enables incidents to be discovered in seconds and hence improves the incident response efficiency in the "perception-dispatch-disposal" process. The project has also optimized the technology of emergency road rescue service, to update the service level and quality for road rescue. Additionally, the project has innovated in multi-party coordinated event emergency response technology, forming a business management loop of "event-operation monitoring, during-event-command and dispatch, post-event-digital evaluation". Finally, the project has innovated in accompanying travel service information release technology, achieving a precise, personalized, and customized service experience in the whole travelling process.

Wang Qifeng
Chairman, Shandong Hi-Speed Group Co., Ltd.

"Shandong Hi-Speed Group Co., Ltd. is an investment company in the infrastructure sector and also a Fortune Global 500 company. Currently, the group owns 8,745km long highways and has been always adhered to the mission and vision of "to create and share a better path of life" and is committed to providing safer and more convenient travel services. We are honored to receive the GRAA, which is a high recognition for our innovative ideas and practices and we are grateful to IRF Global for selecting our project and providing a stage to fully showcase our construction achievements to the world, further expanding the international influence of the "Shandong Hi-Speed & Pure Excellence" brand, and contributing Chinese strength to the technology progress of the transportation industry."



TECHNOLOGY, EQUIPMENT AND MANUFACTURING

RMAD (ROAD MARKING ASSESSMENT DEVICE)

MIYAGAWA KOGYO CO., LTD.

The Statement of Policy by the International Road Federation in 2014 stated: “Road markings are one of the most cost-effective safety solutions that are available to policy-makers and road owners...” A decade on after the statement, road markings have become increasingly essential for both traffic safety and the development of autonomous driving technologies. However, evaluating road markings with diminished visibility remains a challenge that requires significant time and resources. Consequently, there is an urgent need for technology that addresses the short life cycle of road markings efficiently.

Miyagawa Kogyo Co., Ltd., leveraging over 60 years of expertise in Japan’s road marking industry, recognized this need and initiated the development of the RMAD (Road Marking Assessment Device) in 2016. RMAD was conceived to streamline maintenance cycles through “simple and quantitative” analysis, which is essential for effective infrastructure management. Since 2018, we have collaborated with the National University Corporation, Nagaoka University of Technology, to incorporate advanced AI technologies, thereby enhancing the lifecycle management of road markings.

The RMAD technology has garnered widespread recognition, winning the Infrastructure Maintenance Award in 2021 and the Infrastructure DX Award in 2023. The technology has been featured prominently in Japanese media, including NHK, Japan’s leading public broadcaster, and various newspapers and magazines.

One major strength of RMAD lies in its ability to focus on the wear and presence of road markings, quantifying their condition through evaluation judgments of the presence rate. Another key strength is its ability to display the road marking status on GIS maps with a color-coded ranking system. By leveraging AI and proprietary algorithms, the technology automates the recognition of road markings, calculates their presence rates, classifies them into five distinct ranks, and visualizes this information on electronic maps using GPS data.

These strengths eliminate the need for specialized measuring equipment or skilled technicians, as the necessary information can be collected simply by attaching a phone with a dedicated app to any vehicle. The app’s GPS-based auto-shooting function captures data at set intervals, further streamlining the process. RMAD then automatically calculates and displays the condition of road markings by rank, allowing road administrators to more easily determine whether the road markings meet required standards and plan maintenance accordingly.

Due to these advantages, RMAD can significantly reduce the time and costs associated with road maintenance project planning, making it highly welcomed by both national research institutions and local governments. In Japan, RMAD has been employed in Japan national collaborative research on autonomous driving. Furthermore, their research findings suggests that there is a strong correlation between the presence rate and retro reflectivity.

“The Statement of Policy” continues as follows: “road markings should have a minimum performance of 150 mcd/lux/m^2 and a minimum width of 150 mm for all roads.” With its convenient and reliable data acquisition, along with comprehensive analysis, RMAD is the solution capable of analyzing this issue.

Satoshi Miyagawa
Chief Executive Officer of Miyagawa Kogyo Co., Ltd.

“ We are honored to receive the 2024 IRF Global Road Achievement Award for our innovation in automatic quantification of road marking conditions and visualization on maps. This award underscores our commitment to advancing road infrastructure maintenance through cutting-edge technology. This recognition affirms the dedication our team has invested in developing RMAD, and inspires us to continue pursuing high-impact and sustainable solutions for road infrastructure maintenance in Japan and beyond. ”

MOBILE TRAFFIC MANAGEMENT CENTER (MOBILE TMC)

INTEGRATED TRANSPORT CENTER - ABU DHABI MOBILITY

The Integrated Transport Centre in Abu Dhabi launched the Mobile Traffic Control Centre in November 2023. This state-of-the-art mobile unit is designed to monitor and manage road traffic within the Emirate of Abu Dhabi, leveraging cutting-edge technologies, including artificial intelligence. The centre is crucial for traffic management, particularly during major events, by bringing together decision-makers from various authorities to enhance traffic flow, reduce congestion, and improve safety for both vehicles and pedestrians.

The project integrates advanced technologies such as AI, remote sensing, and geomatics (GIS), managing a network of 645 traffic signals and 1,665 surveillance cameras for real-time monitoring and analysis. The integration adheres to Intelligent Transportation System (ITS) standards, including ISO 14813 for framework architecture and ISO 21217 for ITS station architecture, ensuring compatibility and interoperability of different systems.

The modular and mobile nature of the centre allows for easy replication and deployment in other regions or cities facing similar traffic management challenges. The use of widely available technologies like surveillance cameras and GIS enhances its scalability. ITS communication standards like DSRC (Dedicated Short-Range Communications) and C-V2X (Cellular Vehicle-to-Everything) ensure the system can be adapted to various urban environments.

By reducing congestion and improving traffic flow, the Mobile Traffic Control Centre offers significant cost savings through reduced fuel consumption and travel time. The project optimizes resource allocation via real-time data analysis, making it a cost-effective solution for traffic management. AI's predictive analytics help in proactive traffic control, reducing the need for typically more costly reactive measures.

The project contributes to social and economic benefits by reducing travel times, enhancing road safety, and lowering emissions through decreased congestion. Its sustainable approach aligns with broader environmental goals, promoting a greener urban environment. Utilizing AI-driven traffic management aligns with the UN's Sustainable Development Goals (SDGs) for sustainable cities and communities.

Key events managed by the centre include the F1 Abu Dhabi Grand Prix (23-26 November 2024), UAE National Day Celebration (2 December 2023), and DRIFTX and Abu Dhabi Mobility Week (25 April - 1 May 2024). One crucial aspect is facilitating multi-agency coordination at incident or event sites in one location, making decision-making and response faster and more effective.

The innovative use of existing technologies, such as surveillance cameras and GIS, in a mobile and integrated manner, demonstrates how these tools can be repurposed to meet new challenges in traffic management. The integration of existing standards such as ISO 11073 for health informatics and ISO 19107 for spatial schema in GIS adds value to the project.

The application of AI for real-time traffic analysis and decision-making represents a significant advancement in how traffic data is collected, analyzed, and utilized to improve road conditions. This implementation uses standards like ISO 29182 for sensor networks and ISO 17572 for location referencing to enhance its effectiveness.

While primarily leveraging existing technologies, the project also involves the development of new communication protocols and data analysis algorithms tailored specifically for the needs of a mobile traffic control centre. This development aligns with standards such as ISO 17215 for video communication and ISO 13185 for cooperative ITS.

The project surpasses minimum regulatory requirements by integrating advanced technologies and innovative approaches to traffic management. It sets a new standard for how cities can handle traffic during peak times and special events. Compliance with standards such as ISO 39001 for road traffic safety management systems and ISO 26262 for functional safety in road vehicles underscores its excellence.

Eng. Hamad Bakheet Thabet
Director, Traffic Management Division, ITS Sector, Integrated Transport Center - Abu Dhabi, UAE

" Winning the IRF Global Road Achievement Award for our Mobile Traffic Management Centre is a testament to our commitment to leveraging advanced technologies to enhance road safety and mobility. This recognition reinforces Abu Dhabi's leadership in smart transportation solutions, which are vital to our vision of sustainable and efficient urban mobility. Our collaboration with the International Road Federation has been instrumental in sharing expertise and adopting best practices that drive innovation in road and transport systems globally. "

TRAM/TRAFFIC SMART SAFETY INITIATIVES PROJECT

ROADS AND TRANSPORT AUTHORITY (RTA), DUBAI, UAE

The Roads and Transport Authority (RTA) is responsible for the efficient & sustainable movement of transport in Dubai. A key component of this responsibility is road safety, which directly relates to one of RTA's goals "Safety and Environmental Sustainability". The increasing rate of car ownership and transportation systems needs has been a direct result of a fast-growing economy and increase in population. Dubai Tram's Safe integration into the broader public transportation network is a key focus for RTA. The tram seamlessly & safely connects with other mobility services, including the metro, buses, taxis and cycling lanes, ensuring accessibility to various destinations and aligning with the emirate's vision of promoting sustainable and preferred mobility choices.

In December 2023, it was announced that Dubai Tram has remarkably served approximately 52 million riders since its inauguration in 2014. Over the course of its nine-year journey, the Dubai Tram has safely covered 5.3 million kilometres, connecting 11 stations. It is at grade driver operated people mover that interfaces with the road network at 21 junctions, it has eight minutes headway covering approximately 623,000 km travelled annually.

The Tram Smart Safety Initiatives project reflects RTA's strategy for achieving sustainable development and improving the city's quality of life. RTA reiterates its commitment to adopting the smart technologies in transportation, which enhances the passenger experience in Dubai. The smart initiatives sustain a safe environment around Dubai Tram/road interface to complement the overarching Traffic Safety Strategy and its five-year Action Plan to reach "vision Zero" accidents between the Tram and other road users. This is achieved by using the latest technologies and innovations to launch a Next Best Practice in smart and innovative safety measures like traffic signal LED Backboards, Pedestrian audible alarms and Blank out activated vehicular/pedestrian signs.

Twenty smart initiatives were studied according to a comprehensive evaluation criterion (details below), twelve initiatives were chosen with the top four selected for pilot initiatives at various tram/road intersections as per the following Criterion:

- Compatibility with the existing operations.
- Risks – (Security, Operational, Technology & Failure Risks).
- Licensing Requirements.
- Long Term Maintenance – (Effectiveness, Reach, Impact).
- Life Cycle Cost.
- Other Factors - (Availability, Lead time, Infrastructure readiness).

In 2023, after a six-month evaluation period for the LED Outlined Backboards, it yielded a significant reduction in red-light violations from 948 to 697 (27%). To maintain the successful approach and demonstrate a culture of continuous improvement, the initiative is being rolled out to the remaining tram/road intersections in 2024/2025.

Also, Dubai Tram has witnessed 59% improvements in the Near Misses between the Tram and other road users due to the significant counter-measures stipulated in the Dubai Road Safety Strategy and the Tram/Road Safety Strategy.

The impactful initiatives resulted in developing the journey toward revolutionizing urban mobility and RTA's commitment to sustainable and safe transportation solutions. Replicable initiatives are currently being developed and will go ahead once the site evaluation of the LED Outlined Backboards for the traffic signals take place.

Hussain AL Banna
CEO, Traffic and Roads Agency, RTA

" Winning the IRF Global Road Achievement Award for our Tram Smart Traffic Safety initiatives project is a profound honor and a significant milestone for the Roads and Transport Authority. This prestigious recognition highlights our relentless commitment to advancing urban mobility through cutting-edge technology and innovative traffic safety solutions. Our Tram Smart Traffic Safety initiatives represent a transformative approach to enhancing the efficiency and safety of public transport in Dubai. This award not only validates our efforts but also reinforces our dedication to setting new benchmarks in the global transportation sector. The International Road Federation plays a crucial role in promoting best practices worldwide, providing a platform for sharing groundbreaking advancements and fostering global collaboration. This award underscores our shared vision for a smarter, safer, and more sustainable future in urban transit. "

2025 GRAA Application Information

APPLICATION DEADLINE: MAY 8, 2025

The application package must include:

1. A completed application form
2. A project summary (<500 words)
3. An explanation of how the project meets the criteria of the category in which it has been submitted (~100 words)
4. Microsoft PowerPoint® presentation (.ppt or .pptx) including but not limited to slides, photographs, drawings, diagrams, videos, or additional explanatory materials. (Presentations should be limited to 30 slides or less).
   - If completing a paper application, please compress all your files into a single ZIP archive and send the files via email (if <5MB) or a file-sharing service (if ≥5MB) such as Dropbox, WeTransfer, ShareFile or other like service.
     OR
   - Complete our online application, which includes built in file uploading (https://irf.wufoo.com/forms/2025-graa-application)

Incomplete applications will not be considered. All materials must clearly identify the name of the project, the award category, and contact information of the submitting applicant.

Please note:
The submission of copyrighted material to IRF for the Global Road Achievement Awards shall constitute a general grant of permission to IRF to use the materials for promotional purposes.

Each application package must be accompanied by a non-refundable entry fee of $400 for IRF Member, $875 for non-members. A separate application package (accompanied by payment of the entry fee) must be submitted for each project entered in each category.

Entry packages must be received by the IRF, at the address listed below, by 5:00pm EST on May 8, 2025. Entries must be addressed to:

Global Road Achievement Awards
c/o International Road Federation
500 Montgomery Street.
5th Floor
Alexandria, VA 22314 USA

For further information, please contact:
graa@IRF.global
Tel: +1 703 535 1001

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Accra, Ghana | Nairobi, Kenya | Kuala Lumpur, Malaysia

TRAINING INSTITUTES
Alexandria, VA USA | Dubai, UAE | Zagreb, Croatia

2025 GRAA Application Information

APPLICATION DEADLINE: MAY 8, 2025

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OR

- Complete our online application, which includes built in file uploading **(https://irf.wufoo.com/forms/2025-graa-application)**

For further information, please contact: graa@IRF.global | Tel: +1 703 535 1001

www.IRF.global

Project Profile: I-4 Ultimate

photo credit: Florida Department of Transportation

Location	Orlando, Florida
Project Sponsor / Borrower	Florida Department of Transportation I-4 Mobility Partners
Program Areas	
Mode	Highway / Express Lanes
Description	The I-4 Ultimate project is the reconstruction and widening of 21 miles of I-4 from west of Kirkman Road in Orange County, Florida through downtown Orlando to east of State Road 434 in Seminole County. The project will: • Fully reconstruct the existing general purpose lanes • Add four express toll lanes in the median • Reconstruct 15 major interchanges • Reconstruct, construct, or widen 140 bridges The existing general purpose lanes, which range from three to four lanes in each direction are approximately 50 years old and experience significant levels of congestion. The Florida Department of Transportation (FDOT) will set toll rates and collect all revenue. Access and egress will be provided at five exchange areas (crossover zones) and by direct connectors at major intersections. The project is being procured as a 40-year design-build-finance-operate-maintain availability payment concession, with the private partner receiving milestone and completion payments during and immediately following construction completion. These milestone payments and availability

	payments during the operational period are not tied to toll revenue collections and will come from a variety of regional, state, and federal revenue sources.
Cost	$2,877 million
Funding Sources	Senior bank debt - $484 million TIFIA Tranche A loan - $127.3 million TIFIA Tranche B loan - $822.2 million Equity contribution - $103 million FDOT milestone payments during construction - $1.035 billion TIFIA capitalized interest and interest income - $306 million
Project Delivery / Contract Method	Design-build-finance-operate-maintain Availability Payment Concession (40 years)
Private Partner	I-4 Mobility Partners • John Laing Investments Limited (29% equity partner, 50% project owner) • Skanska Infrastructure Development (71% equity partner, 50% project owner) Design-build joint venture • Skanska USA Civil Southeast, Inc. (40%) • Granite Construction Company (30%) • Lane Construction Corporation (30%) Design joint venture • HDR Engineering • Jacobs Engineering Group Operations and maintenance - Infrastructure Corporation of America
Project Advisors / Consultants	To Sponsor (FDOT) • Nossaman - Legal Advisor • KPMG - Financial Advisor • Reynolds Smith and Hill - Technical Advisor To the Borrower (I-4 Mobility Partners) • Société Générale - Financial Advisor • Ashurst - Legal Advisor To USDOT TIFIA JPO • TIFIA Legal Advisor - Hawkins Delafield & Wood • TIFIA Financial Advisor - Scully Capital Services, Inc.
Lenders	USDOT TIFIA 6-bank club (senior bank debt) • Société Générale • MUFG • Canadian Imperial Bank of Commerce • KfW-IPEX Bank • Svensk Exportkredit

	• Credit Agricole
Duration / Status	I-4 Mobility Partners were selected by FDOT as the preferred bidder on April 23, 2014. Construction began in February 2015 and is expected to be substantially complete in 2021.
TIFIA Credit Assistance	Direct Loan - $949 million The TIFIA loan is structured in two tranches: • $127.3 million of TIFIA debt (TIFIA Tranche A) will be repaid in full by the second Final Acceptance Payment from FDOT in 2021; and • $822.2 million of TIFIA debt (TIFIA Tranche B) which is repaid from the Availability Payments made by FDOT through final maturity in 2052.
Financial Status / Financial Performance	Financial close occurred and TIFIA credit agreement was executed on September 4, 2014. Milestone payments during construction (2015-2019) will total $1,035 million. The balance of FDOT's capital payments will be made in 2020 and 2021 totaling $688 million.
Innovations	• The project includes numerous aesthetic treatments, including a signature pedestrian bridge, accent lighting, fountain illumination, art sculptures and monuments, and other architectural treatments • The project incorporates 25 approved technical concepts that exceed the minimum requirements established by FDOT for basic configuration, project scope, and design criteria. These include innovations in traffic flow, safety, community connections, sustainability, and use of technology. Further detail can be found on the project website.
Related Links / Articles	FDOT Project Website FDOT I-4 Express PD&E Study FDOT Contract Documents
Contacts	Loreen C. Bobo, P.E. I-4 Ultimate Construction Program Manager Florida Department of Transportation Tel: (386) 943-5541 loreen.bobo@dot.state.fl.us

專案簡介： I-4 Ultimate

照片來源：佛羅裡達州交通部

地點	佛羅裡達州奧蘭多
專案發起人/借款人	佛羅裡達州交通運輸部 I-4 行動合作夥伴
專案領域	
模式	高速公路/快速車道
描述	I-4 Ultimate 計畫是重建和拓寬 21 英里長的 I-4 公路，從佛羅裡達州奧蘭治縣柯克曼路以西經奧蘭多市中心到塞米諾爾縣 434 號州際公路以東。該項目將： • 全面改造現有通用車道 • 在中間地帶增加四個快速收費車道 • 重建15處主要立交 • 重建、建造或拓寬 140 座橋樑 現有的通用車道每個方向有三到四條車道，已有大約50年歷史，而且交通擁堵嚴重。 佛羅裡達州交通部 (FDOT) 將制定收費費率並收取所有收入。將在五個交換區（交叉區）和主要交叉路口的直接連接器處提供出入。 該專案採用 40 年設計-建造-融資-營運-維護可用性付款特許權採購方式，私人合作夥伴將在施工完工期間和施工完工後立即獲得里程碑付款和完工付款。營運期間的這些里程碑付款和可用性付款與通行費收入無關，而是來自各種地區、州和聯邦收入來源。
成本	28.77 億美元
資金來源	優先銀行債務 - 4.84億美元

TIFIA A 部分貸款 - 1.273 億美元

TIFIA B 部分貸款 - 8.222 億美元

股權貢獻——1.03億美元

FDOT 建設期間的里程碑付款 - 10.35 億美元

TIFIA 資本化利息和利息收入 - 3.06 億美元

專案交付/合約方式

設計-建造-融資-營運-維護可用性付款優惠（40 年）

私人合作夥伴

I-4 行動合作夥伴

- John Laing Investments Limited（29% 股權合夥人，50% 專案所有者）
- 斯堪斯卡基礎設施開發公司（71% 股權合夥人，50% 專案所有者）

設計-建造合資企業

- 斯堪斯卡美國東南土木工程有限公司 (40%)
- 花崗岩建築公司 (30%)
- Lane 建築公司 (30%)

設計合資

- HDR 工程
- 雅各工程集團

營運和維護 - 美國基礎設施公司

專案顧問/諮詢師

致贊助商 (FDOT)

- Nossaman - 法律顧問
- 畢馬威 - 財務顧問
- Reynolds Smith and Hill - 技術顧問

致借款人（I-4 流動合作夥伴）

- 法國興業銀行 - 財務顧問
- 艾舍斯特 - 法律顧問

致 USDOT TIFIA JPO

- TIFIA 法律顧問 - Hawkins Delafield & Wood
- TIFIA 財務顧問 - Scully Capital Services, Inc.

貸款人

USDOT TIFIA
六家銀行俱樂部（優先銀行債務）

- 法國興業銀行
- 三菱日聯金融集團
- 加拿大帝國商業銀行
- 德國復興信貸銀行
- 瑞典出口信貸公司
- 法國農業信貸銀行

持續時間 / 狀態

2014 年 4 月 23 日，I-4 Mobility Partners 被 FDOT 選為優先投標者。

工程於 2015 年 2 月開工，預計 2021 年基本完工。

TIFIA 信貸援助	直接貸款 - 9.49 億美元 TIFIA 貸款分為兩部分： • 1.273 億美元的 TIFIA 債務（TIFIA Tranche A）將於 2021 年透過 FDOT 的第二筆最終驗收付款全額償還；和 • 8.222 億美元的 TIFIA 債務（TIFIA B 部分）將透過 FDOT 在 2052 年最終到期前支付的可用款項償還。
財務狀況/財務表現	財務結算已完成，TIFIA 信貸協議已於 2014 年 9 月 4 日執行。 FDOT 的資本支付餘額將於 2020 年和 2021 年支付，總額為 6.88 億美元。
創新	• 該項目包含多項美學設計，包括標誌性的人行天橋、重點照明、噴泉照明、藝術雕塑和紀念碑以及其他建築設計 • 該專案採用了 25 項已獲批准的技術概念，超出了 FDOT 對基本配置、專案範圍和設計標準設定的最低要求。這些包括交通流、安全、社區聯繫、永續性和技術使用方面的創新。更多詳細資訊請參閱該項目網站。
相關連結/文章	FDOT 專案網站 FDOT I-4 Express PD&E 研究 FDOT 合約文件
聯絡方式	Loreen C. Bobo，PE I-4 Ultimate 建築專案經理 佛羅裡達州交通部 電話：(386) 943-5541 loreen.bobo@dot.state.fl.us

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Understanding Traffic Signal Work on Roadway Projects
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I-4 Beyond the Ultimate: Building a Better I-4

Construction on the Florida Department of Transportation's (FDOT's) I-4 Beyond the Ultimate is underway in Orange, Osceola, and Seminole counties, bringing improvements to the areas of greatest need as soon as funding becomes available.

In Orange County, major Interstate 4 (I-4) interchange improvements include:

- Introduction of a new construction-phase diverging diamond interchange (DDI) at Sand Lake Road (State Road (S.R.) 482) in March 2024. Implementing this DDI gives crews space to work in the median of Sand Lake Road. Crews need that room to complete overhead bridge work, reconstruct the I-4 general use lanes, and extend I-4 Express from near Kirkman Road over Sand Lake Road. The express lanes will transition to a single, westbound, buffer-separated express lane from west of Sand Lake Road and tie in just west of Central Florida Parkway. The I-4 and Sand Lake Road interchange will continue to undergo improvements until anticipated completion in 2027.
- Conversion of the Daryl Carter Parkway overpass into a DDI. This project is transforming the existing I-4 overpass into an interchange with three new ramps: exit ramps from eastbound and westbound I-4 and an entrance ramp to eastbound I-4. A westbound I-4 entrance ramp will be part of a future project. This project includes an express lane extension from the Sand Lake Road project to west of Daryl Carter Parkway. FDOT expects to complete the project by early 2026.
- Partial reconstruction of the I-4 and Apopka-Vineland Road (S.R. 535) interchange, which began in 2023. This project will partially reconstruct the interchange to enhance safety and improve access to and from westbound I-4. A new loop ramp from northbound Apopka-Vineland Road to westbound I-4 will enhance mobility and safety by eliminating the need for motorists to turn left across traffic. This project is also extending the I-4 express lane to just west of S.R. 536. FDOT expects the project to reach completion in 2026.
- Ramp widening the westbound I-4 exit to eastbound S.R. 528 (Beachline Expressway) from one lane to two. FDOT began this capacity project in 2024 and anticipates reaching

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completion in 2026.

Two projects are underway in Seminole County:

- Improvement of the I-4 and U.S. 17-92 interchange project began in 2023. The project will improve sight distances for motorists, upgrade sidewalks for pedestrians and bicyclists, and reduce the speed limit from 50 mph to 35 mph. The project will also add an auxiliary lane on eastbound U.S. 17-92 and add turn lanes in the interchange. FDOT expects to complete the project by late 2024.
- Capacity improvements to the intersection of County Road (C.R.) 46A (H.E. Thomas Jr. Parkway) and Rinehart Road began in 2023. This project will improve capacity and efficiency while reducing congestion at the I-4 and C.R. 46A interchange. Plans include modifying select existing turn lanes and adding new turn lanes. The project will also add a new third lane to southbound Rinehart Road between C.R. 46A and Timacuan Boulevard. FDOT expects to complete the project in 2025.

Several I-4 Beyond the Ultimate projects have been completed. A DDI opened in July 2022 at I-4 and C.R. 532 near ChampionsGate. The project added bike lanes and sidewalks along C.R. 532 to improve cyclist and pedestrian connectivity and safety.

New I-4 auxiliary lanes opened in 2023 in both directions between C.R. 532 and S.R. 429 in Osceola County, and a new auxiliary lane opened in summer 2023 on northbound S.R. 429 between I-4 and Sinclair Road. FDOT crews also milled and resurfaced S.R. 429 between I-4 and Sinclair Road. FDOT completed that project in 2023. In summer 2024, the Department also completed the milling and resurfacing of I-4 in Osceola County from World Drive to the Orange County Line.

Safety on Florida's roadways is everyone's responsibility. FDOT urges motorists to practice safe driving habits, such as paying attention to the road and their surroundings in the work zone.

Sign up for personalized text or email alerts for advance notification of construction impacts.

Sign up for the project's newsletter for construction updates and other project news.

新的 I-4 入口匝道在 Sand Lake Road 開放

閱讀更多

I-4 超越終極：打造更好的 I-4

佛羅里達州交通部（FDOT）的 I-4 Beyond the Ultimate 正在奧蘭治縣、奧西奧拉縣和塞米諾爾縣進行施工，一旦資金到位，就會改善最需要的地區。

在奧蘭治縣，4 號州際公路（I-4）立交橋的主要改進包括：

- 2024 年 3 月在 Sand Lake Road（國道（S.R.）482））引入新的施工階段分叉鑽石立交橋（DDI）。實施此 DDI 為工作人員提供了在 Sand Lake Road 中間工作的空間。工作人員需要這個空間來完成高架橋工作，重建 I-4 通用車道，並將 I-4 Express 從 Kirkman Road 附近延伸到 Sand Lake Road。快速車道將從 Sand Lake Road 以西過渡到一條西行、緩衝區分離的快速車道，並在佛羅里達州中部公園大道以西相連。I-4 和 Sand Lake Road 立交橋將繼續進行改進，直到預計於 2027 年完工。
- 將 Daryl Carter Parkway 立交橋改建為 DDI。該專案正在將現有的 I-4 立交橋改造成一個帶有三個新匝道的立交橋：東行和西行 I-4 的出口匝道以及通往東行 I-4 的入口匝道。西行的 I-4 入口匝道將成為未來專案的一部分。該專案包括從 Sand Lake Road 專案到 Daryl Carter Parkway 以西的快速車道延伸。FDOT 預計將於 2026 年初完成該專案。
- I-4 和 Apopka-Vineland Road（S.R. 535）立交橋的部分重建，於 2023 年開始。該專案將部分重建立交橋，以提高安全性並改善進出 I-4 西行的通道。從 Apopka-Vineland Road 北行到 I-4 西行的新環形匝道將消除駕車者在車流中左轉的需要，從而提高機動性和安全性。該專案還將 I-4 快速車道延伸到 S.R. 536 以西。FDOT 預計該專案將於 2026 年完工。
- 匝道將 I-4 西行出口拓寬至東行 S.R. 528（Beachline 高速公路）從一條車道拓寬至兩條車道。FDOT 於 2024 年開始了這個容量專案，預計將於 2026 年完成。

塞米諾爾縣正在進行兩個專案：

- I-4 和美國 17-92 立交橋項目的改進於 2023 年開始。該專案將改善駕車者的視距，升級行人和騎自行車的人行道，並將限速從 50 英里/小時降低到 35 英里/小時。該專案還將在U.S. 17-92 東行公路上增加一條輔助車道，並在立交橋上增加轉彎車道。FDOT 預計將於 2024 年底完成該專案。

- County Road（C.R.）46A（H.E. Thomas Jr. Parkway）和 Rinehart Road 交叉口的容量改善於 2023 年開始。該專案將提高容量和效率，同時減少 I-4 和 C.R. 46A 交匯處的擁堵。計劃包括修改、選擇現有轉彎車道和添加新的轉彎車道。該專案還將在 C.R. 46A 和 Timacuan Boulevard 之間的 Rinehart Road 南行道路上增加一條新的第三車道。FDOT 預計將於 2025 年完成該專案。

幾個 I-4 Beyond the Ultimate 項目已經完成。DDI 於 2022 年 7 月在 ChampionsGate 附近的 I-4 和 C.R. 532 開放。該專案沿 C.R. 532 增加了自行車道和人行道，以改善騎行者和行人的連通性和安全性。

2023 年，奧西奧拉縣 C.R. 532 和 S.R. 429 之間的新 I-4 輔助車道雙向開通，2023 年夏季在 I-4 和 Sinclair Road 之間的 S.R. 429 北行車道開通。FDOT 工作人員還在 I-4 和 Sinclair Road 之間銑刨和重鋪了 S.R. 429。FDOT 於 2023 年完成了該專案。2024 年夏天，該部門還完成了奧西奧拉縣從 World Drive 到 Orange County Line 的 I-4 公路的銑刨和路面重鋪。

佛羅里達州道路的安全是每個人的責任。FDOT 敦促駕駛者養成安全的駕駛習慣，例如注意工作區的道路和周圍環境。

註冊個人化簡訊或電子郵件提醒，提前通知施工影響。

註冊該專案的時事通訊，瞭解施工更新和其他項目新聞。

I-4 Beyond the Ultimate

Aesthetics Local Coordination Meeting

I-Drive Improvement District Advisory Board

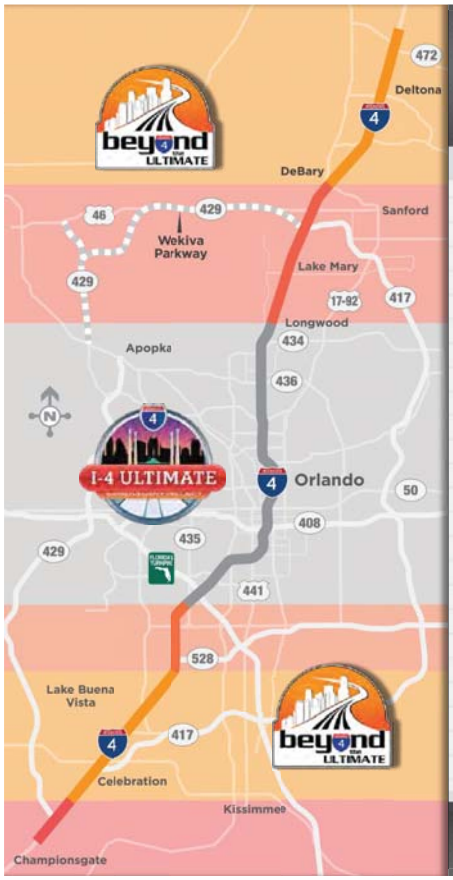
January 31, 2018

I4Express.com

Agenda

- Introductions
- Overview of Work Zone
- Aesthetics Process
- Bridge Aesthetics
- Lighting Aesthetics
- Landscaping

I4Express.com



I-4 Beyond the Ultimate

- 40 miles of I-4 reconstruction currently under design
- Extends eastern endpoint of managed lanes by 20 miles and western endpoint by 20 miles

I4Express.com

beyond the ULTIMATE

I-4 Beyond the Ultimate Includes Barrier-Separated Express Lanes

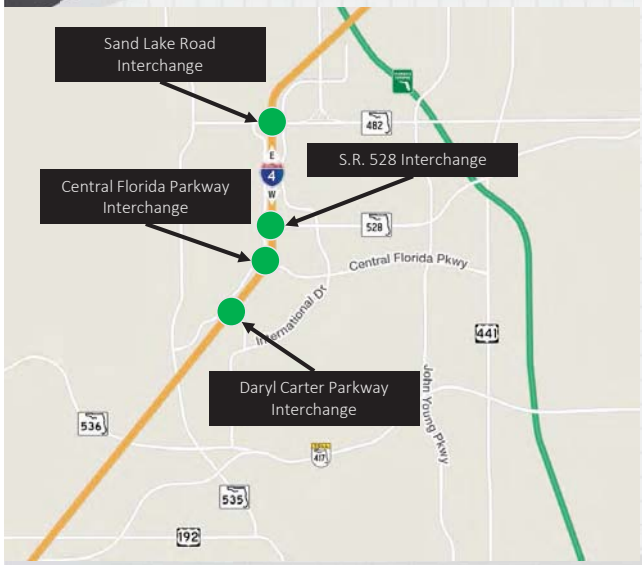
6 general use lanes + auxiliary lanes

4 Express Lanes (2 in each direction)

Seamless Travel Between I-4 Ultimate & I-4 Beyond the Ultimate

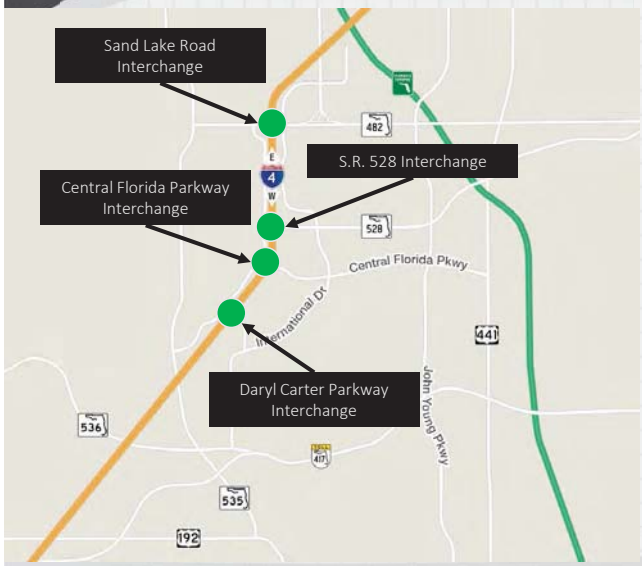
- Aesthetic treatments consistent with I-4 Ultimate
- Tolling gantries, pylons, lighting and signage also consistent

Overview of Segment 2



- From west of Central Florida Parkway to west of S.R. 435/Kirkman Road
- Includes segment of S.R. 528 from I-4 to west of Universal Boulevard
- Right-of-way and construction are funded
- Construction expected to begin in FY 2020 (as early as November 2019)
- *Direct Connect Ramps* between I-4 Express Lanes and S.R. 528 Express Lanes

S.R. 528 Interchange Improvements



- Signature interchange in Segment 2
- Interchange bridges will receive base aesthetic treatment for consistency with the rest of I-4
- Orange County Convention Center is determining aesthetic treatment on its west entrance

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Aesthetics Process

- Overall goal:
  - An I-4 Beyond the Ultimate Segment 2 Bridge Aesthetics Agreement/ memorandum of understanding (MOU) with Orange County and the Orange County Convention Center
- Who's involved?
  - FDOT
  - Orange County
  - Orange County Convention Center
  - I-Drive Improvement District Advisory Board to provide feedback via Orange County
- MOU to be used in the procurement and long-term maintenance of this segment
  - Design/Build RFP
  - Who will pay for long-term maintenance?
    - Landscaping
    - Aesthetic treatments

Aesthetics Process

- Timeline
  - MOU between Orange County and FDOT signed August 2018 (release of RFP)
  - Custom treatment designs subject to same deadline
- End result
  - Design for three bridges that's consistent with the I-4 corridor

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Aesthetic Options

Bridges To Be Reconstructed

- Segment 2 bridges
  - Central Florida Parkway
  - Sand Lake Road
- Non-reconstructed bridge
  - Daryl Carter Parkway
  - Separate project: bridge will remain, adding full interchange

- Bridge Aesthetic (BA) options
  - Base
  - BA4
  - BA6 — *Disclaimer: BA6 treatments are subject to aesthetics cost budget and right-of-way constraints*
  - Custom

Bridge Architecture: Base Level

- Applied to bridges along the corridor where enhanced levels of treatment are not specified on the plan sheets of the Aesthetic Master Plan
- Includes a wall panel at the bridge corner with rustication designed to reflect the various other levels of treatment
- Does not include specialty lighting or landscape treatments

Bridge Architecture: Level BA4

- Includes a monumental pylon at the bridge corner extending above the barrier walls to be visible from the I-4 travel lanes
- Each pylon includes a circular inset space available for the application of local seals or graphics
- Large circles on the pylons face to the outside and smaller circles face the sidewalk under the bridge
- Does not include specialty lighting or landscape treatments

Bridge Architecture: Level BA6

- Designed to be applied at major gateway intersections, this treatment level includes:
  - taller monumental pylon set back from the corner pylon at the bridge corner with extended lantern style light;
  - a large curved planter wall supporting a raised planting bed forming a terrace for a bosque of signature palms;
  - a circular inset in the corner feature allowing for the application of local seals or graphics;
  - raised lettering along the curved face of the planter wall for place names and cross streets
  - MSE3 wall treatments extending 100' from the bridge corner and MSE2 wall treatments extending from the MSE3 treatments;

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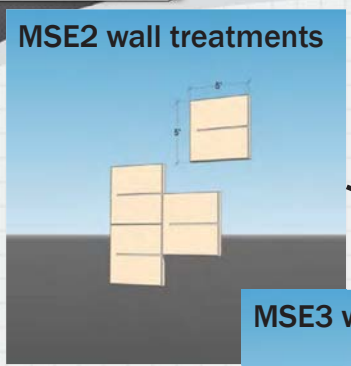
Bridge Architecture: Level BA6



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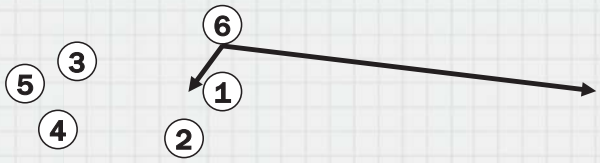
Bridge Architecture: Level BA6

- Specialty lighting for this level includes:
  - frosted or fritted glass enclosure for the extended pylon lantern lights;
  - lines of LED light tracing the pylon articulation;
  - back lighting for the place name and cross street lettering;
  - signature palm uplights (2 per palm) mounted in planter;
  - ground mounted linear uplights in the planter to wash the wall behind palms;
  - wall washing lights mounted to the underside of bridge to illuminate walls

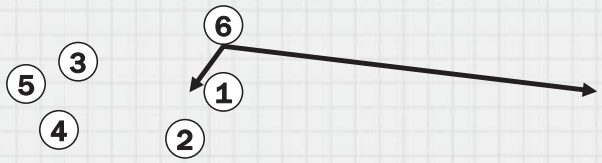
Bridge Architecture: Texture & Color



#33690 Light Tan	#36622 Light Grey
#33446 Sand	#35193 Grey Green

1. Bridge Structure
   1. Color – #35193: Grey Green
2. MSE Bridge Pylons — Thickened MSE Wall Panels with Class 5 Finish (1 Texture, 2 Colors)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33690: Light Tan
   3. Color 2 – #33446: Sand
3. Crash Barrier — Crash Barrier Across Bridge with Class 5 Finish (1 Texture, 1 Color)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33690: Light Tan

Bridge Architecture: Texture & Color



#33690 Light Tan	#36622 Light Grey
#33446 Sand	#35193 Grey Green

4. MSE Walls — Class 5 Finish (1 Texture, 1 Color)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33690: Light Tan
5. MSE Wall Coping — Class 5 Finish (1 Texture, 1 Color)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33446: Sand
6. Cast Stone Logo — Integral Color Concrete
   1. Match Federal Standard Color #33690: Light Tan

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Base Under Bridge Treatment

#33690 Light Tan	#36622 Light Grey
#33446 Sand	#35193 Grey Green

1. Bridge Structure
   1. Color – #35193: Grey Green
2. Architectural Pre-Cast Flat Panel-Pylons — Integral Color Concrete (1 Texture, 1 Color)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33446: Sand
3. Underpass MSE Wall – Base Course and Upper Wall (1 Texture, 2 Colors)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33690: Light Tan
   3. Color 2 – #33446: Sand
4. MSE Wall Coping – Class 5 Finish (1 Texture, 1 Color)
   1. Texture 1 – Smooth Texture
   2. Color 1 – #33446 Sand: Under Street

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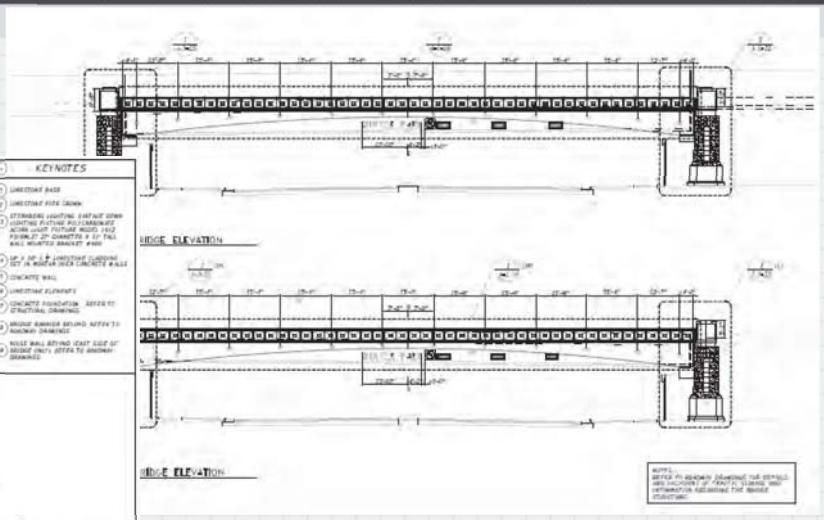
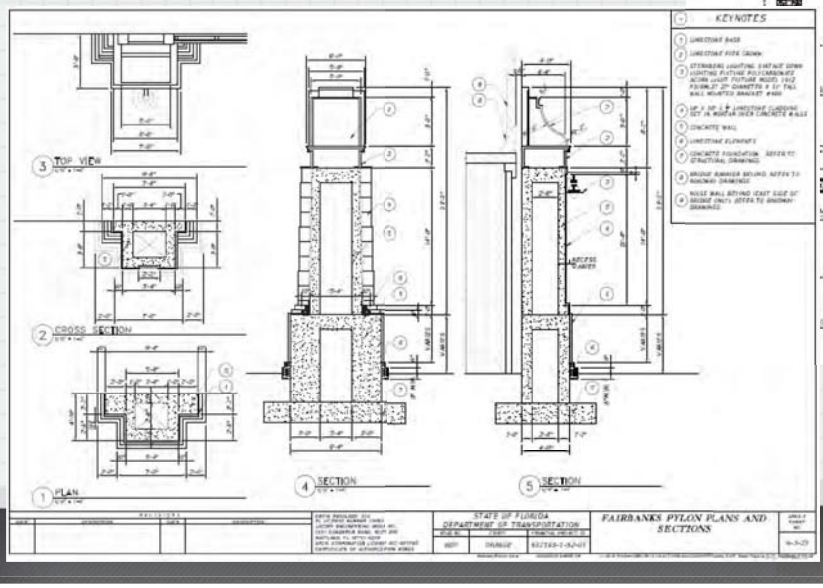
Custom Aesthetics Option

Custom Aesthetics Option





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Daryl Carter Parkway

Bridge Not to Be Reconstructed: Adding Interchange

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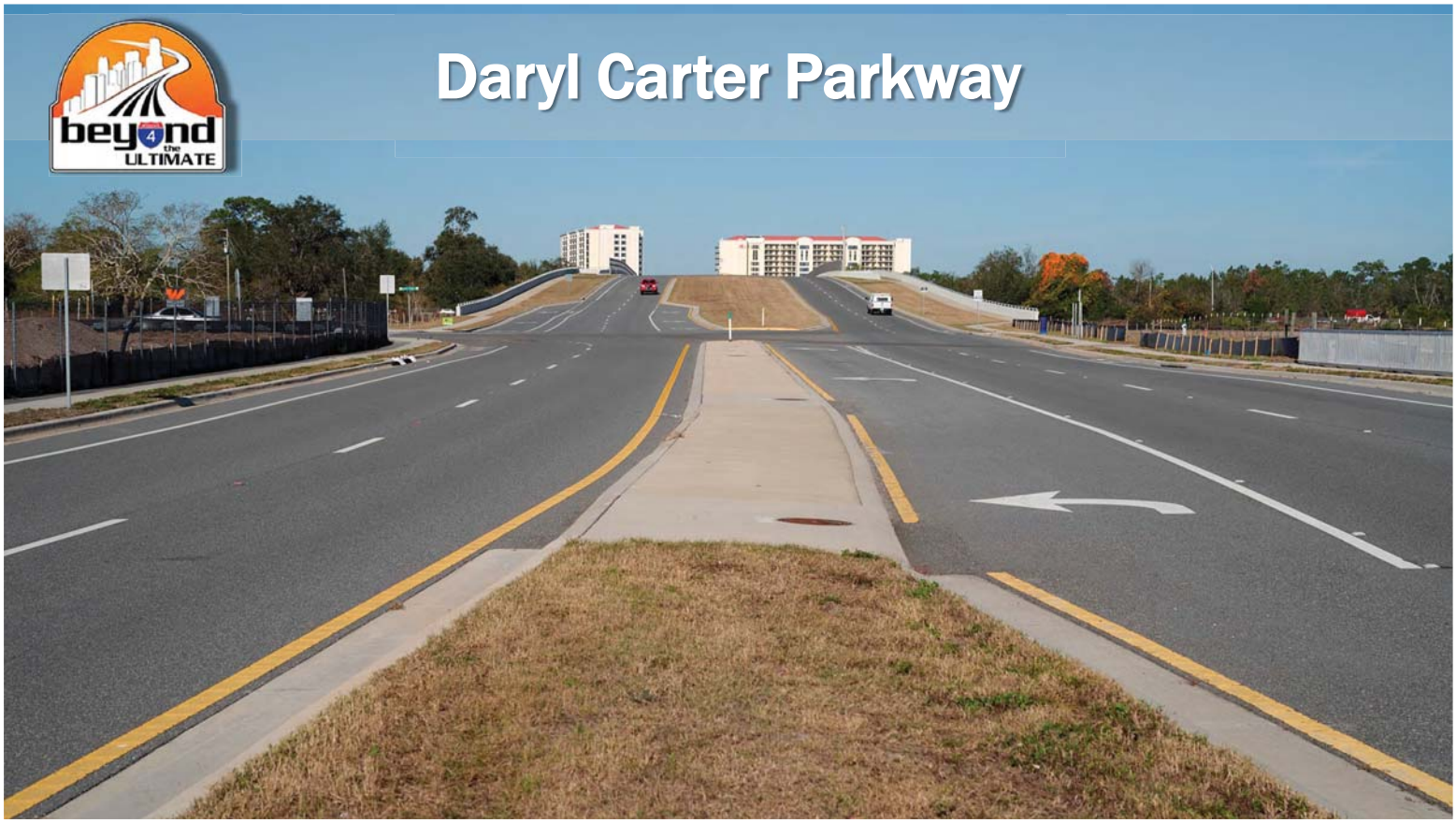
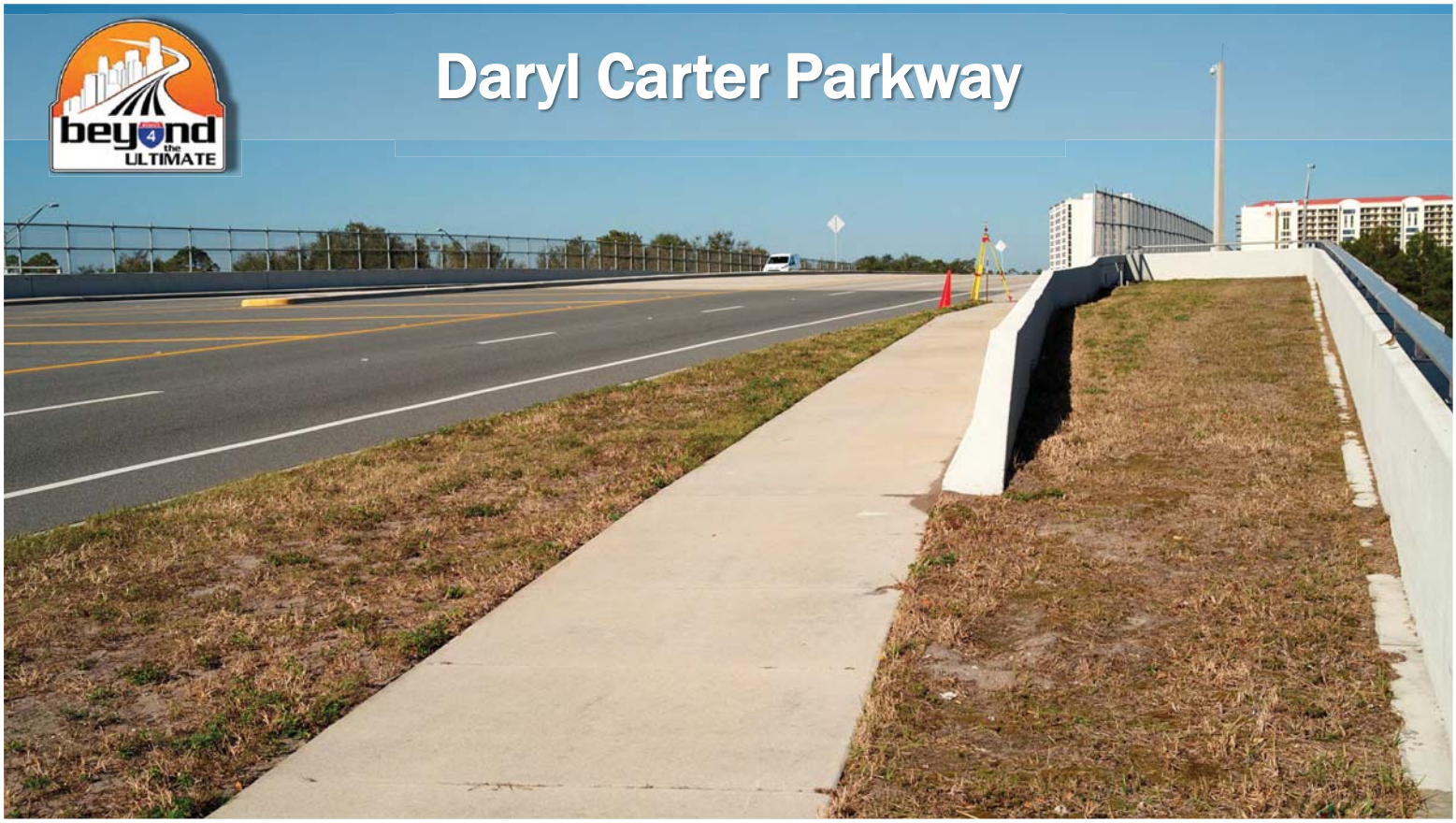
- Proposed Daryl Carter Parkway improvements
  - Maintaining existing bridge
  - Adding interchange ramps
- Bridge Aesthetic level
  - Base treatment being recommended on Daryl Carter bridge and new ramp bridge
  - Opportunity to affect landscaping

Daryl Carter Parkway



Daryl Carter Parkway



Central Florida Parkway

Bridge To Be Reconstructed

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Central Florida Parkway

- Proposed improvement
  - Raising Central Florida Parkway 6′ to address drainage
  - New bridges, including flyover
  - Widening Central Florida Parkway for additional traffic and ramp lanes
  - Making a full interchange (on/off ramps eastbound and westbound)
  - 10′ pedestrian path on south side
- Multiple spans
- Bridge Aesthetic level
  - Opportunity for BA4 for I-4 bridges over Central Florida Parkway

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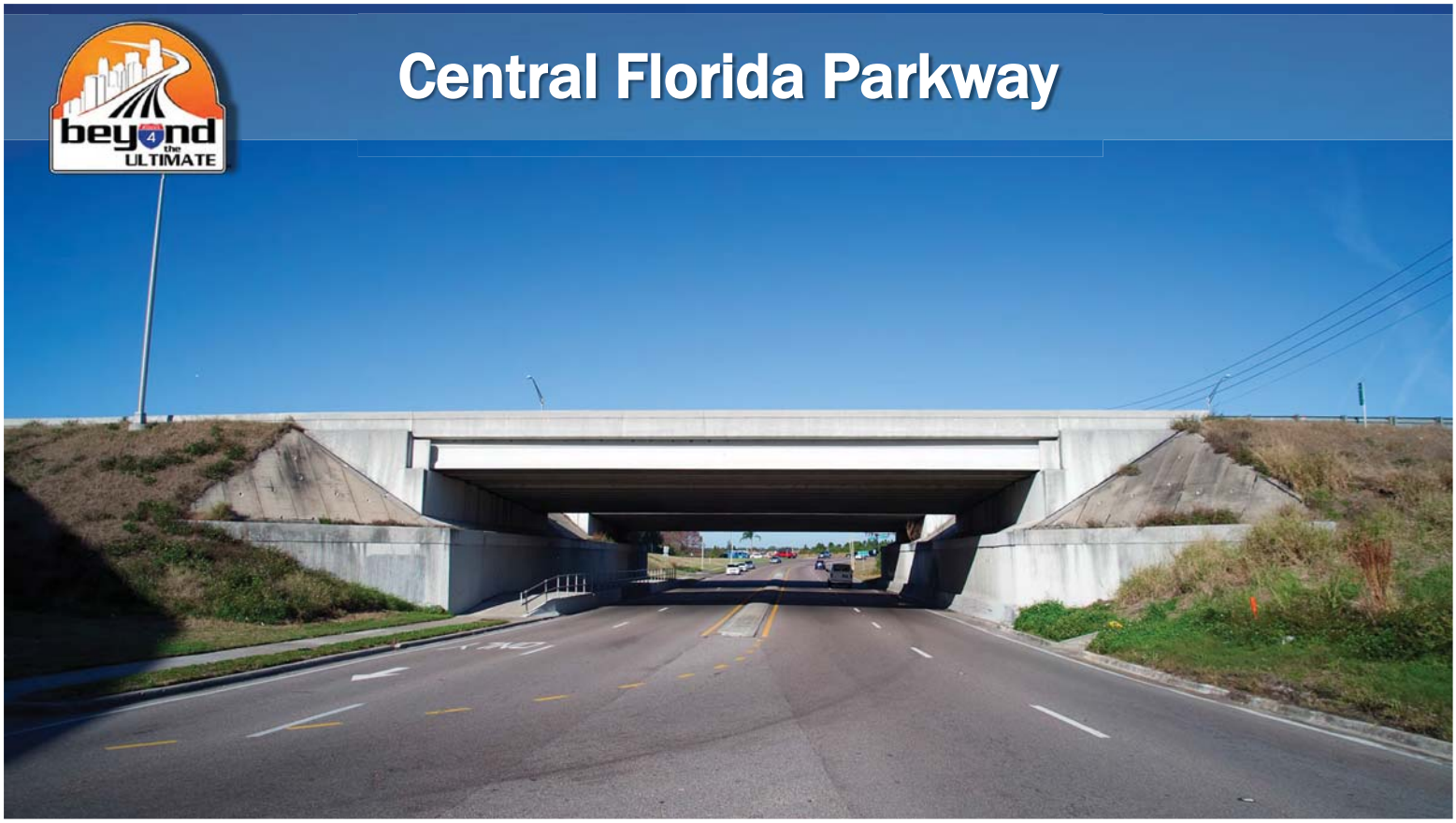
Central Florida Parkway



Central Florida Parkway

Central Florida Parkway

Sand Lake Road

Bridge To Be Reconstructed

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Sand Lake Road

- Proposed improvements
  - All new bridges
  - Improve traffic flow on Sand Lake Road
    - Modified diverging diamond interchange on Sand Lake Road
    - New traffic patterns at Sand Lake Road and Turkey Lake Road — no left turn from Sand Lake to Turkey Lake
  - Pedestrian walkways maintained
  - Orange County studying 10′ pedestrian path along Sand Lake from Turkey Lake under I-4

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Sand Lake Road

- Overall bridge length
  - Being increased
- Number of spans
  - Likely a 2-span bridge
- Bridge Aesthetic level
  - Opportunity to do BA6
  - Your preference?

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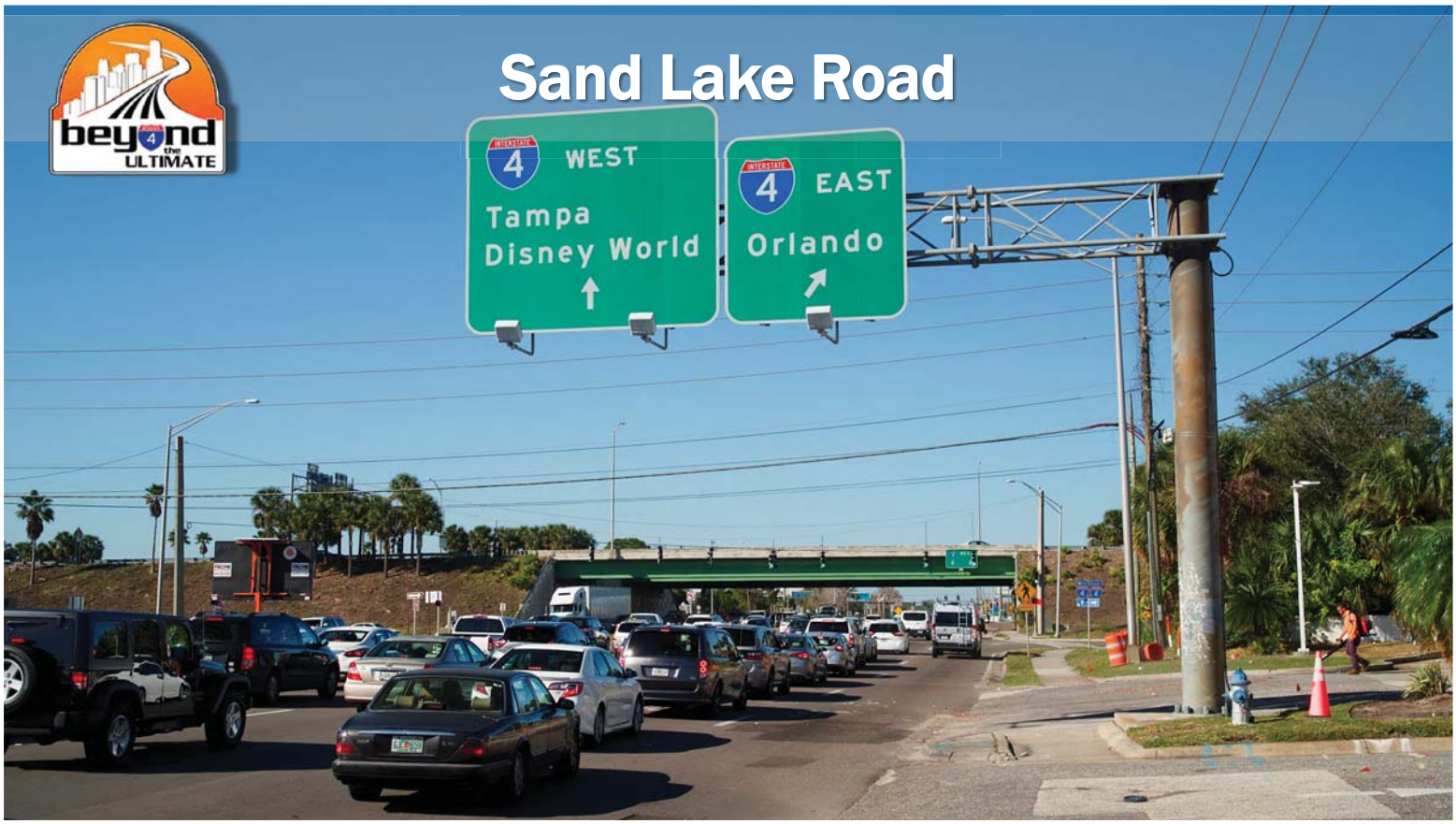
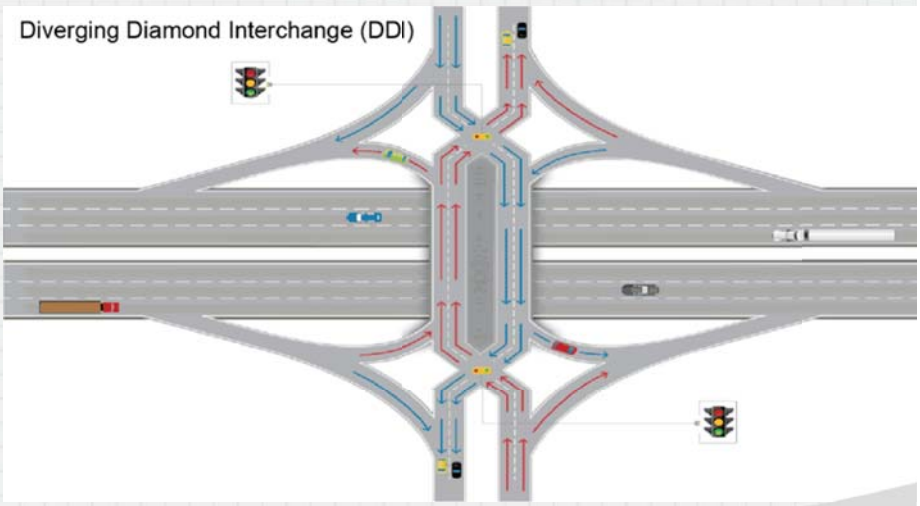

Sand Lake Road
beyond the ULTIMATE
4 WEST
Tampa
Disney World
4 EAST
Orlando


Sand Lake Road
beyond the ULTIMATE
4 WEST

Sand Lake Road

Diverging Diamond Interchange

- Advantages:
  - Safety – removes left turns across oncoming traffic
  - Accommodates more traffic
  - Drivers make free-flow right and left turns to and from the major freeway
  - Meets the needs of all road users, including large trucks, pedestrians and bicyclists



Sand Lake Road

Segment 2 Lighting (Local Roads)

Location	Existing Condition	Limits	Special Aesthetic Lighting	High Mast Lighting	Owner	Proposed Lighting
Daryl Carter Parkway	No existing	Within the influence of the interchange Limits to be defined by design/build team	TBD	TBD	FDOT	Standard
Central Florida Parkway	Existing	Within the influence of the interchange Limits to be defined by design/build team	TBD	TBD	FDOT	Standard
Sand Lake Road	Existing	Within the influence of the interchange Limits to be defined by design/build team	TBD	TBD	FDOT	Standard

Landscaping To Be Performed After I-4 Beyond the Ultimate

- Landscaping will be separate contract after I-4 Beyond the Ultimate is complete to allow study of available options along the corridor
- Intent is to match existing corridor landscaping to keep consistent with adjacent properties

Next Steps

- Schedule second meeting to discuss costs and budget
- Decide on aesthetic options for three bridges
- Meet again with FDOT to present preferred options
- MOU and any additional design submitted to FDOT by August 2018

Questions & Discussion

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Thank you

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For More Information ...

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FDOT

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