

INNOVATION  
ENVIRONMENT  
ACTIVITY  
SUSTAINABILITY  
MULTI-USE  
FUTURE GENERATION  
TECHNOLOGY

# **FUTURE TRENDS**

## **FOR OUTDOOR SPORTS SURFACES**





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INNOVATIVE SPORTS SURFACE TECHNOLOGY CAN HELP PROVIDE ACTIVE ENVIRONMENTS.

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## OUTDOOR SPORTS SURFACES REFLECT SPORTS EVOLUTION

As sport has evolved over the past six decades, so has the technology used for the sports' surfaces, with the move from granitic gravel to rubber athletic tracks in the late 1960's, the adoption of watered synthetic turf fields for Hockey in the 1970's and 80's to the advent of 3G fields for the football codes from the turn of the millennium. Now we are ready for the next generation of technology with waterless hockey fields, innovations in football turf fields, polymers made from sugar cane as opposed to petrochemicals and infills that are organic and more durable and the circular economy being a driving force for the industry.

As the community's changing consumption of sport, from traditional sports club provided games such as 11-a-side Football, Rugby Union, Rugby League, Hockey etc., we are witnessing a continued adaption of sport, with Hockey 5's, 5-a-side Football, Rugby 7's, 3 by 3 Basketball amongst others. All of these adapted sports have encouraged the evolution of the sports surface's technology, the designs and multi-use of the fields of play, the management and maintenance of the surface.

Sport plays a far more important role in society than just for training, competition and skill development, it can impact on the physical and mental health of individuals, the economic sustainability of clubs and organisations and the social connectedness of communities. Understanding the trends and shifts in sport

consumption will impact on the planning, design, procurement and management of facilities and environments where people can be active.

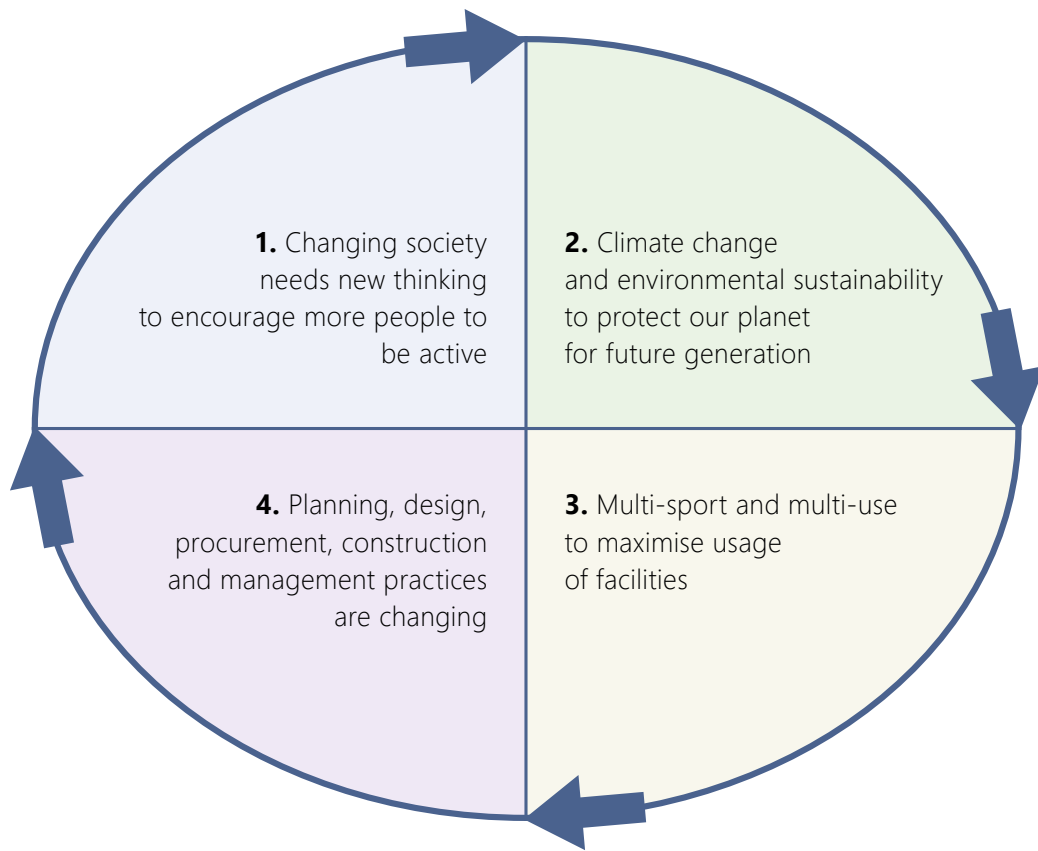
The IAKS Outdoor Sports Surfaces Expert Circle has identified trends that reflect how the industry is embracing future needs, advancing technologies, and evolving community expectations, demonstrating industry leadership around climate change and environmental sustainability.

These future Trends are seen as being part of the "Changing the Narrative" movement for the industry, with stronger benefits, challenges and solutions being seen through a more holistic lens, from a community, environmental and economic perspective.



# CHANGING THE NARRATIVE – KEY TRENDS

As society's consumption of participation changes, so are their concerns and commitment to greater focus on climate change and environmental sustainability. Coupled with the sports surfaces having greater focus on multi-use and multi-sport, the importance of design and procurement has never been more important. The trends include:



# 1. CHANGING SOCIETY NEEDS NEW THINKING TO ENCOURAGE MORE PEOPLE TO BE ACTIVE

## THE ISSUE

The World Health Organisation, amongst others, has identified that predominantly western civilisations are not being active enough to have a health gain. The significant growth in sedentary lifestyles is having an impact on the health of many nations, through increased levels of preventative disease, such as cardio-vascular disease, some cancers and mental health levels.

Play, recreation and sport can encourage more people to be active and reduce the burden of disease, increase community connectedness and improve quality of life to individuals. If facilities and environments are designed and placed in the right environment, they can encourage more people to be more active more often.

Children and adolescents around the world are not moving enough to promote healthy growth and development, and the COVID-19 pandemic only made matters worse, according to a global report by the Active Healthy Kids Global Alliance (AHKGA) who compared 57 countries from six continents to assess global levels and trends in child and adolescent physical activity.

The report revealed that modern lifestyles – increases in digital screen time, the growing urbanisation of communities, and the

rise in automation of previously manual tasks – are contributing to a pervasive yet unequally distributed public health problem that must be recognized as a global priority. The World Health Organization's targets to reduce physical inactivity by 15% by 2030 and all levels of government are looking for solutions to achieve this. Creative and energetic designs for environments can help encourage our young people to be more active, to play and to recreate.

Sport and activity are driven by interest, desire and a will be more active, as part of a more active community (e.g. walking and cycling) or through exercise (play, recreation and sport). To make the activity more attractive, the environment must be easy to access, part of daily life and accessible (e.g. pocket parks, accessible paths and multi-use activity areas).

Innovation of technology both on the surface and with mobile technology is an important factor. Mini-pitch and mini-play-field areas should be linked to the social media of today, so reservation, appointments etc. on these sports areas should be supported by modern electronics, booking or reservation abilities. Some suppliers of recreational equipment include users' smartphones into their product e.g. by game offerings.

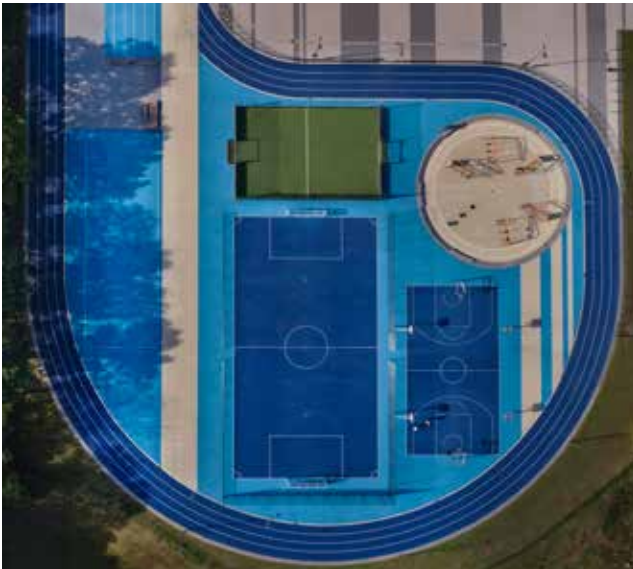




## THE OPPORTUNITY

Increasing opportunities for being physically active at school (active curriculum, extracurricular programs, active breaks) should be on the agenda, as well as encouraging governments to consider providing free access to public spaces, green space, playgrounds, sports facilities, and active transportation linking infrastructures, while addressing the issue of safety of the environment as a priority. Sports surfaces can positively impact on this, through multi-use and multi-sport designs to encourage exercise (e.g. jogging tracks), play (design for all ages), physical literacy (combining sports equipment and surfaces that challenge students), recreation (adaptive sports) and community sport.

Developing and designing spaces and facilities should aim at providing more equitable, accessible, inclusive, flexible, and attractive places. Programmes and opportunities should specifically target at girls, children and adolescents with a disability, from low-income families, and/or facing segregation or marginalization, as well as adolescents to reduce the age-related physical activity decline.



Innovative design of participation environments, which encourage people to exercise, play, recreate and participate in community sport is growing. There is a significant move away from just functional design of traditional sports fields and surfaces. The growth of multi-use activity areas, colourful playground surfaces and exercise spaces has grown globally exponentially over the past decade.

The adaption of community sport with 3 by 3 Basketball, Hockey 5's, 5-a-side Football, Baseball 5's, Rugby 7's amongst others provides an ideal opportunity for sports participation to be used as part of urban regeneration to create pockets of energy around community precincts.

Innovative technology has been created to utilise core sports infrastructure such as football and rugby stadiums for hockey, with temporary elite fields being installed for major events.





## 2. CLIMATE CHANGE AND ENVIRONMENTAL SUSTAINABILITY TO PROTECT OUR PLANET FOR FUTURE GENERATIONS

### THE ISSUE

As the community become more knowledgeable and protective of their environment, they place greater accountability on the owners, planners, designers, and managers of open space. Their expectations of good governance recognising the challenges of climate change, while expecting long term custodianship for future generations now need to be embraced by sport, governments and educational establishments. Community groups that are comfortable about speaking out may not always have the accurate information about the technology, but their perceived issues means that as an industry we need to be more articulate about the benefits and environmental good practice that is being embraced by the innovations and technology that we are seeing being developed.

Many times, the targeting of the sports surface technology may be seen as being unfair, as the sports surfaces take up less than 1% of the cities surface area, and seem to be an easier target than the urban sprawl of increased roads, houses and commercial spaces.

Under the circumstances of growing cities and more pressure on saving passive and active landscape spaces, synthetic sports surfaces gain more and more importance, by focusing the intensity of use in a focal area and reducing the need to convert passive space to active space to cope with the demands. These sports areas allow with minimum space consumption a maximum of availability and usage times (if planned and serviced correctly). They contribute directly to less land usage and environmental savings.





### THE OPPORTUNITY

Embracing community concerns on climate change and environmental sustainability in the design of sports fields and multi-use activity areas will allow the industry to learn from the construction and landscaping industries. This could include:

- Water harvesting to irrigate surrounding trees and natural turf
- Tree canopy expansion around playing environments and organic infill to reduce heat impacts
- Use of "green concrete" for paths and infrastructure

Recycled material used for pavement base, shockpad and ancillary products, e.g. technologies which process existing insitu e-layers in place to re-granulate them after over 35 years and install them on site again will provide another 30 years of performance for the sports area.

There is a move to new systems being developed that are embracing environmental best practice, such as:

- Non-filled sports surfaces (some only using sand)
- Organic infill surfaces for sports fields
- Using bio-based polymers as apposed to traditional petrochemical polymers
- Transitioning from water based hockey fields to "waterless" fields

Circular economy encourages "end to end" thinking around reducing the carbon footprint of the facilities, including:

- Recycled material – used in the construction phases of the pavement, shockpad, infill and ancillary products (e.g. recycled concrete, fencing, seats, etc.)
- Reuse – development of more durable products that can withstand the intensity of usage, including two or three cycles of the shockpad/e-layer; reuse the pavement for 30 years, reuse of the infill (sand and organic) in the parks once the carpet is uplifted
- Recyclable – to ensure that any component of the surface system can be 100% recycled into formats that can be made into the original raw material or complementary products (e.g. recycled plastic park seats)

Embracing environmental standards – to ensure safety and health of the fields including standards on microplastics, heavy metals, sports surfaces, shockpads, construction techniques etc.

Synthetic sports surfaces need to be "fit for purpose" and aligned with how they are going to be used, by whom, the frequency of use (hours and number of people) and the level of sport. This will impact on the scope, durability and quality needed for a specific surface. There is no such surface that fits every need. Engaging specialists and independent help will guide through the decision making process.





### 3. MULTI-SPORT AND MULTI-USE TO MAXIMISE USAGE OF FACILITIES



#### THE ISSUE

With the expanding metropolis around many cities globally the availability of active land and open space is reducing significantly per head of population. The use of limited space for multi-purpose is needed, allowing many activities to be played on the same surface and flexibility for stadia to be used for many different sports and activities.

Modelling was then performed in conjunction with Aurecon to demonstrate that the inclusion of the skylights could provide the daylight factor of greater than 2% for 45% of all spaces within the building earning the project additional green star credits. The result is an upper floor which embraces the light as it tracks through the sky creating interesting moments throughout the building as light and shadow energise key spaces.





## THE OPPORTUNITY

Technology development is allowing multi-use for different sports, including FIH's GEN 2 Surface that meets the standards for Hockey, Hockey 5's, Netball, Tennis, 5-a-side Football as well as adapted sports and fitness training.

The multi-use philosophy should consider who the surface is being designed for, and if the majority of the field is for children's use the design should be for them, with mini-fields, games areas and skills boxes. The default design shouldn't always start with full size fields that have to be certified.

The OneTurf Concept where the major football codes can all play on the same turf including Soccer, Rugby League, Rugby Union etc., can be adapted for needs in each global region.



The seasonality of the facility should be considered to embrace additional usage. In winter in Europe a field can be "flooded" and turned into a skating rink, while in summer it can be used as the 3G football field. In the southern hemisphere, winter use can include various football codes, and summer use Cricket, Touch Football, Rugby 7's, 5-a-side Football etc.

Multi-use designs allow for adaptive sports and traditional sports to co-exist on one playing surface, thus encouraging a broader community to participate socially as well as competitively.

Technology allows participation at different levels from social, to recreational to developmental to be embraced on a single surface.

Portable technology may allow surface to be placed in a different sports stadium, such as Hockey in a Rugby Stadium, or athletics in a Football stadium.



## 4. PLANNING, DESIGN, PROCUREMENT, CONSTRUCTION AND MANAGEMENT PRACTICES ARE CHANGING

### THE SOLUTION

To reflect the changing trends the industry is evolving the way it plans, designs, procures, constructs, and manages the facilities for people to be active on the sports surface.

The IAKS Expert Circle Outdoor Sports Surfaces believes that if purchasers and managers of such facilities and environments embrace the trends and follow the four-stage approach below, the outcomes and impacts for the users, the environment and the broader community will be significantly increased.

### Stage 1: Planning

- Ensure multi-sport and multi-use in the planning, to maximise usage and open the usage to greatest community participation, planning for usage during all of the daylight hours as well as peak time in the evenings.
- Planning should align the facility and environment in a manner that it encourages accessibility to all cohorts of the community, as well as greatest patronage, both with formal and informal usage.
- Embrace community concerns regarding environmental management, player safety, health of the community in the design process in a way that the planning for the field is scoped initially and reflected in community and stakeholder consultation.
- A whole of site plan should be considered when planning, to reflect environmental and landscape consideration (e.g. water harvesting, tree canopy), transport (e.g. vehicle and pedestrian), built infrastructure (e.g. paths, parking, lights, toilets and pavilions etc.) to ensure a better outcome for the community.
- Planning the scope of the project should consider the "whole of life" considerations for the surface (e.g. construction, maintenance and replacement lifecycle stages).



### Stage 2: Design

- Embrace designs that allow for multi-sports to be played on the field of play as well as including adaptive sports (5-a-side Football, Hockey 5's, Rugby 7's etc.).
- Environmental design to minimise impact on local landscape should consider microplastic migration minimisation, reduction in heat, water harvesting, extending tree canopy, retaining top soil on site, use of green concrete, use of recycled products to construct the field of play and ancillary equipment.
- Design should be for a minimum of 30 years to ensure sustainability of the field, drainage strategy and impact on local landscape.
- Design to minimise carbon footprint for the site, where possible and impact on maintenance longer term.
- The design should be focused on the intensity of use and the durability needs for the site.



### Stage 3: Procurement and Construction

- Procurement scope to include policy and strategies from tenders that demonstrate that they are committed to positively impacting environmental footprint, both with the performance surface (e.g. organic infill) and the constructed pavement with the use or recycled material for the pavement, drainage and ancillaries etc.
- With good leadership from all levels of government we are seeing the emphasis is shift away from the lowest cost winning tenders to a "whole of life" cost that also embraces the social value sport has on children and sedentary lifestyles, as well as the environmental value of protecting the planet for future generations.
- The procurement should focus on end of life expectations regarding reuse (e.g. shockpad), recycle (e.g. turf carpet) and repurpose (e.g. sand infill).
- Construction and sports surface standards should be fit for purpose.
- Recognise logistical challenges globally, and carbon footprint implications encouragement of sourcing locally within region encouraged
- Engaging companies that have significant experience in the design and construction of the fields of play should be a priority which will provide a quality assurance against local challenges such as shortage of qualified staff.



### Stage 4: Management and Maintenance

- Planned maintenance should be the responsibility of the hirers and the owners for the facility, based around the hours of usage, to ensure that the field can achieve its life expectancy.
- Management of the field usage should ensure that it doesn't always focus repetitive drills in one area, or training nearest the entrance gate.
- Embrace technology that can monitor the usage levels on the field while linking that to the maintenance program.
- Maintenance is different for each of the various systems (eg. Monofilament, tape or dual your systems) and also for the infill type (rubber, organic or performance free) - so engage specialists who appreciate the difference.



# INNOVATION ENVIRONMENT SUSTAINABILITY



## IAKS - Who we are

The IAKS is the leading global non-profit organisation for professionals from the sports, leisure and recreation facilities industry. Since 1965, IAKS has been enabling international networking for the exchange of expertise in the fields of architecture, construction and operations. IAKS is an IOC Recognized Organisation and cooperates with the IPC and many more international non-profit bodies.

Our network is the meeting place for architects, engineers, clients, designers, local authorities, technical and operative management, sports federations and clubs!

IAKS has partners and members in 153 countries. National sections serve local interests, organise regional and own events and provide information to the members of their countries.

You're enthusiastic about high-quality, functional and sustainable sports facilities? You appreciate cross-sector exchange among experts? You're looking for or can provide forward-looking information on the architecture, construction and operation of sports and leisure facilities? If so, you'll feel at home in the international IAKS network: for inspiration, solutions and a global forum.

## IAKS Expert Circle Outdoor Sports Surfaces

The IAKS Expert Circle is committed to championing and advocating for sustainable, safe and quality sports surfaces that can be used to encourage more people to be active, play, recreate and participate in community and elite sport.

### Expert Circle Members

Bjorn Aas, Dennis Andersen, Dr Ulrich Berghaus, Nikolai Chrastka, Alastair Cox, Stefan Diderich, Matthias Eiles, Leonor Gallardo Guerrero, Jorge Fernando Garcia Unanue, Björn Hammel, Jarrod Hill, Peter Kaak, Øyvind Trygge Moltubakk, Walter Müller, Jorge Muntanola Sanz, Josep Roger, Niklaus Schwarz, Carlos Ruben Segura, Florian Szeywerth, Friedemann Söll, Douglas Wournell.

### Expert Circle Chair

Martin Sheppard

# MULTI-USE TECHNOLOGY ACTIVITY FUTURE GENERATION