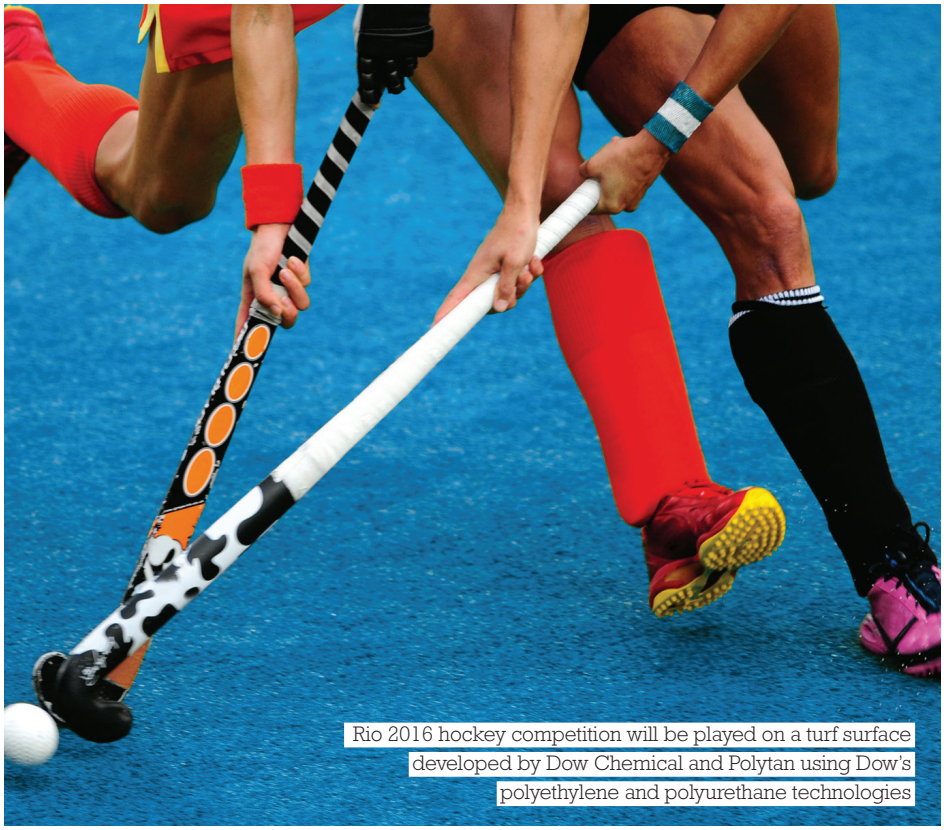
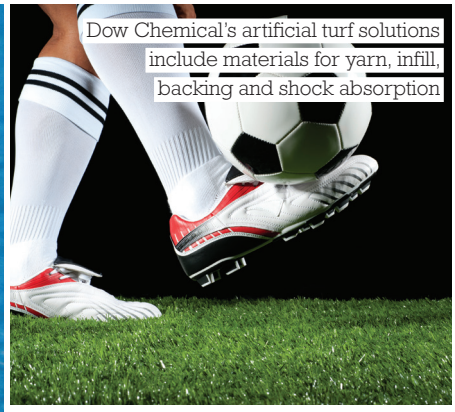
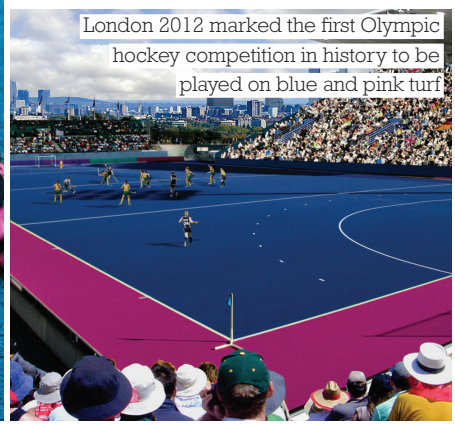
Joint effort: Collaborative development is enabling value chain partners to custom-design turf surfaces to meet specific sport requirements



Rio 2016 hockey competition will be played on a turf surface developed by Dow Chemical and Polytan using Dow's polyethylene and polyurethane technologies



Dow Chemical's artificial turf solutions include materials for yarn, infill, backing and shock absorption



London 2012 marked the first Olympic hockey competition in history to be played on blue and pink turf

Photo: Polytan

In today's ever-evolving artificial turf market, manufacturers must meet increasingly stringent demands, particularly the drive for high-performance sustainable turf solutions tailored for long-term durability. Technology has revolutionized the quality, safety and play performance of fields, with third-generation artificial turf systems making artificial turf surfaces a reality for a variety of sports such as soccer, field hockey and rugby.

Today, the industry is entering the early development cycle of the fourth generation of artificial turf systems. In response to more and more customer demands for enhanced sustainability and even higher performance standards, this new generation turf system will bring even softer and stronger fibers, new infill and non-infill systems, and more efficient and recyclable backing solutions.

These new-generation fields consist of as many as six layers, and getting these different elements working in perfect synergy together is a highly complex process with a number of variables requiring consideration. However, Dow Chemical believes it can accomplish this due to its unique market position, capabilities and collaborative development approach.

Accelerating innovation

Working closely with customers, the company harnesses its R&D and technical capabilities to produce innovative solutions that benefit the entire value chain – including developing octene-based Dowlex polyethylene resins for softer yet tougher yarns, and Enforcer Sport, a polyurethane-based elastomer-backing that is lighter and more efficient for installers, locking the system together to enhance field durability and players' experience.

Dow Chemical's collaborative development approach enables value chain partners to custom-design turf surfaces to meet specific professional sport requirements. Facilitated by Pack Studios, the company's collaborative capability gives partners the opportunity to accelerate innovation by leveraging Dow Chemical's expertise, product portfolio, application testing capabilities and access to a global network of technical experts.

Dow Chemical was recently involved in a successful multiparty collaboration with Polytan, a leading global manufacturer and sports surface supplier, in the development of a high-performance artificial turf system that was chosen by the International Hockey Federation for the Rio 2016 Olympic Games.

Building on a successful partnership forged during London 2012, the field is based on Dow Chemical's polyethylene and polyurethane technologies to create a high-performing, faster and more reliable surface tailored for optimal performance of the players vying for gold in Brazil. ■

RIO 2016
BY MARK BISSON

RACE AGAINST TIME

With just over a year to go until South America hosts its first Olympic Games, ***Stadia*** examines how prepared Brazil's Rio de Janeiro is to host the Games of the XXXI Olympiad

Less than 18 months after the International Olympic Committee (IOC) announced it was considering a possible contingency plan to rescue the delay-hit Rio 2016 Olympic Games, things appear to be back on track – although concerns linger.

The IOC was forced to confront a tidal wave of worries and problems expressed by leaders of the Association of Summer Olympic International Federations (ASOIF) at the SportAccord Convention in Belek, Turkey. The oft-repeated phrase was that Rio 2016 organizers had "no time to lose". The chorus of concerns mainly focused on timelines for venue construction, operational plans and organizational chaos. At the time, there was even talk of the IOC relocating the Games. Instead, it averted the crisis by implementing a package of special measures to greatly accelerate preparations in Rio de Janeiro, including creation of a construction taskforce and improved cooperation between the IOC, Rio 2016 and the three levels of government.

(Clockwise from bottom left) Rio's planned Olympic venues: canoe slalom; BMX track; youth arena at the Deodoro Olympic Complex; Olympic Way; the Olympic park; the Future Arena; aquatic stadium; tennis center; velodrome

A different picture emerged at this year's ASOIF annual assembly on the sidelines of the SportAccord Convention in Sochi, Russia. Rio 2016 chiefs were praised for the progress in venue construction, following a presentation by organizing committee president Carlos Nuzman, sport director Agberto Guimarães and communications director Mario Andrada.

"It is clear in the last year, that despite difficulties in the country – the elections, the political situation and the economic situation – the organizing committee has worked very hard," ASOIF president Francesco Ricci Bitti said at the April meeting. "The situation is totally changed; not all the problems are solved, but we are clearly at a stage so close to the Games that we have to work together and understand each other."

The international federations have been asked by the IOC to shoulder more responsibility than ever before in Olympic preparations – and quickly. Under the IOC's package of Agenda 2020 reforms approved last December in Monaco, France, the international federations are now set to take a more active role in planning their Olympic competitions, harnessing their in-house events expertise, to aid local organizing committees in Games delivery.

Tokyo 2020 will feel more benefits from these reforms than Rio 2016, however the federations' closer collaboration with Rio 2016 in the final 24 months of its seven-year preparation period is paying dividends to help deliver the first South American Olympic Games. That being said, time remains an issue.

Looking to London

The Rio 2016 venues are clustered in four Games zones – Barra, Deodoro, Maracanã and Copacabana. They

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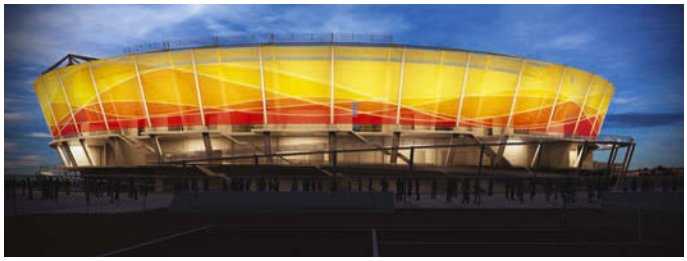
>
> **Francesco Ricci Bitti**, *president,* Association of Summer Olympic Federations



are a mixture of new, existing and temporary facilities. Maracanã, built for the 1950 FIFA World Cup, was extensively renovated to host last year's international soccer showpiece in Brazil. It will host the opening and closing ceremonies, as well as some soccer games. The 46,931-seat Olympic Stadium, home of Botafogo FC, is being expanded to a capacity of more than 60,000 to host athletics events.

Following its role in the London 2012 Olympic and Paralympic masterplan, Aecom has provided the same services for the Rio 2016 park, with the addition of schematic design for seven competition venues and detailed design for the International Broadcasting Center (IBC). The city's Olympic authority, the Municipal Olympic Company (EOM), leads the masterplan process; the outline requirements were defined by the city, the Brazilian Institute of Architects and Rio 2016, with Aecom to undertake the project.

The masterplan embraced the three phases for the development of the Olympic Park – the Games, transition and legacy – with Aecom's proposals for venues incorporated within this. They responded to the desire "to deliver innovative designs and revenue strategies that are models in the industry and for Rio to maximize the return on investment and minimize operating costs," says Adam Williams, director of Aecom Global Sport. "There was a clear focus on efficiency in design to minimize cost and complexity."

He adds that one of the main challenges was the overall delivery program. "We were appointed five years out from the 2016 Olympic Games, whereas our appointment for London was seven years from the Games," he explains. "We delivered the designs for the venues and park in nine months."

Williams is confident the park will be ready and he talks of new venues nearing completion in readiness for test events, which will allow Rio 2016 to finalize event overlay and ensure the best operational efficiency. Williams says the main permanent venue, Carioca Arenas, which includes three arenas, is one of the most advanced, while the tennis center, comprising eight permanent courts and eight temporary courts, and aquatics complex are "progressing well" and the velodrome is "not far behind". The infrastructure budget for the Games is around US$10.76bn.

The 15 competition venues in Barra will stage 23 Olympic sport disciplines, with the Olympic Village, Athletes' Park and International Broadcasting Centre/ Main Press Centre complex also located in the zone. The Olympic Training Centre for high-performance athletes and the Olympic golf complex, which will become the city's first public course, together with the

10,500
athletes from 205 countries will compete at the Games

306
medal events from 42 sports will be contested over 17 days

112
years since golf was last contested at the Games

92
years since rugby was last contested at the Games

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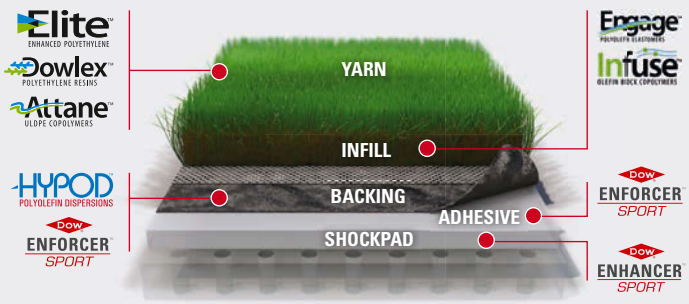

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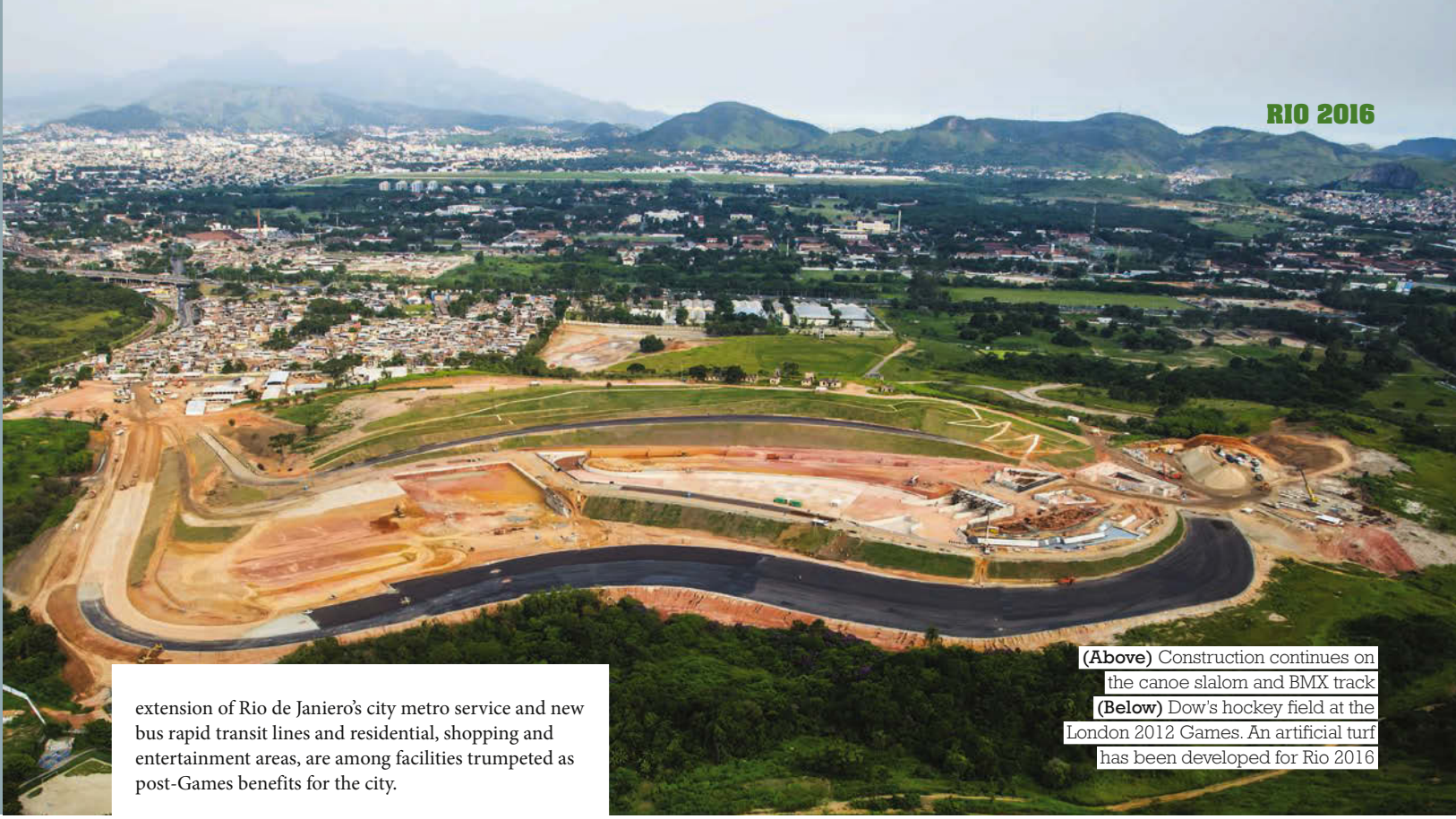

(Above) Construction continues on the canoe slalom and BMX track **(Below)** Dow's hockey field at the London 2012 Games. An artificial turf has been developed for Rio 2016

extension of Rio de Janiero's city metro service and new bus rapid transit lines and residential, shopping and entertainment areas, are among facilities trumpeted as post-Games benefits for the city.

Deodoro delay

Since Rio was awarded the Olympics in 2009, by far the biggest headache for the IOC and Rio 2016 has been the chronically slow pace of preparations at the Deodoro Olympic Complex, the second hub of Games action after the Barra zone, which houses the main Olympic Park.

Beset by planning and building problems, work on the Deodoro site only began last summer to deliver nine venues and infrastructure for eight sports. The venues for equestrian, shooting, the pentathlon pool, and some hockey facilities are already built. Brazil-based BCMF Architects designed the existing facilities at Deodoro for the Rio 2007 Pan American Games and worked on the winning Olympic Games candidature. A Brazilian-Portuguese consortium won the tender for Rio 2016 work.

Meanwhile, significant construction is needed in order to complete the canoeing, cycling, fencing, hockey, modern pentathlon and rugby facilities. Rio 2016 had admitted that the most challenging project is the complex whitewater canoeing course. But city mayor Eduardo Paes, in partnership with Rio 2016, is credited with implementing a strategy to accelerate work. In April, most venues in the Deodoro cluster and Barra Olympic Park were reportedly 50-80% completed. The Olympic Village was around 80% finished.

The sports based at Deodoro are pushing Rio 2016 every step of the way to ensure their different events integrate well and the overall presentation gives the federations the global lift they desperately crave. The first Deodoro test event is scheduled for November.

Innovation showcase

Games organizers and federations are looking forward to showcasing some new innovations at Rio 2016. For example, Dow Chemical, a global Olympic sponsor, has developed an artificial turf surface for hockey, based on its polyethylene and polyurethane technologies. The official chemistry company of the Olympic Games partnered with Polytan on the project, which includes the creation of two hockey fields and one warm-up area at Deodoro, as well as two additional high-performance pitches to be built at the Federal University of Rio.

"Our complete turf system, including embedded shock-pad properties, provides stability, durability, shock-absorption and force-reduction properties for the benefit of the players and the game. The turf system is designed to deliver enhanced durability for increased pitch life, and a consistent field-of-play throughout the busy Olympic competition schedule," says Raquel Fortes, product manager for Dow Chemical.

At Deodoro, Rio 2016 promises a sporting legacy in the shape of the X-Park, which will include the whitewater canoe stadium and BMX center, along with a 5,380,000ft^2 public leisure area. The huge investment in transport infrastructure, improving connections between Deodoro and other parts of the city, is being heralded as another benefit.

For rugby, which will see the sevens competition debut at the Olympics, and golf, which returns to the Games for the first time since 1904, there is a tangible

33
competition venues spread across four regions of the city

39
test events staged from August 2014 to May 2016

7.5
million tickets will be sold

3.8
million tickets will be priced under US$30

8,000
employees, 85,000 outsourced staff and 45,000 volunteers will be required at Rio 2016

(Clockwise from top) An aerial view of Barra's Olympic Village and Athletes' Park; construction continues at the aquatic stadium; the velodrome; Carioca Arenas

sense of relief that, finally, these sports will receive the world-class facilities they have been promised all along. World Rugby is reportedly satisfied that plans are now finally coming together for the 20,000-seat temporary venue to host the rugby sevens competition, which the federation sees as absolutely vital to ensuring that the competition makes a huge statement on its Olympic Games debut.

Delays and legal wrangles have also plagued the preparations for Rio's golf course in Barra. In March, a lawsuit ordering that construction be halted was defeated; in 2014 the golf course was triumphant in a lawsuit against state prosecutors, who demanded changes to the course's design in order to alleviate environmental concerns.

The behind-schedule IBC – billed as the most complex venue for the Games – has troubled the IOC and Olympic Broadcasting Services (OBS) over the past two years. The original finish date was August 2015, but it's now reset to October due to construction delays. Rio 2016 can ill-afford any further slippage; the OBS needs more than seven months to install cabling and broadcast studios.

Finally, Rio's race against the clock also includes tackling the serious problem of pollution in the waters of Guanabara Bay. The International Sailing Federation (ISAF), concerned about the authorities' failure to carry out efficient environmental management plans, is exploring the possibility of moving the Olympic regatta outside of the bay. Rio 2016 acknowledges that it's one of the biggest challenges ahead. "We need to keep the pressure on our government partners around the issues concerning the Guanabara Bay," an ISAF spokesperson told *Stadia*. ■

LEGACY QUESTION MARKS

As some of Brazil's 2014 FIFA World Cup stadia fall victim to a lack of legacy planning, many observers are wondering if Rio 2016's swathe of venues will have a sustainable future when the Games ends.

Aecom's Adam Williams believes the city had a good legacy strategy for the Olympic Park at the outset, noting that the Barra site's permanent venues will become the Olympic Training Centre.

"This was part of Rio's original bid commitment and is a key piece of Brazil's legacy strategy – a commitment to developing its sports capabilities," he says. "The temporary venues will be repurposed after the Games. The handball arena will be converted into new schools for a number of communities across the city. The aquatics center will be transformed into a number of smaller sporting facilities."

Asked how Rio 2016 was trying to avoid the legacy issues afflicting Brazil's FIFA World Cup venues, a City Hall spokesperson told *Stadia* that the mix of permanent and temporary venues reflects initial considerations on "how each Olympic venue would be integrated with the routine of the city post-event". At Barra Olympic Park, the aquatics center and Future Arena will be temporary, with the three Cariocas Arenas, velodrome and existing venues (Maria Lenk Aquatic Park and Arena Rio) remaining post-Games. By 2030 they will form part of a new residential neighborhood with the Olympic Training Center at its heart.

AUTHOR
Mark Bisson is a former editor of *Stadia* magazine, editor of *World Football Insider* and European editor of *Around the Rings*