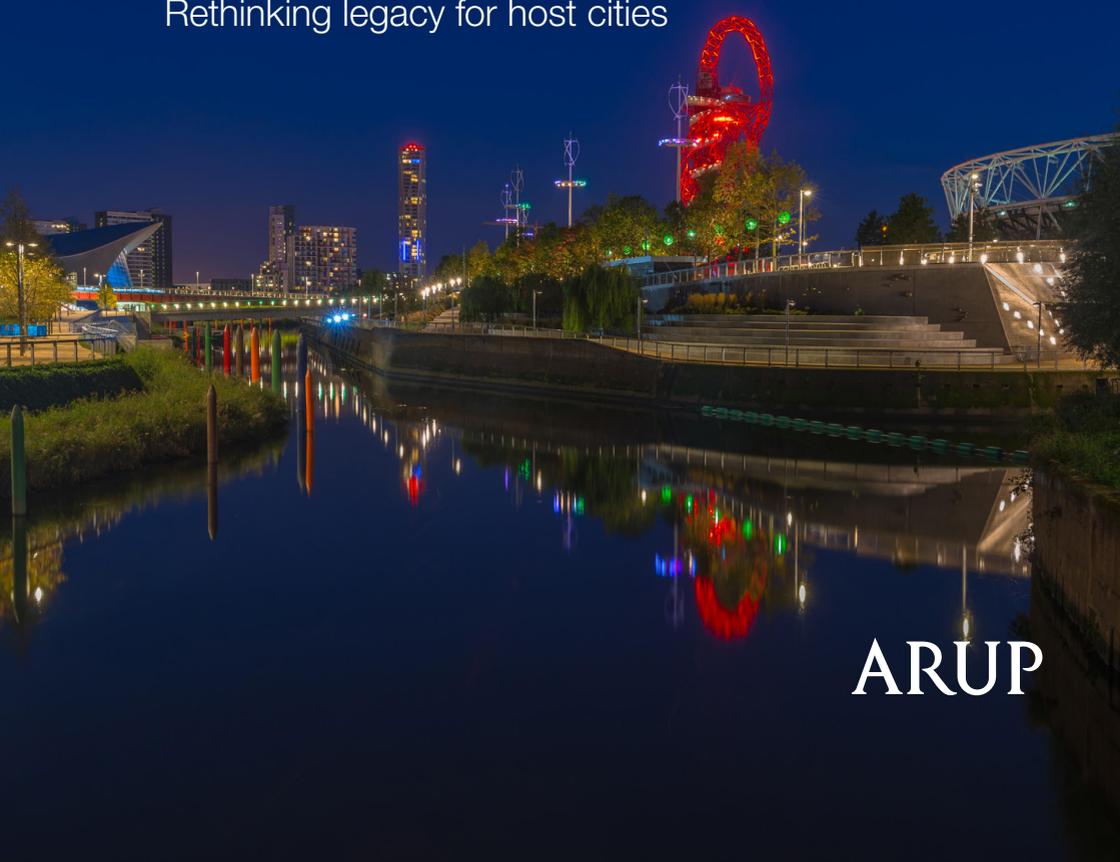


Cities Alive

Rethinking legacy for host cities



ARUP

This publication is the product of collaboration across Arup's host cities team, a group of specialists that supports cities, bid committees and organising committees across the globe through the feasibility, bid, delivery and legacy stages of their events. The team brings together a range of city planners, designers, consultants and engineers with a focus on accelerating transformational change to create real prosperity and a lasting legacy for future generations. As trusted advisors working closely with city governments, mayors and stakeholders, the team brings a breadth of knowledge and understanding to create new ideas, deliver ultimate success in hosting major events and embed meaningful change as a legacy.

The report draws on our experience from major events around the world including the Olympic & Paralympic Games, World Cups, Expos and Commonwealth Games. It also discusses our own analysis of how future events could deliver even greater transformational change in cities, as a result of being a 'host city'.

Released September 2017

 #hostcities

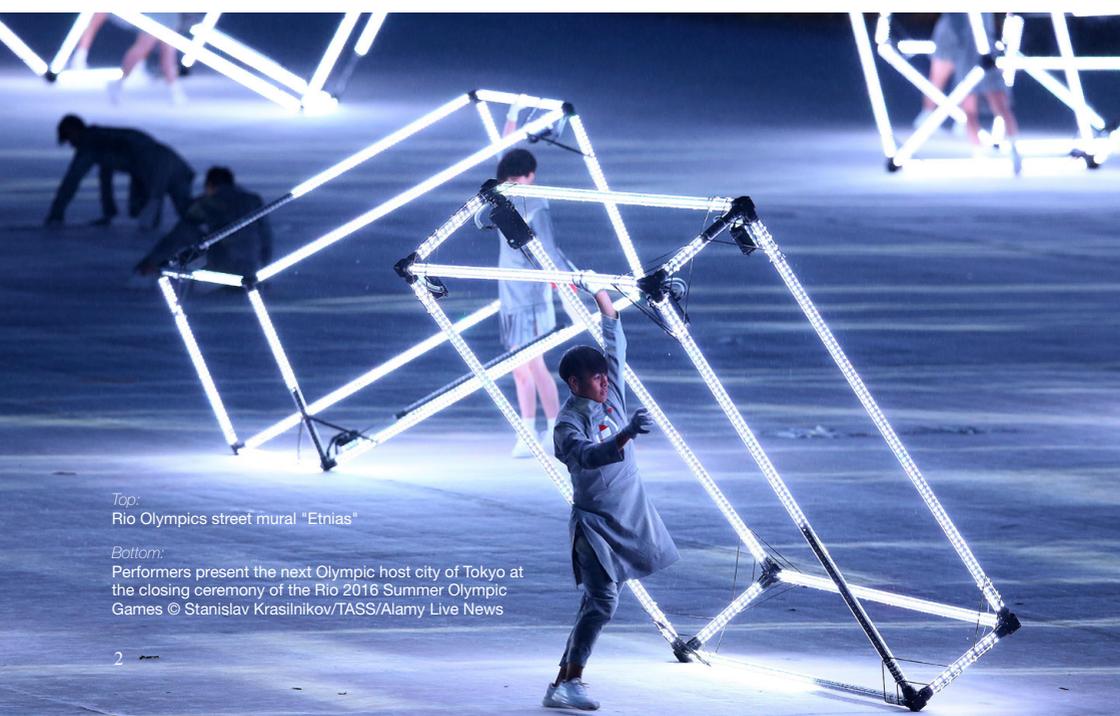
ARUP

13 Fitzroy Street
London W1T 4BQ
arup.com
arup.com/citiesalive
© Arup 2017

Cover Image:
After the event, Queen Elizabeth
Olympic Park Stratford © Alamy

Contents

- 3 Foreword
- 4 A new era for host cities
- 6 Reimagining legacy
 - 8 Urban overlay
 - 10 Operational excellence
 - 12 Cleaner and greener infrastructure
- 14 New approaches to optimising cost
 - 16 Financing events differently
 - 17 Optimising venue use
 - 18 Reduced capacities and temporary venues
 - 20 The alternative digital experience
- 22 The new live site
- 24 Delivering a legacy of institutional capacity



Top:
Rio Olympics street mural "Etnias"

Bottom:
Performers present the next Olympic host city of Tokyo at the closing ceremony of the Rio 2016 Summer Olympic Games © Stanislav Krasilnikov/TASS/Alamy Live News

Foreword



Jerome Frost
Global Cities Leader, Arup

If current sceptical trends in the views of urban citizens continue, we will see more and more people abandoning their support for major events. In the age of social media this could happen at an alarming rate.

In an era of austerity and uncertainty many would say this does not matter, there are far bigger issues to worry about. But it does matter. Major events such as the Olympic and Paralympic Games, Commonwealth Games and pan-region competitions are more relevant than they have ever been. For cities hosting these high profile events they should represent the very confidence in our urban futures that we need to pull us out of challenging times. They go beyond the displays of human endeavour and the expressions of multi-cultural unity, of open-mindedness, acceptance and cooperation. Their successful delivery has the power to re-invent the image of a country, accelerate investment and transform cities at a 100 metre pace.

As London has found out since 2012, no amount of ‘business-as-usual’ city planning, promotion and design ambition can replicate the supercharged effect of placing a city in the spotlight of 5bn people and doing it well.

To deliver this potential it is ever more imperative that these events are seen as being primarily for the hosts’ and their citizens’ benefit. They should be adapted to align perfectly with the longer-term ambitions of host cities and nations. Events should focus on development aligned with a city’s growth ambitions, event ‘deals’ that, early on, set out the investment and long term relationships expected in return for hosting, the deployment of demountable, re-useable venues and greater use of digital and personalised event environments. In this context they can be presented to host citizens as accelerants to pre-existing ambitions and expressions of their hosts’ confidence and clarity of purpose.

Our aim is to ensure that by adopting this approach, a host city can be assured that their event propositions are delivering maximum long term private investment, value for public money and, most importantly, popular support from their citizens.

A new era for Host Cities

Both Los Angeles and Paris 2024 Olympic Games bids represent the new era of hosting major events. Aligned with the International Olympic Committee (IOC) Agenda 2020, both are dominated by the use of existing or temporary venues, maximising efficiency, minimising costs and dramatically reducing the risk of unused venues post-Games.

This new direction should be the perfect antidote to the populist fuelled opposition that has led to so many cities stepping back from recent major event bidding competitions.

And yet, the approach creates a new challenge for host cities – the risk of no tangible legacy at all. In this context, despite sizable reductions in costs, any price may seem too much to citizens who struggle to see any wider benefits beyond the six weeks of events and celebration.

Thus, to rebuild popular support in major events, post-2020 host cities must reinvent ‘legacy’. Without the typical range of physical assets available to previous Games legacies they must instead turn to dramatically extending the benefits derived from the event. These benefits might include increased civic engagement through volunteer programmes and better public information; a wider audience engaged through personalised event experiences using digital technology and social media; more efficient organisational models used to manage the city; a shift towards more sustainable behaviour; and capitalising on long term infrastructure investment.

Overleaf:

Paris celebrates Olympism: Paris is more mobilised than ever around its candidacy to host the Olympic and Paralympic Games and organised two days in June 2017 where the heart of Paris transformed itself into an ephemeral Olympic park.

© Julien Mattia / Le Pictorium



Reimagining Legacy



The most powerful effect of a major event on a host city is the way in which it can positively change the behaviours of residents, businesses, government agencies and investors.

In the legacy success stories of Barcelona, Sydney, Beijing and London it has been the Games-induced revival of business confidence, re-engagement of local communities and restoration of trust in city leadership that has led to transformational changes for those cities.

These benefits are often masked by the more tangible physical legacies of Olympic Parks, stadia or villages. In the absence of these physical assets post-2020, hosts must focus more overtly on these behavioural legacies if the ‘memory’ of the Games is to be engaged in transforming their cities.

From recent Arup-led research we have highlighted three tactics that are likely to have greatest impact in achieving this:

- 1 ‘Urban overlay’: mapping the city’s ambitions and accelerating change through its neighbourhoods and streets.
- 2 Operational excellence: transforming city management and embedding highly efficient Games time organisational models to increase future resilience.
- 3 Cleaner and greener infrastructure: inspiring and accelerating action to tackle climate change by developing hard and soft ‘climate-ready’ infrastructure



Overleaf: London Eye at night - Olympic 2012 Host City © Alamy
Above: Beijing Central Business District post 2008 © Alamy

Urban overlay

Mapping the city's ambition

What is 'urban overlay'?

Taking the principles engrained in traditional event design and combining them with Arup expertise in city planning, economics and infrastructure delivery, we have developed the 'urban overlay' methodology.

At its heart the approach takes the event as an accelerant in realising a city's longer-term ambitions. In the same way that overlay design is used to create the 'look and feel' of an event, the event itself is used to create the 'look, feel and function' of the future city.

Thinking long term

Overlay techniques have come a long way from their 'stage set' origins. They now include a range of complex structures, streets, projections, soundscapes, re-routed and temporary utilities, all designed to curate the event experience, whilst providing optimal operational environments, security and back-up resilience.

Through the use of long-term overlay, coupled with the careful location of live sites and incidental event-themed cultural activities, a city can bring alive rundown neighbourhoods, demonstrate the development potential of new districts, reenergise open spaces and reimagine stations, airports and the public realm.

Using these same techniques in the urban environment both for the event and extending into its legacy can enable the transformation of places well ahead of their permanent form. For example, a corridor alongside a newly completed metro line can be brought alive, and neighbourhoods in decline can be reenergised around reimagined, revitalised public spaces.

Below left: Toronto 2015 - PanaMania, a constant party celebrating the 2015 PanAm games ©Alamy

Below right: Up and Away Sydney Vivid Festival 2012 ©Arup

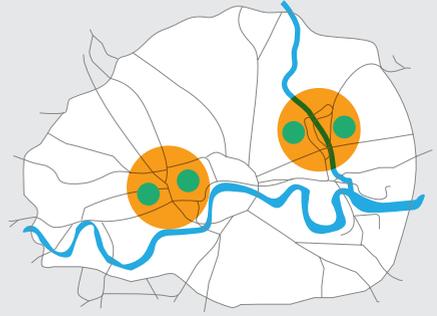


Local Live Sites

'Live Sites' are an integral part of major events, allowing people without tickets the opportunity to feel close to events. Citizens can watch on big screens and be part of the shared experience. Unlike the current Olympic model, Live Sites could be placed all around the city, bringing the sporting events to each neighbourhood and closer to its citizens. This has two benefits, it takes the strain off the transport system, as fewer spectators are travelling to the competition venues and in many cases would be able to walk to their local Live Site, encouraging active travel.

The other equally important benefit is that the Games will be seen to be more inclusive, part of every citizen's experience; a renewed democratising of the event. Cities around the country could also host live sites, further expanding the experience for all.

Typical games masterplan



Neighbourhood venue masterplan



Below left: Park Live London 2012 ©Arup
Below right: Queen Elizabeth Olympic Park London 2012 ©Arup



Operational excellence

Transforming city management

The greatest single risk to the successful legacy of a major event is the potential disruption it can bring to the daily life of the host city. A major event presents a shock that will test a city's resilience. The citizens and businesses that could suffer excessive congestion, spikes in poor air quality, interrupted services and delayed deliveries are the most likely to drive mass social media opposition to the event and its legacy.

London's exemplary operation during the 2012 Olympic Games is still referred to by locals as a 'golden' glimpse of how smooth life could be in an efficiently run city. The Olympic period triggered more rail journeys, greater use of journey apps and the adoption of the most efficient logistics management systems the city had ever experienced.

The adoption of new technologies, coupled with a greater understanding of the power and value of efficient operations means the potential for a legacy of operational excellence is far more possible in the post 2020 era. For example, in the Los Angeles context the effect could be dramatic, delivering a modal shift from car to public transport, localising services, transforming inter-city coordination and creating a legacy of efficient civil defence and community engagement. London created a legacy for event management; Los Angeles has the opportunity to transform city management.

Overleaf

Top left: London 2012 Olympic games lanes

Top right: Olympic Park station © OCS

Centre: Thinking Space - Sheffield City Council's Urban Transport Centre © Arup

Bottom left: London Underground in operation

Bottom right: London 2012 official Olympic BMW cars on Whitehall, London.



Cleaner and greener infrastructure

Catalysing climate action through hard and soft infrastructure

The new era of hosting major events post-2020 will bring greater definition to the sustainability agenda. Events of the past have focussed on direct event-related sustainability outcomes such as construction and operational waste, reduced energy and water use and low carbon materials. Whilst these elements remain important, an event that utilises more of the existing infrastructure will have a greater long term impact on city-wide resilience, sustainability, climate change and air quality.

The most effective host cities will have already identified their pan-city environmental priorities. A big event brings the opportunity to scale up and accelerate these ambitions through:

- Consumer awareness campaigns
- Low emission zones
- New metro lines
- Modal shift from car to public transport
- Electric transportation
- New temporary/permanent sources of energy
- City-wide resilience planning and systems
- Localised energy, cooling and water systems
- Reprogrammed waste collection/sorting mechanisms
- Flood protection/retention
- City amenity/breathing space.

So a planned metro line could be accelerated and a modal shift induced through Games coordination. City resilience proposals could be delivered as a legacy of Games operations requirements. Air quality zones could be introduced around venues and Live Sites to encourage the shift to non-polluting forms of travel.

Overleaf

Top: Stratford tube, rail and DLR station in London, busy during and after the 2012 Olympics in the adjacent park

Centre: Joggers, cyclists and families all benefit from green infrastructure surrounding Queen Elizabeth Park, London

Bottom: Transport Modal Shift - Los Angeles Metro gears up for 2028



New approaches to optimising cost



All major event organisers are searching for new tactics and tools to make their Games more affordable, such as extending event schedules so that some sporting events could start sooner to free up the venue for a follow-on sport. Another option would be reducing venue capacity requirements. These two initiatives could have a hugely positive impact on the cost of the Games and legacy benefits.

To achieve this new direction, hosts, organisers and their advisors will need to deploy a range of new tools and tactics.

At Arup we have been focusing on a number of approaches, which include:

- 1 Financing events differently
- 2 Optimising venue use
- 3 Reducing capacities and using temporary venues
- 4 The alternative digital experience



Overleaf: The temporary structure of the London 2012 Olympic basketball arena. The arena was designed to be fully recyclable © CC Alexander Baxevanis

Above: London 2012 riverbank arena. © CC EG Focus

Financing events differently

Aligning with a city's strategic plan

There has been a recent trend in citizens showing their reluctance for their city to host a major event. Issues pertaining to cost, security, new priorities for public funds and ongoing questions around legacy benefits are driving this reluctance, manifested in popular referenda where citizens have explicitly rejected the idea of hosting.

And yet, cities need infrastructure development to maintain and grow their economic productivity. Infrastructure investment therefore usually lies at the heart of a city's strategic plan. With cost, sources of funding and speed of delivery all critical concerns, major events can both accelerate infrastructure delivery, and provide momentum for deal-making to forward fund major infrastructure.

Value capture techniques can be applied to major projects, which when used alongside the momentum of a major event to accelerate delivery, becomes an attractive proposition for a city's economic growth.

Offsetting the costs of major events compared to 'business as usual' spending can also shed light on the real costs of hosting. In London for example, a significant proportion of costs were related to infrastructure, land acquisition and remediation that needed to happen at some point, regardless of whether the city hosted the Olympic Games or not. However, it is arguable whether this would have happened in such a coherent and effective way without the 'Olympic effect'.

Below: AAMI Park Stadium Melbourne © John Gollings



Optimising venue use

Strategic digital dashboard

Arup is developing a strategic digital dashboard for cities planning to host major events. Our extensive experience in event planning and city making is being used to design a tool that will draw upon a wide pool of data to provide rapid insight for host cities who need to make decisions about the form and nature of their unique major event.

The dashboard will have numerous data parameters allowing us to evaluate what the consequences would be if, for instance, the preliminary rounds of a certain sport began a few days early, as it does with football; or what the consequences would be of reducing the venue's capacity, either by using a temporary venue or a smaller existing venue.



Above: Venue optimisation dashboard concept ©Arup

Reducing capacities and using temporary venues

[Speed of delivery and transition to legacy](#)

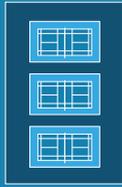


Reduced venue capacity requirements are where real savings start to materialise, and affordable off-the-shelf or pre-engineered venues become a realistic proposition. Apart from a few of the larger venues, such as the main stadium, it is conceivable that almost all major events could in the future use either temporary or existing venues. One of the big advantages of temporary venues is the speed at which land can be released for redevelopment after a major event. They are faster and cheaper to erect and mitigate the risk of post event ‘white elephants’. Scaling down venue capacities means reduced

spectator numbers and ticket based revenues; ticket revenue is a key part of any major event so this would need to be mitigated through other forms of associated event revenue. Fair and equal access to tickets also continues to be live issue. Improving online systems and using space more effectively for sponsors, organising members, media and spectating athletes can help create smaller but fuller venues. And from an athlete and spectator point of view, smaller venues generally result in a packed house and a great atmosphere.



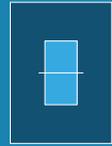
Sport
Capacity
Court Dimensions
Auxiliary Area
Dimensions



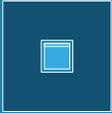
Badminton
6,000
6.1x13.4
46x30



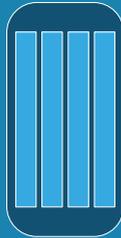
Basketball
15,000
28x16
38x26



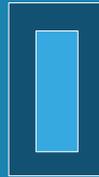
Beach Volleyball
12,000
16x8
36x26



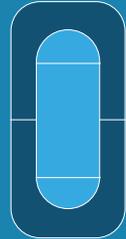
Boxing
6,000
6.1x6.1
28x28



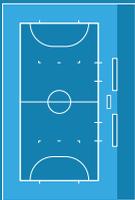
Curling
3,000
44.5x4.75
60x30



Fencing
4,000
30x10
44x24



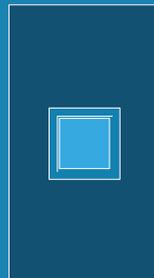
**Figure Skating /
Short Track**
12,000
60x30
60x30



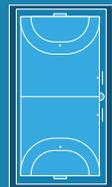
Football
12,000
40x20
50x35



**Gymnastics
Artistic /Trampoline**
12,000
Various
70x40



**Gymnastics
Rythmic**
5,000
13x13
70x40



Handball
10,000
40x20
46x26

The alternative digital experience

More immersive environments, increased participation

While nothing compares with attending a live event, the emergence of virtual reality and digital, hand-held technology has allowed us to capture some of that atmosphere and excitement in ways that were simply not possible in the past.

Digital and virtual event environments are becoming more common, and for the first time virtual reality technology was used at the Rio Olympic Games. Although not quite at the point where sports fans could put on headsets and enter Olympic venues, it gave a glimpse of potential future use.

With the huge uptake in eGames and the use of VR devices such as Oculus Rift, a shift to viewing sport in virtual reality environments is a huge opportunity for major events to increase spectator participation and boost the numbers that might be lost due to reduced venue capacities.

Overleaf

Top: Promotion event held in 2016 to promote Tokyo 2020 Live Sites. The Live Sites will be held as an official program of the Olympic and Paralympic Games. At the Live Sites, visitors will be able to view exciting live broadcasts shown on a jumbo screen outside competition venues, enjoy stage events, and experience Olympic/Paralympic sports on a trial basis.
© Shingo Ito/AFLO/Alamy Live News

Bottom: Virtual Venue Concept sketch © Arup



The future Live Site

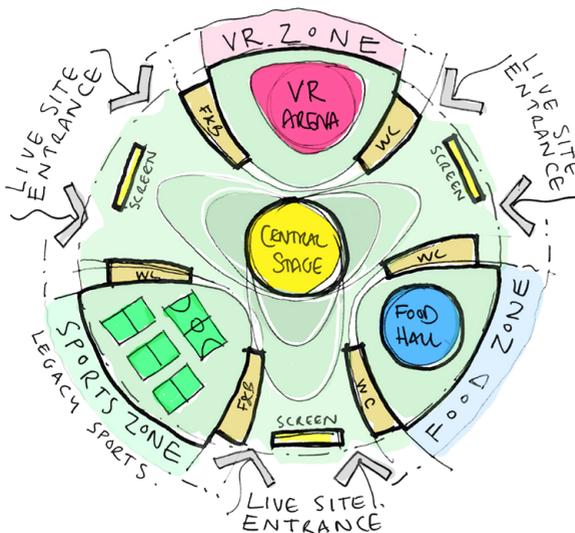
Inspiring the community

The Live Sites of London 2012 provided the opportunity for a larger community to be part of the Olympic experience in an immersive and exciting atmosphere. As digital technology advances the experience in Live Sites will only improve offering far more than giant screens with food and beverage concessions.

The future Live Sites could offer virtual reality environments that allow spectators to tune into any number of live sports, get guided tours of venues or listen to their favourite athlete being interviewed. With free, or cheaper,

entrance fees than competition venues, Live Sites could be highly accessible to families and youngsters.

Another feature of Live Sites should be to inspire the community to develop sporting skills and a habit of regular exercise. Programmes such as 'Have a Go' sports coaching were introduced at some London Live Sites. For these to have a real impact and lasting legacy, these sites should inherit new and better sporting facilities with a long-term commitment to coaching and maintenance and become a feature in neighbourhood life.



Left:
Live Site concept sketch © Arup

Overleaf
Top: Crowds enjoy the action on the giant screen at Live Site East in the Olympic Park, London 2012 © CC Department for Culture, Media & Sport

Bottom: Live Site concept sketch © Arup



Delivering a legacy of institutional capacity

Embedding urban overlay, operational excellence and clean and green infrastructure principles into the delivery plan for a major event goes a long way to guaranteeing a transformation for the city. But long term success comes from the building of institutional capacity to deliver benefits before, during and after the event.

Too often this delivery capacity is lost post-Games and the city reverts to normal operations and frustrations. For example, London largely decommissioned their integrated transport control centre after the Games, arguably reducing institutional capacity and resilience. Inevitably, with events on a global scale occurring relatively infrequently every host city tends to start the planning process from a level of relative inexperience. Whilst there are a number of international experts available to advise on the delivery and operations of the event, there are few that can focus on building the capacity to convert the event into a legacy for a city and its people.

Arup has developed a ‘coaching’ style approach to working with its city clients. Through our network of clients, former city officials, former city leaders and technical experts we aim to help clients build capacity of their own through a trusted, confidante and empathetic relationship. We don’t presume to know better, instead we aim to help our clients build their own expertise, confidence and long term delivery capacity.

Our aim is to ensure that our host city clients deliver maximum long-term private investment, value for public money and, most importantly gain their citizens’ support.

Overleaf

During a major event, cities need to coordinate across a huge variety of operations centres for the city to still run smoothly. This model brings various departments and control centres together that do not usually ‘talk’ in such an integrated way. Extending this model can embed highly efficient city management beyond the Games period ©

Arup



Cities Alive

Cities Alive is a thought-provoking global research series which explores the social, technological, environmental, economic and political drivers shaping future cities across the globe. It takes a human-centred approach to rethinking how we should design and manage cities in the future.

Cities Alive: Rethinking green infrastructure explores how we can design nature into urban systems at all scales via new development and retrofitting. It shows how the creation of a linked ‘city ecosystem’ that encompasses green corridors, city streets, squares, plazas and parkland can help create a healthier, safer and more prosperous city.

Cities Alive: Rethinking the shades of night looks at the role of light in creating human-centred urban environments at night time. The report emphasises a more context-sensitive design approach and a holistic integration of lighting infrastructure into the urban fabric.

Cities Alive: Towards a walking world highlights the significant social, economic, environmental and political benefits of walking. Informed by specialist insight and expertise across our global offices, the report highlights 50 benefits of walking explored through 16 distinct indicative themes, and list 40 actions that city leaders can consider to inform walking policy, strategy and design, supported by 80 international case studies to inspire action.

Cities Alive: green building envelope considers the role of building facades in contributing to a city’s sustainability and quality of life. It explores how the entire building ‘envelope’ can provide the dense inner city with surfaces for effective green infrastructure, helping to combat urban challenges such as heat islands, air pollution and noise, leading to more sustainable city micro-climates and building operations.

www.arup.com/citiesalive

foresight

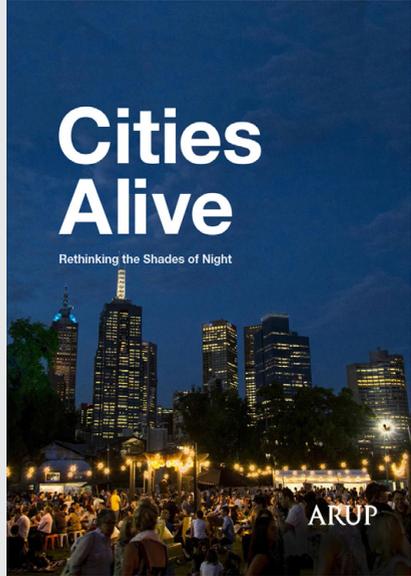
Cities Alive

Rethinking green infrastructure

ARUP

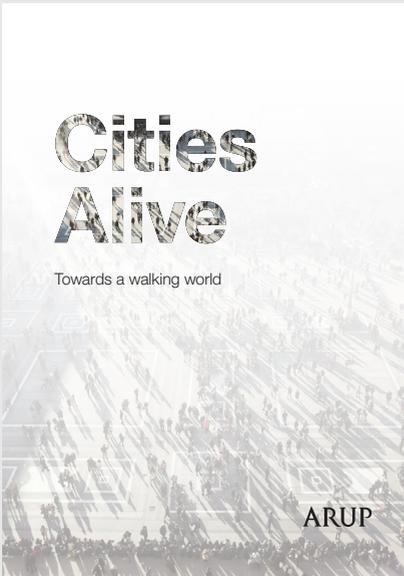
Cities Alive

Rethinking the Shades of Night



Cities Alive

Towards a walking world



Cities Alive

Green Building Envelope



Acknowledgements

Contributors:

Jerome Frost
Nick Merridew
Will Goode
Joanna Rowelle
Eugene Uys
Maria Canovas
Ana Loreto Vasquez
Penny Hall

Communications

Sarah White

Graphic design

Ian Cooper



Major sporting and leisure events are under scrutiny like never before to deliver long term benefits for their host city, and the citizens within them.

Arup is rethinking legacy. As a firm with a long history of the development and design of major sporting venues across the world, we've conducted a study into the changing nature of successful legacy. From venue optimisation, through to innovative finance models securing long term investment, we believe there are new ways to help cities achieve long term value and increased civic engagement through hosting.

This publication draws on our experience from major events around the world and our analysis of how future events can be planned and designed to deliver even greater transformational benefits to their 'host cities'.

Further Information

Jerome Frost

jerome.frost@arup.com

+44 20 7755 4214

Nick Merridew

nick.merridew@arup.com

+44 19 1238 7465