This handbook is WWF’s tool to inspire the transformation of cities around the world into collaborative leaders in social progress within ecological boundaries.

It outlines the global context of old risks as well as new mandates, presenting the opportunity for international partnership on urban solutions, and it summarises learning cases from around the world. The handbook is for all actors who work with cities and sustainability, and aims to initiate debate and learning in order to help cities of the global North and South achieve shared leadership of the next generation of sustainability action.

This handbook builds on previous Urban Solutions reports, and is intended as a reliable tool to be used by, and developed in collaboration with, national and city-level partners in the coming years. It is also an introduction to and summary of the issues for all interested readers.

Cities are centers of dynamic change. They face huge challenges, yet also offer great opportunities and solutions

- Cities are centers of the fastest and largest transformations in population, consumption, resource use, and waste.
- Cities have the richest opportunities to accelerate positive change by their planning of spatial structure, connected infrastructure, and organizational and social dynamics, and by the possibility for scale in effecting solutions.

Cities are important actors in the transition toward a low-carbon and sustainable future

- Cities lead the way with innovative policies and action when it comes to low-carbon solutions. To fully unleash their potential, cities need a supportive environment that enables them to more easily achieve their goals.
- Cities have massive leverage to reduce society’s ecological footprints. Their choices around energy, transportation, and building standards, affect huge numbers of people.
- Cities can directly improve quality of life while reducing environmental impact. Cities can offer options for smarter choices within energy, housing, transport, food, green space, water, and waste.

Sustainable mobility is key to the transformation to a One Planet Future

- Mobility and accessibility are key areas for delivering solutions for a climate-resilient future, built on 100 percent renewable energy, and for the creation of attractive, sustainable cities, based on health, equality, and improved life quality.

Cities around the globe can share leadership for global sustainability

- Cities can serve as powerful examples that others can learn from. By sharing experiences that acknowledge similar contexts – and recognize different challenges – cities around the world can accelerate their own sustainability initiatives.
- By recognizing their own capacity, and amplifying it through partnerships, cities around the globe can share leadership for global sustainability.
- The majority of future urban growth will take place in medium-sized, fast-growing cities. Sharing best practices with these fast-growing cities is vital.

Cities are hotspots for the development and implementation of transformative solutions for a One Planet Future. And we’re all a part of the solution.
In this handbook WWF highlights cities from all over the world taking a lead in work towards a sustainable future. The cases are presented in longer Profile and shorter Snapshot learning cases. These learning cases provide real-life examples of urban-level actions to create a more sustainable, climate-friendly future.

Unless otherwise indicated, the source of data for these cases can be accessed at the Urban Solutions for a Living Planet web site. Here, WWF has studied and catalogued real examples of how cities are approaching the need to minimize their ecological footprints and protect ecosystem services and biodiversity, using 13 vital themes for meeting human needs within the limit of our one living planet. The linkages between the UN Sustainable Development Goals (SDGs) and the WWF Urban Solutions themes are summarised at the centerfold of the report.

The inspiring examples provided by these learning cases highlight exactly how cities are working, in real life and in real time, to reduce their footprints and protect biodiversity and ecosystem services, supporting the SDGs at the urban level.

For more information on each case, please visit wwf.panda.org/urbansolutions.
THE GLOBAL CONTEXT

Global environmental change

Living in a time of change and progress

Human society is experiencing one of the most intense periods of change in history. Demographics, political structures, industrial and economic models are all being transformed. Populations are converging on cities where lifestyles and workstyles are being dramatically reinvented through computer and communications technology.

Much of this change is positive, for the poorer communities – and sometimes the poorest – as well as the wealthy ones. Health, sanitation, gender rights, education, mobility, political participation, access to goods and services, and other indices are - despite patchiness, reversals and too-slow progress - improving overall.

Industrial society still depletes nature and resources

At the same time, the planetary natural resource base and its life-support systems, and the ecosystems, habitats, and populations of non-human organisms – are being relentlessly depleted and impacted. Despite decades of international commitments and action, the global society has not found a systematic way to balance our economic aspirations and the earth’s environmental realities. There can be no long-term progress or justice without resources, and no amount of progress can replace the value or functions of nature.

WWF’s mandate is to act at this intersection – between social progress and environmental damage – by preserving biodiversity in all forms, and by helping to reduce the impact of human development while ensuring quality of life for all. In order to act effectively, WWF bases all its work on up-to-date science and systematic analysis, shared every other year in the Living Planet Report (LPR). The LPR uses various indices for assessing the natural environment and human progress towards sustainability – two of these being the Living Planet Index (LPI) and the Ecological Footprint. The LPI is a status check of the major wild animal categories around the planet, while the Ecological Footprint provides a composite measure of our appropriation of so-called biocapacity, representing the planet’s capacity to provide ecological resources and services. In addition to these indices, the LPR and other research efforts increasingly employ the so-called planetary boundaries model of global environmental limits.

Living Planet Report summary

Here are the key statistics from the LPR:

» The global Living Planet Index (LPI) shows an overall decline of 52 per cent of the major wild animal categories around the planet between 1970 and 2010. We need 1.6 Earths to meet the demands we currently make on nature. This means we are eating into our natural capital, making it more difficult to sustain the needs of future generations.

» Fossil fuel use and resulting emissions are the dominant component of humanity’s Ecological Footprint (ranging from 43% in 1961 to 60% in 2012) and are together the largest single component for 145 of the world’s 233 countries and territories.

» The Ecological Footprint per capita of high-income countries remains about five times more than that of low-income countries.

» The planetary boundaries concept defines nine regulating processes that keep the Earth in a stable state where life can thrive. Transgressing any of the nine boundaries could generate abrupt or irreversible environmental changes. Four appear to have been crossed already: climate change, biosphere integrity, land-system change, and biogeochemical flows.

Progress towards sustainable development

Action since 1972

The warning signs detailed in the Living Planet Report and in other scientific sources are not being ignored. These signals are being translated, slowly but surely, into powerful policy mandates for global change.

Since 1972, when Swedish Prime Minister Olof Palme opened the first global policy conference on sustainability – the Stockholm Conference on the Human Environment – the world’s governments have individually created action frameworks based on ever greater evidence of the environmental situation. Similar action frameworks on human development have also progressed at the international level.
Sustainable Development Goals and the Paris Agreement on Climate

In 2015, after decades of largely parallel work, the separate global frameworks on environment and development were finally united into one set of global goals, the seventeen United Nations Sustainable Development Goals (SDGs).

Soon after, governments signed a new agreement for action to reduce carbon emissions, called the Paris Agreement. This positions carbon emissions reduction as the priority around which the rest of the SDG goals can be laid out. One way to view the implementation challenge of climate agreements, used by the UN Environment Program (UNEP), is in the idea of ‘bridging the gap’ between current practices and the lower emissions levels needed if the world is to limit warming to a relatively stable envelope of well below a 2˚ Celsius rise.

Implementation frameworks and the changing role of cities

These two grand frameworks, the SDGs and the Paris Agreement, bring a fresh mandate and new political and social resources toward achieving change, and renew the opportunity to take action. They also give rise to additional, action-oriented frameworks for implementing sustainable development: two of the most far-reaching are the sustainable consumption and production (SCP) agenda and the so-called ‘water-energy-food nexus’ concept of integrated infrastructure development.

SCP is a policy package as well as an ongoing discussion, summarised in UNEP’s Consumption Opportunities book. Both seek to demonstrate the economic and social advantages of more efficient and discriminating patterns of production and consumption.

The water-energy-food nexus is a policy approach, proposed in 2011 by bodies including WWF, the World Economic Forum, and the UN Food and Agriculture Organisation, which recommends treating the infrastructural, social, and economic framing of water, energy, and food as an interlocked ‘nexus’.

Cities have been a prominent theme in sustainable development policy since the beginning. Already at the 1972 Stockholm Conference, the very first of its 219 recommendations read: “The planning, improvement and management of rural and urban settlements demand an approach, at all levels, which embraces all aspects of the human environment, both natural and man-made.”

At the Earth Summit in 1992, Chapter 7 of the resulting mandate, Agenda 21, promoted “sustainable human settlement development.” This was carried forward in part by Local Agenda 21 action plans, at the municipal level, and supported by an organisation founded at around the same time: ICLEI - Local Governments for Sustainability. Since then, cities have increasingly come to be seen as important actors and potential leaders of action for sustainable development.

Sustainable development is a policy blending global environmental sustainability with economic progress in the South.

A key principle is common but differentiated responsibilities - shared goals, but differing paths.

A positive approach to this, including synergy and complementarity, aligns with a stronger role for cities.

North-South sustainable development relations

Sustainable development as a North-South pact

Sustainable development is not a principle derived solely from science; it emerges equally from political necessity. When awareness of environmental degradation reached a high point in the 1980s and 1990s, it became clear that any strict version of sustainability was destined to clash, and not just with economic development and industrial progress. It was also misaligned with the global human development agenda overall, which includes economic and industrial development to raise standards of living.

Simply put, while the total world resource footprint needed to shrink, the material consumption of the poorer, global South needed to grow. And leaders from the global South made it very clear that they could not be expected to restrain their economic patterns in the same way as the North was expecting. This logic was sound. The global North had for two centuries been responsible for by far the largest share of resource consumption and environmental damage. And still today, these same countries are permitting hugely resource-intensive and environmentally negative lifestyles and production modes. So how, argued the South, could it achieve the same material standards to which it is also entitled, without access to resources equivalent to what the North enjoyed for generations? And why should it be expected to peg its development ambitions at a material level less than that which the North lavishes on its citizens?

At the 1992 Rio Earth Summit, a first framework for global environmental protection was agreed upon, partly on the basis of an apparent solution to this political conundrum. The agreement at Rio stated that global sustainability could progress as long as it continued to support human development in the South. This is the precise basis of the phrase and concept of sustainable development. This linkage between sustainability and development was possible in part because of evolution of another powerful principle: Common But Differentiated Responsibility. Here is how it was expressed in Principle 7 of the Rio Declaration, the framing agreement of the 1992 Earth Summit:

“States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth’s ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.”

Common But Differentiated Responsibility

The SDGs and the Paris Agreement are significant achievements for diplomacy – yet they are also fragile because they explicitly rely on action through common but differentiated responsibilities at a scale that has never to date been achieved. The climate negotiations up to and including the Paris Agreement were far from easy,
and international governance seems to have reached the limit of its capacity to align otherwise contradictory interests within the current sustainable development discourse. If the Paris Agreement falls apart, through a lack of global collaboration, this will have dire consequences for human progress.

Common but differentiated responsibility is a young principle in international affairs, and is as unexplored as it is important. To date, it has mainly been viewed in defensive terms, and deployed as a tool of brinkmanship: the North must act, otherwise the South will not act. Increasingly, though, more nuanced interpretations are coming into play, seeking to interpret the principle as an opportunity.

Two emerging aspects of common but differentiated responsibility are particularly relevant in reinforcing the emerging potential of cities as actors. First, certain opportunities arise only when the relevant actors combine to act in common, for example, when a collaboration creates synergy, i.e. output that is more than the sum of the parts. Two cities working together to place a joint order for solar panels, would be an example of synergy – employing economies of scale to reduce unit costs compared to the cities’ purchasing solar panels separately.

Second, competence and resources being diverse and differentiated between North and South creates complementarity. This means, for example learning and exchange can be a mutually beneficial feature of urban development: cities of the global North can offer knowledge in areas such as urban planning, while large cities of the global South can offer experience in areas such as urban enterprise and citizen participation. In fact, because much of the North-South partnership rhetoric has stalled at the national level, emphasising the role of cities in North-South affairs becomes even more vital. It may be the last remaining way in which the North-South conundrum can be turned from a point of tension into a point of mutual opportunity.

North and South as provisional categories

Before looking further at the urban possibilities for positive change, a clarification.

While the concepts of global North and South help to interpret the complexity of relations between richer and historically poorer and post-colonial countries, they are not accurate categories for any one country or region. Increasingly, countries are exhibiting economic and social progress that entirely breaks out of the North/South binary. The so-called BRICS group - a shorthand for Brazil, Russia, India, China and South Africa - have population, consumption and production, and economic scales and speeds of change that demand a different approach.

It certainly isn’t the case, either, that the concept of North/South captures all of the justice and economic disparity issues that need to be dealt with when delivering urban sustainability. Urbanisation can and does exacerbate the disparity in wealth within a country, between urban and rural dwellers. And urban solutions often focus on parts of the city with already functioning infrastructure and services, rather than on those parts without, such as informal settlements. These are aspects of what has been called the green/brown agenda, or in the 70s, the environmental justice agenda. They are connected to the North/South concepts of justice, impact, and opportunity, but operate at different scales - many of them urban.

So, when used in this handbook, North and South refer provisionally to the different expectations of countries that are already economically developed versus those that are in the conventional sense, still ‘developing’. And while the urban opportunity fits broadly into this binary North/South narrative for now, it is already helping prompt alternative analysis.

THE URBAN OPPORTUNITY

Cities in sustainable development

The context in which we discuss the role of cities is clear:

» reduction in global resource consumption and biological impact is more urgent than ever
» there are new global mandates – the SDGs and the Paris Agreement – urging sustainable economic development, as well as conceptual frameworks that help to organise specific action – but not enough is being done
» North-South collaboration is more essential than ever, and a positive approach to common but differentiated responsibility can lead to synergy and complementarity.

With this context we can explore the role of cities in expanding action for sustainability. The first period of sustainable development policy evolution between 1972 and 1992 affirmed the role of cities as a framework and context for sustainable development. But in the period since then policy has started to interpret cities not just as primary contexts for sustainable development but also as lead actors, of change. How did this shift emerge? There seem to be three reasons.

Three reasons cities are becoming lead actors

National governments have been conventionally accepted as the leading actors in global affairs: they sign the treaties, and distribute the major budgets. But now, governments are willingly acting in new actor constellations, involving non-state partners, whether corporate, social, or technical. Prime examples of these include the World Economic Forum, the Clinton Global Initiative, and treaty conferences: the Paris Agreement was signed at a meeting with unprecedented input from non-state actors. In the contemporary landscape of decision-making, cities, especially large ones, have new institutional power.

Also, cities have simply grown in individual scale, and in the total balance of population and economic activity. To take a single signal example: in 1972, China had an urban population of 154 million people, which was around approximately 15% of the total population; by 2015, China’s urban population was nearing 800 million people, approximately 55% of the population. On a global scale, more than half the world currently lives in cities now. This vast scale of urban growth, and the ongoing tilt towards predominantly urban populations, means that national-level concerns, for increasing numbers of countries, are more and more linked with cities’ concerns.

Finally, environmental threats and their causes are not distributed equally. They are embedded and exhibited more intensely and more diversely in cities than in any other context. For example, the rise of the private car has enabled significant social freedoms, and is linked to economic development. But in the urban context, the contribution of cars is a mixed blessing, and in many cities its legacy casts a shadow over current prospects. Fossil-based road transport is directly responsible for critical pollution in cities of the North and South, and accounts for nearly 50% of all oil consumption worldwide. Indirectly, cities that are designed around road transport systematically spread wide and flat in a pattern called sprawl. Sprawl is itself a form of spatial inefficiency, and it in turn implies: urban development locked into expensive and
If we do not create jobs and prosperity for young people, we will never save the rhino or solve climate change.

Strive Masiyiwa
Founder, Chairman
Econet Wireless

Cities are the global hotspots of material consumption
Cities are also by evolution and design, in principle optimised for efficient resource consumption - through scale, spatial configuration, and infrastructure

Consumer lifestyles developed around private car use involve hugely intensive consumption of natural resources and an outsized impact on nature

As such, the so-called sustainable consumption debate has essentially merged with the sustainable urban lifestyles debate. The particular opportunity enabled by talking about consumption in an urban context is that we can address the systemic aspects – including supply-chain, retail, transport behaviours, workstyles, leisure patterns, waste – and their attendant scale effects. These concrete aspects of change need more focus, in addition to personal awareness, preference, and behaviour, as the latter measures have proved ineffective, on their own, to achieve necessary change.

The same thinking is relevant in the global South, even though far less consumption is taking place there right now. The particular opportunity for the South is to plan its cities for the highest quality of life but without locking in the resource and social inefficiencies and externalities of modern Northern urban lifestyles. This is not the same as suggesting the global South should not have access to the same opportunities. Instead, it is about making sure the cities of the South take this unique chance to leapfrog to the best available urban designs, economic systems, and lifestyles. Historically this is significant, because millions of urban dwellers in the South are currently in the early industrial phase of city living. They moved to the city essentially because of migration-inducing economic pressure, not natural choice, and find themselves with living standards often worse than those they had in the rural context: a leapfrog to something better can’t come too soon.

Much resource consumption and ecological impact which cities are indirectly responsible for does not take place in or near the cities themselves. This is because the centralisation of human habitation and intensity of economic activity in cities creates supply chains and other economic ripple effects that play out across the world. A city could be said to include not just what happens inside its territorial border, but ultimately all the actions and resource flows that are predominantly associated with the choices and activities of its inhabitants. The Ecological Footprint that WWF uses in the Living Planet Report is based originally, in fact, on an investigation of how much land and nature is required outside of cities to satisfy the consumption requirements of urban dwellers.

The city format represents a huge opportunity in implementing solutions for sustainability. First, modern lifestyles are more efficiently satisfied and managed in terms of nature preservation and resource use in the urban context: less logistics, easier waste management, more efficient distribution of the baseline services including water, energy and food. Second, in the city context, new solutions can rely on engaging concentrations of citizens and private, public, and non-profit organisations at far greater scale and speed than outside cities.

The reason cities are able to address resource flows at such scale, and to coordinate people in such quantities, is due to three features unique to cities: sheer scale; spatial properties including density and mutual industrial interactions (e.g. weavers and

Cities are drivers of resource consumption

The challenge of achieving responsible production and consumption is applicable to all, but applies predominantly to urban lifestyles. The reason for this is that these lifestyles, established mainly in the North in the 20th century, involve hugely intensive consumption of natural resources and an outsized impact on nature. This consumption is based on the way urban consumers eat, travel, live at home, work at the office, and enjoy their leisure time – and the infrastructures required to satisfy these demands. Cities in the South do have different patterns of resource use – but even there, behavioural patterns are trending towards Northern lifestyles. Using the example of energy requirements, urban areas account for around 70% of global energy use and over 70% of global energy-related CO2 emissions.

Cities as locations of change

Cities are drivers of resource consumption

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Efficient transport infrastructures to drive the economy; loss of essential food land; elimination of ecologically and socially important green space; and severe social costs.

Urban environments are not just intensive sources of environmental damage – they are also the primary recipients of it, in particular through climate change. Rural areas will be affected by climate change too, and usually have fewer economic opportunities than cities, but cities have special features that mark them out. For example, some of the largest cities in the world – including many of the poorer cities – are coastal and will be the first to experience the full force of climate change. This does not just entail extreme weather events, it also means incremental flooding that over time robs cities of their already dwindling cultivation land and natural habitats. City leaders and citizens are all too aware of the threats facing them, and not willing to wait for national governments to act.

These three reasons – the new actor constellations, the relative and absolute growth of urban populations, and the asymmetric distribution of causes and threats – demonstrate why global attention is gathering around cities as potential drivers of sustainable development. More than mere necessity, however, cities have special characteristics that enable their leadership of global change. These special features are the basis of the examples that this handbook promotes.

Commuter lifestyles developed around private car use involve hugely intensive consumption of natural resources and an outsized impact on nature.

Cities are the global hotspots of material consumption.
Cities are also, by evolution and design, in principle optimised for efficient resource consumption - through scale, spatial configuration, and infrastructure.
Cities are thus far more than mere collections of people. If a new food, transport, or energy system is implemented in a city, in principle all components change together – at a scale that makes a great difference. This is different from individual citizen-based action, for example – and is the insight leading to the idea of ‘nexus’ in the water-energy-food nexus approach.

These features are no accident: the spatial, scalar, and infrastructural character of cities, and their unique potential to enable efficient solutions, is the reason cities exist in the first place. Cities came about as ways to facilitate trade, exchange, and efficient productivity as much as for any social or cultural purpose, and this is the technical base of their growing relevance as change-leaders.

Better city design that exploits scale, space, and infrastructure can also lead to efficient environmental solutions as well as social and economic improvements. And while the frameworks of the SDGs and the Paris Agreement may be considered top-down effects, city-led development is more bottom up, because developments require some level of participation by city dwellers to be most effective.

The rural context and opportunity

An intensified focus on cities and their potential to shape change shouldn’t deflect attention from relevant action in rural areas. One of the simpler conceptual roles of rural areas is as part of the supply-chain of inputs to the urban economy: inputs such as food, water, fibre, textiles, and minerals. But rural settlements and economies are important in their own right for many critical areas of sustainability including nature protection and environmental pollution.

Rural dwellers are the frontline in preserving many sensitive habitats and critical natural capital (including ecosystem resilience) in the form of forests, wetlands, and keystone species. And large-scale rural farming practices lead to forms of cumulative damage that can bypass cities entirely, such as eutrophication. Thus as cities grow the importance of rural areas for managing natural capital and for managing and absorbing ambient pollution flows from agriculture also grows.

Cities cannot simply stand alone – though they harbour significant quantities of people they cannot also act as major anchors of ecosystem functioning and supply cheap food to billions at the same time. Rural economies and social dynamics should increasingly be structured to reflect this systemic role in which rural-urban relations obviously rely on rich interdependencies, beyond merely supply and support relationships.

Focusing on cities as leaders of sustainable change – as we do here – does not imply focusing only on the activity within the territorial borders of a city. The focus must include flows of resources that pass in and out of the city in relation to the different and specific human activities taking place in cities, and the cultural and economic relations that facilitate those flows.

Cities as lead actors of change

The second way in which cities are the critical next generation of solution providers is at the social and organisational layer. In other words, the human and social capital aspects of urban potential that sit on top of the more technical aspects, i.e. the scale, spatial, and infrastructural factors described above.

Cities, and urban regions more broadly, have leadership and organisational characteristics that often don’t exist at the national level. Specifically, the mayor or equivalent – in collaboration with an executive office team and regional leaders – can represent a concentrated political force with social popularity, a focus on local issues, and close control over budgets and administration. This is a seat of authority that can and has brought about massive change.

In the global South, the figurehead role of the urban mayor along with the narrative of the self-improving city together loom large in mass social development. These are examples of leaders, and communities, that could not and would not wait for change from the outside.

Case studies of this urban autonomy potential have flourished in Latin America, in cities including Curitiba in Brazil and Medellín and Bogotá in Colombia, whose pioneering mayors have been, respectively, Jaime Lerner, Sergio Fajardo, and Enrique Peñalosa. These mayors exploited the classic urban dynamics described above – scale, spatial design, infrastructure – to make a direct difference. But they also used their personal proximity to the issues and to people, as well as the character of the political system and social networks in their urban contexts to implement massive changes in a short period.

While it is true that in the political aspect of many urban dynamics the charismatic function of a figurehead is profound, mayors achieve really effective power to change their cities by gathering and empowering executive talent around them, by mobilising resources and skills in other sectors, and by recruiting and sustaining mass participation of citizens across the city.

Towards post-ideological urban platforms

In the North, one of the best examples of the breakout city, and standout mayor, is found in the tenure of Mike Bloomberg, the former mayor of New York City. He curated a vision for New York called plaNYC, and embedded it in the new Mayor’s Office of Sustainability, led by Dan Doctoroff. Bloomberg was uncompromising in his rhetoric around climate change and the role of the city in sustainability. This momentum, and the parallel leadership provided by Mayor Ken Livingstone in London, helped establish a global initiative called C40 Cities Climate Leadership Group – a collection of megacities committed to reducing climate impacts.

Notably, this group’s urban leaders rolled out policy platforms which are post-ideological: they have only loose connection to the policies of the conventional left-right spectrum, and were instead very place-specific and concrete. It is possible that it is the climate
What’s unexpected and particularly notable is that these groupings are self-consciously seeking to lead. They are offering themselves up as partners in governmental processes, exceeding national government targets at the urban level, and contributing to ambitious policy and research. Examples of this include ICLEI and partners lobbying the IPCC to add urban-centric research to their research and reporting structure; the Paris City Hall Declaration which was made by a meeting of mayors and local leaders in parallel with the Paris Climate Summit in 2015 and aims to go beyond the Paris Agreement; and the emergence of the New Climate Economy policy and research group and its recently launched urban sub-project, The Coalition for Urban Transitions.

There’s no use if a city is developed, but the people cannot enjoy the benefits. The people must be the masters, not just spectators.

Tri Rismaharini
Mayor of Surabaya

Cities have the power to mobilise, enterprises started, and public services delivered at the city level in ways that are just not manageable, realistically, at the level of most countries, even the richer ones.

Some examples of how cities could enable tremendous – rapid and scaled – impacts in social and environmental spheres are: recruiting the supporters of a city’s football team to an education initiative and using one of the footballers as a figurehead; starting a food-distribution or waste-collection service using otherwise unemployed casual labour; distributing vital healthcare via the public transit system. The effectiveness of people and organisations, which are central to such examples, is crucially enabled by the spatial and scale features of the city. We here see the special potential of cities in action, exploiting the technical features of urban living, while actively relying on the unique social and governance systems that people trust and own together.

Exploiting the city in these ways, and indeed giving the city its power in these forms, exploits a rich mix of different institutions, making the city what it is and can be. Beyond the formal actors, what the city is, how it is led, and how it leads forms, exploits a rich mix of different institutions, making the city what it is and can be. Beyond the formal actors, what the city is, how it is led, and how it leads.

The practical reality is that cities – in all their formulations – now need also to be accepted as some of the most powerful and fast-acting institutions available on the planet. On this basis, they can be added to the group of leading actors – governments, industry, research, enterprise, media, culture, and civil society – that hold effective levers of power and influence at the global level.
can be made interactive: cities such as Porto Alegre in Brazil have pioneered participatory budgeting, and it is being explored in a simple form in Paris, and could also be aligned with local financial innovations such as Gothenburg, Sweden’s use of green bonds.

Partnering and synergy

Beyond complementarity and mutual learning comes partnering, which seeks to achieve synergy — value that cannot be synthesised on its own. It is somewhat harder for cities than countries to be involved in multilateral partnerships, as cities have fewer resources than nations: global intergovernmental organisations are more developed than interurban ones, and there are so many more cities than countries. At the same time, cities can efficiently establish bilateral, place-to-place partnerships with selected urban counterparts to introduce spatial, infrastructural, social, economic, and governance collaborations.

The various types of partnerships that cities can arrange among themselves, in particular between North and South, deserve a study and inventory of their own, given both the novelty and the potential of this kind of approach. But some powerful examples of partnership synergy can be summarised.

One form of partnership can be called structured reciprocity: financial payment moving from North to South, in return for reciprocal value — access to markets, outsourced labour, commercial and cultural benefits — moving in the other direction. Conventionally, this would be arranged as a national, bilateral trading relationship. But a city or urban region such as the major industrial zones in China, might well negotiate this on their own terms. This form of partnership would support a key premise of the Paris Agreement, and other international agreements: that the North will send a lot of money to the South.

Another potential approach might be via distributed industrial development. The same technology, product, or industrial part could be tested in urban markets in different places around the world, and when sent for full-scale production, enjoy preestablished markets and sales channels. For example, rooftop solar panels or smart-grid technologies would benefit from diverse deployment scenarios during the testing phase, and an immediately scaled total market in the sales phase. Cities include, as described, actor constellations of various sorts, not just the municipal public sector. This insight is relevant here. Some technology solutions can actually facilitate North-South partnerships without any long lead times, for huge potential effect.

Lyft, the rideshare company that has established itself as the largest global competitor to Uber, received a billion dollars of new investment in 2015, partly on the basis of its new expansion to the cities of Southeast Asia, namely in China and India. The essence of this deal is collaboration between the cities served by the ridesharing companies in North and South through the Lyft app. Certainly, with or without a testing phase, a form of collaborative market is possible immediately, whereby a group of cities agree to make a joint purchase of goods or services that allow the price point to come down significantly.

The Lyft case is an example of both distributed development and collaborative market, and shows how city-level actors can operate at scales previously only imaginable for nation-level actors. Also, it demonstrates that collaboration between and among cities can bring about synergy: benefits that accrue due to active integration of efforts, rather than merely aligned but separate activities.

Shared leadership with others cities and national governments

What all this adds up to is new capacity, and new sources of capacity, for action on global sustainability, and confirmation of the role of cities as platforms for and leaders of this new generation of solutions. Where this action takes the form of sustained North-South partnerships, something additional — a form of shared leadership — might be occurring that has proved almost impossible so far on the international level. Demonstrating how cities can support the positive implementation of common but differentiated responsibility brings into view other ways that cities can foster intergovernmental action on sustainable development. For example, at the margin of the SDG debates are calls, in many countries, for reform of official development assistance (ODA), the grants and loans that countries of the North use to support countries of the South, including for sustainable development. Cities can be invited to have a stronger role in this, as it is likely governments will start to seek North-South city partnerships.

One form of this may be direct ODA distribution from Northern governments to larger cities of the South. This makes sense in principle not least because so much poverty — the major target of ODA — is concentrated in urban areas. In such context, governments might request that recipient cities have concrete plans for implementing the SDGs — all 17 goals being very relevant for the urban development agenda. Alternatively, ODA projects might focus on supporting and cultivating city-level partnerships between complementary cities in the South and North. The extent to which some cities are already leading partners in either voluntary or mandated carbon reduction programs makes this a natural step to consider.
The UN Sustainable Development Goals are 17 thematic targets agreed upon by the international community. These overlap significantly with WWF Urban Solutions platform, which divides sustainable urban development into 13 action themes. The diagram shows examples of linkages between the Urban Solutions platform and the SDGs. Some SDGs link directly to WWF’s Urban Solutions themes, and others link in a more general way. The learning cases in the following pages further demonstrate how Urban Solutions is a ready-made support platform for promoting and implementing SDGs at the city level.
BELO HORIZONTE, BRAZIL

Brazil’s sustainability lab
Belo Horizonte is at the center of Brazil’s third largest metropolitan area of 6.3 million inhabitants, and is the national winner of WWF’s city challenge for three years in a row (2014-2016). Belo Horizonte provides an impressive example of visionary and comprehensive sustainability planning and programs. This is what a city taking sustainability seriously looks like.

In 2011 the city adopted a climate policy with the goal of a 20% citywide reduction of greenhouse gas emissions by 2030. This is a broad sustainability program with 40 major projects and over 500 actions.

The city provides certificates to public and private companies that have taken actions to reduce emissions and energy and water consumption, especially in buildings. And it has switched all the city’s own public lighting to efficient sodium vapor lighting, as well as changed all traffic lights to safer, more efficient LED lights.

Belo Horizonte is also considered the solar energy capital of Brazil with its almost 3,000 installations of solar water heaters in residential buildings – more than 10 times the national average per capita.

In 2012 the then President Dilma Rousseff established the National Policy on Urban Mobility. This is a package of principles, guidelines and tools for all cities in Brazil, and mandates urban mobility plans for all cities with more than 20,000 residents, in return for federal funding. The policy, and Belo Horizonte’s self-appointed role in leading by example demonstrate the increasing prominence of cities in national action for sustainability.

Specifically, the city’s BRT (Bus Rapid Transit) system called MOVE – with two corridors, for a total of 38 kilometers – was opened in time for the football World Cup in 2014. It has the ability to transport 700,000 passengers daily, reducing travel times by up to 50%. This makes Belo Horizonte’s one of the largest BRT systems in the world, by passenger volume. The city is also building new bicycle lanes, has created a bikeshare system, and plans to increase the cycling network from 70 km to 360 km in the coming years – as well as partially pedestrianising the historic city centre.

Back in 1993, the new mayor of Belo Horizonte, Patrus Ananias, declared that food was a right of citizenship and it was the duty of the government to guarantee this right. Thus the city:

- subsidises some restaurant food, and food vans in poor neighbourhoods
- supplies food directly to public schools and other centres
- offers a nutrition program for families with malnourished children
- helped establish over a hundred community and school gardens
- regulates food distribution and prices in shops and markets to enable universal access to quality produce.

As a result, Belo Horizonte has almost eliminated hunger, reduced poverty, created price stability, and generated rural sustainability and a thriving urban and local agriculture sector. Belo Horizonte’s sustainability performance also includes participatory land use and emergency planning that has prevented loss of life and property from landslides and flooding. It has a strong claim to be one of the true world leaders in urban sustainability, and has much to teach cities in the North and South.

Malmö, Sweden

Starting in the 1990s, Malmö’s government decided to leave industrial decline behind, and embarked on a new vision for the city. This included a commitment to regional collaboration and economic development, starting with the Oresund Bridge to Copenhagen, as well as an ambition to be among the most sustainably-planned cities in Sweden, if not Europe. Two development areas stand out: the Western Harbour, which has pioneered low-car, high-density living, and Hyllie, which is pioneering 100% climate-neutral energy through its smart grid and an integrated energy, heating, cooling, and waste infrastructure. Malmö’s latest projects include Sege Park, which brings urban farming into the area, and Sustainable Rosengård, a program which worked closely with local inhabitants to plan an innovative property renovation and sustainable economic regeneration model. Malmö set its own target to use 100% renewable energy by 2030, and was Sweden’s first winner of WWF’s city challenge in 2011.

Malmö’s vision for Sege Park, with a public park amid urban farming and buildings

BEIJING, CHINA

Car sharing – the commercial use of individual vehicles for many riders – is a worldwide explosive transport phenomenon, led by Uber. And now, it is breaking through as a leap-frog transport practice in countries including China, where the leading player Didi Chuxing claims to have 300 million riders and 14 million drivers in 400 cities.

The promise of car sharing is that, by reducing the number of cars required to deliver mobility to a city, it takes cars off the streets and parking lots, and creates opportunities for better management, better urban design, and better vehicle fleet quality. Given the need to tackle air pollution and congestion – and on the other hand the convenience and lower cost than car ownership – it is no wonder China has joined the fast-paced global adoption of car sharing.
VANCOUVER, CANADA

Vancouver has finished the first part of its Greenest City 2020 plan, adopted in 2011, by implementing 80% of the 125 priority actions it set out to achieve by the end of 2014. It was the first global winner of WWF’s city challenge in 2013. Vancouver has reduced community GHG emissions by 7% from a 2007 baseline, though it is still far from the target of 33% by 2020.

The city has already met its 2020 goal of foot, bicycle, and public transit making up the majority of trips, and its goal to reduce the average distance driven per resident by 20%. The city has also come two-thirds of the way towards a 50% increase of city-wide and neighbourhood food production.

CAPE TOWN, SOUTH AFRICA

Sustainability for all

Cape Town became the global winner of WWF’s city challenge in 2014 for “its ambition and pioneering actions to combat climate change in its effort to bolster quality of life for its citizens.” This is based on years of sustained commitment to sustainability.

In 2006 the city became the first in Africa to adopt a climate mitigation plan. In the years following, climate change mitigation was integrated into the city’s plans and institutions, and in 2010 the Council of Cape Town approved a comprehensive Energy and Climate Action Plan with 11 objectives, 50 programs, and 120 projects. The plan focused on energy security, a lower carbon future, economic development, climate resilience and adaptation, resource efficiency, and poverty alleviation. A central plank of the plan is solar water heating. Cape Town managed to install 10% of all households and 10% of city-owned housing with solar water heaters (SWH), insulated ceilings, and efficient lighting by 2010 – that is, in 2,300 low-income family homes.

Recently, Cape Town intensified the solar water heating program with a mass roll out that planned to have 500,000 installations in place by the end of 2015, thereby reducing electricity demand by 3%. To achieve this, it has launched a residential solar water heater accreditation and finance program to encourage mid- to high-income residents to reduce their consumption of electricity. Cape Town has several programs to reduce its energy consumption:

- greening its 6,000-vehicle fleet
- setting up a green purchasing policy
- replacing its traffic lights and street lights and retrofitting municipal buildings.

To achieve energy efficiency in the wider community, the city has been operating an ambitious electricity savings campaign since 2009, including the creation of the Commercial Energy Efficiency Forum with over 200 participating companies. Transport is responsible for 30% of Cape Town’s citywide energy consumption, and the city has started the process towards a modal shift, with ambitious plans for an integrated public transport system and for an improved pedestrian and cycling infrastructure. It completed the first phase of Integrated Rapid Transit – an initiative to transform the public transport system – in 2010 with the opening of MyCiTi, a BRT system of dedicated busways using a fleet of modern, energy-efficient buses. Cape Town is expanding its bicycle and pedestrian provision in recent years, too.

Cape Town lies within the Cape Floristic Region, a UNESCO World Heritage Site, and is a global hotspot of biodiversity with the highest number of threatened plant species of any city in the world. To protect this unique nature, Cape Town’s Biodiversity Network has identified the minimum natural vegetation remnants needed to conserve the city’s biodiversity, and has taken action to protect 16 nature reserves.

The city council bases this sustainability work on a participatory approach, bringing together residents, NGOs, and local businesses. Another example is the Smart Living Campaign, aimed at promoting sustainable lifestyles amongst city staff, the private sector, local communities, and schools, as well as the Youth Environmental School (YES) Program, which arranges a year-round program of activities for learners and educators.

HAT YAI, THAILAND

Hat Yai is a coastal town in southern Thailand that is undergoing rapid urbanization and commercialization, with 260,000 people in the city and 800,000 in the greater area. Hat Yai has become a model for flood resilience in Thailand as one of ten core cities in the Asian Cities Climate Change Resilience Network (ACCCRN).

Shifting the focus from flood prevention to learning how to live with floods, Hat Yai has developed a resilience strategy with evacuation centers, an early warning system, education programs, and community-based capacity building. Hat Yai was chosen as Thailand’s national winner of WWF’s city challenge in 2015.

MOSHI, TANZANIA

By delivering clean, safe, and affordable water to more than 95% of its residents, and pioneering Water Safety Plans (WSP) across Tanzania, Moshi stands out in a country that for decades has struggled to improve its water management. Moshi is a medium-sized town with almost 200,000 citizens, located on the southern slopes of Kilimanjaro. In 1998, the Moshi Urban Water and Sewerage Authority (MUWSA) was created at a time when Tanzania was decentralising its water management system.

MUWSA has transformed an aged infrastructure created at a time when Tanzania was decentralising its water management system in the late 1990s. Since MUWSA was formed, it has transformed an aged infrastructure with a low number of household connections and frequent interruptions into a reliable public utility serving affordable, safe water 24 hours a day.

Waste is managed through recycling and composting programs, and water safety plans are being rolled out across the region. Moshi is a hub for environmental education programs, and pioneering Water Safety Plans (WSP) across Tanzania, Moshi stands out in a country that for decades has struggled to improve its water management.
Green bonds & carbon ambition

Gothenburg was Sweden’s national winner of WWF’s city challenge in 2015, based on its innovative use of financing instruments, and its deep-reaching climate targets. Gothenburg set a climate plan in 2014 that was innovative for its inclusion of consumption-based carbon footprint measurements and targets: emissions in other parts of the world caused by consumption from Gothenburg’s citizens, are included. Very few other cities in the world are taking this far-sighted approach. The overall goal is to reach a globally sustainable and equitable level of greenhouse gas emissions by 2050, which is interpreted as 1.9 tonnes of carbon dioxide equivalents per inhabitant per year. This isn’t easy for a western industrial city to achieve; according to Gothenburg’s estimates, its current consumption-based emissions stand at 8 tonnes per capita, so achieving this goal will entail more than a 75% reduction of total emissions. Gothenburg has set intermediate objectives:

» by 2020, to reduce direct emissions by 40% from a 1990 baseline, and to reduce energy use in homes by 30% and electricity use by 20% from a 1995 baseline

» by 2035, to reduce emissions within municipal boundaries to 2 tonnes of carbon dioxide equivalents per person and to reduce consumption-based emissions to 3.5 tonnes of carbon dioxide equivalents per person.

To achieve this, Gothenburg has embarked on a range of measures across the whole field of urban sustainability, including the West Swedish Agreement, a massive investment in the region’s transport system that helps to enable the following: a modal shift to public transport and cycling; investments in wind power and biogas production; and outreach efforts to reduce the climate impact of air travel, food, and citizens’ consumption of consumer goods.

The City of Gothenburg was helped in its calculations on consumption-based emissions by Mistra Urban Futures, a locally-based global research institute, which in 2014 published the report Low-carbon Gothenburg 2.0: Technological potentials and lifestyle changes.

In 2013, Gothenburg became the first city in the world to issue green bonds, a financial tool to combat climate change designed in 2008 by the World Bank. As of March 2016, the City of Gothenburg had issued $415 million worth of green bonds, financing a special portion of the city’s infrastructure investments and other projects, and creating new partnerships internally between the financial and environmental departments of the city. Several other municipalities and local governments have followed Gothenburg’s example, including California and the City of Johannesburg.

The global response to Gothenburg’s work with green bonds and consumption-based emissions has been tremendously positive. In 2014 alone, more than 40 delegations from 22 countries visited Gothenburg to look at the city’s initiatives. And Gothenburg has been invited to take part in the World Bank’s development of a new training program, the City Climate Planner Professional Certification Program.

Lappeenranta, Finland

In Lappeenranta, the national winner of WWF’s city challenge in 2016, a government dedicated to urban sustainable development, a university specializing in green energy, a budding clean-tech cluster, and an enthusiastic public have come together to create a city united by technical engagement in sustainability. Highlights include: construction of Finland’s largest and most modern bioenergy plant Kauvo; an internationally awarded Green Campus at Lappeenranta University of Technology (LUT); and development of a solar-powered Green Marina in the harbor. LUT has also created more than 20 spin-off companies.

Lappeenranta’s strategic goal for 2028 is to become a model city for eco-action, in which a clean living environment and a zero-waste world are sources of innovative business growth.

Tshwane, South Africa

The City of Tshwane was established in 2000 through the merger of 13 municipalities, including the executive South African capital Pretoria. It already has three million inhabitants and the highest urbanization rate in South Africa - a 65% growth rate between 1996-2011. Under the leadership of the Mayor Kgosientso Ramokgopa, Tshwane has embarked on a progressive course, tackling development issues and integrating sustainability principles. In particular, Tshwane is transforming its waste management away from dumping everything in landfills, to a modern system with recycling facilities, composting plants, and landfill-to-gas plants. Tshwane became South Africa’s national winner of WWF’s City Challenge in 2016.
Chengdu, China

Expansion & environmental protection

Chengdu is one of the world’s fastest growing cities. After the industrialisation of the 1980s, the city became known as the most polluted in China. Chengdu is cradled by a system of major tributaries of the Yangtze that could be fished as late as the 1960s, but whose mismanagement led to contaminated water, droughts, floods, and the spread of slums.

The cleanup of the Fu and Nan rivers received international attention – and UN Habitat awards. Chengdu succeeded through the strength of its own initiative, even though it was one of the poorest cities in China at the time. Involving inhabitants and local companies was key. Financing was generated by increases in land prices in areas that formerly had been slums. Slum dwellers moved to subsidised, newly-built housing. The UN highlighted the social dimension of Chengdu’s work, as it demonstrated that a poor town could clean up its environment, manage freshwater, and create a vision for a sustainable future, using only its own resources.

Chengdu’s pioneering work included:

- 200,000 jobs created
- 16 km of river dredged
- 759,000 cubic metres of sludge cleaned
- 42 km of trenches excavated
- 18 bridges and 12 new shipyards built
- 1000 polluting companies closed, renovated or relocated
- 100 public latrines renovated
- 26 km of sewage pipes laid along the river
- Two new sewage treatment plants built
- Rivers widened to prevent flooding
- Plantations and parks established on river banks
- Traffic around the rivers redirected, reducing congestion
- A “living water-garden” revived the traditional Dragon Boat Festival.

River remediation work was expanded upstream to the Minjiang River during the 2000s. The Minjiang flows through the district of Wenjiang, the centre of the ancient kingdom of Shu, and the river cleanup was praised by the UN. Rivers even further upstream, vital for fresh water, are also to be protected. Work on the rivers inspired Chengdu to construct a Giant Panda Sanctuary and the Dujiangyan Ecological Model Zone. In these efforts, Chengdu’s politicians have been helped by the Chengdu Urban Rivers Association (C U R A), a local NGO working to protect the water of the region.

The city is building smart electricity and communication systems. It has delivered one of the China’s first large-scale Bus Rapid Transit (BRT) systems, and is still expanding the metro and trams. It is enhancing the city’s forests, and has hundreds of plantations and parks established on river banks. Traffic around the rivers redirected, reducing congestion. A “living water-garden” revived the traditional Dragon Boat Festival.

Evidence of the extent of Chengdu’s leadership, and what it has to offer other cities around the world, comes in the form of partnerships including a special collaboration with Bonn involving an exchange of skill information, and collaborative development of opportunities.

Petaling Jaya, Malaysia

Petaling Jaya is a city with almost 700,000 inhabitants, part of the Greater Kuala Lumpur metropolis and originally developed as a satellite township of the capital. It has been working with sustainability issues since 2000, and became a pilot for Malaysia’s Low Carbon City Framework in 2010. The city is one of only a few in the world to reward residents for eco-friendly behavior through tax rebates of up to 100% for taking household measures on energy, water, biodiversity, transportation, waste, and for implementing other green initiatives such as a compulsory green building code. These measures are part of Petalang Jaya’s Livable Strategic Plan 2030, and the city was chosen as Malaysia’s national winner of WWF’s city challenge in 2016.

Mexico City, Mexico

Mexico City has built one of the world’s largest BRT systems – Metrobus – and one of the world’s leading bike sharing systems – Ecobici – in a major overhaul of the city’s transport system. The transport sector contributed 62% of the total carbon dioxide cut during Mexico City’s Successful Climate Action Program 2006-2012. That program reduced emissions by 13% in just four years, beating the 12% target. As of 2014, the Metrobus corridor system consists of five lines totaling 105 kilometers. A sixth line of 20 kilometers is under construction. As reported by the city, Metrobuses transports 900,000 passengers a day, which puts it in third place for throughput together with Guangzhou (850,000), behind Curitiba (2.3 million) and Bogotá (1.65 million).

At the present time, delivery-based home services are a huge part of the digital lifestyle transformation taking place in cities around the world. The potential that service-based and delivery-based living offers for urban sustainability is huge, based on the reduction in delivery vehicles, wasted storage space, disused goods and disposable packaging. But service-based living doesn’t need to rely on digital solutions: it can be based on social practices and organisational efficiency.

The Dabbawalla system in Mumbai is so efficient - delivering 130,000 individual lunch boxes to workers across the city, collected in the morning from homes and delivered back before the end of the day, relying almost entirely on walking, cycling and rail - that global logistics companies, world-class business schools and teams of consultants have visited to study it, and learn from its 5000 largely illiterate delivery workers.

Mumbai, India

Chengdu skyline
Sustainable energy everywhere

The city of Seoul was chosen as the global winner of WWF’s city challenge in 2015, for its comprehensive approach to tackling climate change and its determination to ramp up use of renewable energy. The city’s approach to radically reducing emissions involves not just promoting but also financing the increasing production of solar power, while reducing transport emissions through greener fuels, building more bus lanes, and car sharing programs. The first phase of its One Less Nuclear Power Plant program set and achieved the goal of reducing the city’s energy consumption from external sources by two million TOE (tonnes of oil equivalent), roughly comparable to the energy production of a nuclear plant with 2-3 reactors.

It did this in less than three years through heavy investments in energy efficiency and local renewables. Actions included investments in hydrogen cells, capturing waste heat, geothermal energy, energy caps for new buildings, building retrofit programs, LED replacements, eco-friendly transportation, and solar PV – including the Sunlight City project, which involved installing rooftop solar PVs on about 10,000 buildings, for a total capacity of 320 MW.

The program also pioneered energy savings through active participation by citizens in conservation efforts. This accounted for 40%, the largest single part, of total reductions, mainly through the Eco-Mileage program, which rewards energy savings by citizen with points that can be used to purchase eco-friendly products as well as receive financial support for retrofitting buildings. The program started in 2009 and has more than tripled in size since then to 1.68 million participants – 47% of the city’s households.

The second phase of the program plans for the city to achieve a 20% self-sufficiency in electricity by 2020, which equals another four million TOE of reductions: 46% of this come from the production of new and renewable energy and cogeneration, with the remaining 34% from improvements in energy efficiency and conservation of energy. The city has enhanced the Eco-Mileage program, linking it to its other energy-related projects such as production of new and renewable energy, building retrofits, and LED replacements. Seoul’s further investments in solar power up to 2020 include:

- 40,000 micro PV power plants that can be installed in homes for the purpose of enabling home energy production and greater awareness
- 10 MW “Solar Power Landmarks” along the city’s main streets
- The “Solar Power Generation Citizens’ Fund” for citizens to make direct investments in the PV power plant business and earn profits
- Expansion of rooftop installations on both public and private buildings.

And with continued investments in network fuel cells and its smart grid, Seoul is also building an infrastructure that can take advantage of small scale, intermittent electricity production.

Seoul is important because it acts as a model and partner for established cities of the richer North as well as fast-growing cities in the global South, in Southeast Asia in particular. More evidence of this surfaced recently when the previous Mayor of London Boris Johnson signed an agreement with the Mayor of Seoul to collaborate around the deployment of emissions-reducing technology.
In cities where there are many good public transport options across varying transport modes, one of the surprising barriers to greater adoption is the tickets themselves. Having to buy and have more than one ticket per journey, and having to pay multiple times even if the total trip is short in both distance and time, creates a strong disincentive to use public transport, even where the convenience compared to say driving is very high.

Solving this encourages multimodality, and it is the art of harmonising and popularising transit options in a city. Many global cities have extended multimodality to their core transport options of metro and bus, including Tokyo, Hong Kong, London and Paris. Helsinki has plans to bring all forms of mobility into the transit offering. The Finnish capital city will treat all mobility modes, including car share and bikeshare, as configurable transport options that can be used in one journey with one ticket, to make urban public transport as convenient and integrated as possible.

With 1.5 million inhabitants, the industrial city of Puebla is Mexico’s fourth largest urban area. In 2013, at the city’s request, Puebla became a pilot city for the World Bank Tool for the Rapid Assessment of City Energy (TRACE). TRACE is a practical tool for picking the low-hanging fruits of urban climate change mitigation. This work jumpstarted measures focused on street lighting, municipal buildings, transit systems, and solid waste management in Puebla and contributed to the development of a national urban energy efficiency strategy. In 2015 the city was chosen as Mexico’s national winner of WWF’s city challenge, in particular for its ambitious commitments and high level of investments in climate action.

The San Francisco Bay Area has pioneered conservation trusts – also land trusts and conservation easements – in urbanised areas. Around 28% of the entire San Francisco Bay Area is held in protection status. During the period 1988-92, nearly 60% (32,000 ha) of all newly available open space, for example from factory decommissioning, in the Bay Area was acquired by land trusts.

Now conservation trusts are expanding beyond protecting agricultural land and are protecting a wide range of ecosystem services available from land such as recreation in nature and habitat for biodiversity. One type of trust used for these purposes is a conservation easement, an agreement on the limits of land use, paid for directly or, for example, with reduced taxes.

Transport historically has been all about getting somewhere fast. How about the value of getting there slow? The High Line in New York City is a converted freight rail line, raised on a platform above the streets, and has been converted, thanks to lobbying by social activists and urbanists, into one of the city’s most beloved cultural attractions, a creatively landscaped and art-filled walking line.

It’s a 2.5km urban oasis, where pedestrians, whether locals or tourists, are invited to view the city around them at their leisure. One favourite part of the line involves theatre-style seating in front of a big window looking directly up 10th Avenue, as if the cars and street-life was a kind of theatrical performance. The landscaping favours local plant types, requires limited watering, and has been a magnet for wildlife.

Singapore has launched large investments in solar power over the last years under its new program SolarNova. It aims to install 350 MW of solar PV capacity by 2020, amounting to almost 20,000 rooftop installations and covering 5 percent of the city’s electricity demand. The Singapore Economic Development Board is working with key government agencies to aggregate demand for solar deployment across government buildings and spaces. Singapore has also invested heavily in energy efficiency and other energy measures, both in buildings and transports. This city-state pioneered congestion charges in the 1970s and is the only country in the world to cap vehicle growth and price vehicle usage aggressively.

Singapore, Puebla, Helsinki, New York
Paris was chosen as the 2016 global winner of WWF’s city challenge, based partly on the vision and actions of current and former mayors. On September 27, 2015 Paris barred traffic inside the périphérique ring road, effectively creating one of history’s largest car-free days, and transforming the city center to a walkable space all the way from the Champs-Élysées to the Bastille. Reducing city traffic by 30% was enough to cut pollution levels by up to 40% and noise levels by up to 50% in some areas. The initiative was part of the city’s commitments under its own 2012 Paris Climate and Energy Action Plan. Roughly half of Paris’ GHG emissions come from transport — and thus also roughly half of the planned cut of 25% total emissions by 2020 is intended to be achieved from the transport sector. To do this, Paris plans to cut inner city travel emissions by 60%, and other transport emissions in outer Paris by 35%. By 2009, the city had already reduced emissions by 12% since 2001, as well as doubling bicycle travel and increasing Metro travel by 16%.

Since then, Paris has continued with a number of actions, including improving public transport, launching the groundbreaking bicycle and electric car renting systems Vélib and Autolib, and building another 400 km of bicycle paths. Taken together, these actions are expected to reduce emissions by 40% in the inner city. To achieve the remaining 20%, Paris plans to: reduce the speed limit on the périphérique; create zones with a 30 km/h speed limit as well as pedestrian/vehicle zones with a 20 km/h speed limit; introduce stricter parking policies; and create a citywide low emission zone, banning access for the highest polluting vehicles. The city is also creating a new logistics system for goods transports, with the goal to have all last-mile deliveries made by non-diesel vehicles by 2020.

This promising trajectory is the work of Anne Hidalgo, the first female mayor of Paris, building on a foundation set by the previous Mayor Bertrand Delanoë. The Mayor’s visionary plan is being implemented by a central strategy committee which brings together external stakeholders and ordinary Parisians in participatory measures. For example, €500 million, or 5% of the city’s investment budget, has been allocated to projects chosen by the public through participatory budgeting.

Paris’ year of environmental achievement in 2015 culminated in COP21, at which the Paris Agreement was successfully signed. At the margins of the global political event, Mayor Hidalgo and former Mayor Michael Bloomberg hosted the Climate Summit for Local Leaders, a parallel summit for city and regional actors in influential roles. The outcome of this event was the Paris City Hall Declaration in which the urban leaders committed, among other things to:

- Advance and exceed the expected goals of the 2015 Paris Agreement to be reached at COP 21 to the full extent of our authorities [and] engage in partnerships among ourselves and with global organizations, national governments, the private sector, and civil society to enhance cooperation and capacity-building programs, scale-up climate change solutions, develop metrics and promote innovative finance mechanisms and investments in low-emission projects across the world.

This Declaration, coming together with the Paris Agreement, is a representation of the self-consciously collaborative and pathfind-ing character of today’s cities and their leaders.

COIMBATORE, INDIA

Coimbatore is one of 36 cities that has finalized its solar city master plan as part of its participation in India’s National Solar Cities Programme. The plan includes the goal to reduce conventional energy consumption by 30% within five years, through investments in renewables and energy-efficiency measures. As a first step, the city has started to install solar photovoltaic panels (PVs) on all municipal buildings, and is completing its energy-saving project for streetlights by using timers, dimmers, electronic meters, and LEDs. Coimbatore, also known as Kovai, is the second largest city in the southern state of Tamil Nadu, with a population of 2.2 million in the greater metropolitan area.

The solar city master plan includes comprehensive investments in an array of renewables and energy-efficiency measures both in municipal operations and in the wider community, and is coupled to BRT and bikeshare expansion plans.

ISTANBUL, TURKEY

The oldest form of human mobility – walking – is slowly making a comeback in cities. Cities are experimenting with car-free days, and boosting pedestrianisation around the world: Stockholm had a car-free day in 2015, Paris now has car-free days regularly, along with Bogotá and Jakarta. This is a sign of the North following the lead of the global South – Oslo plans to be entirely car-free in its downtown by 2019.

One of the most concerted pedestrianisation efforts has been quietly taking place in Istanbul, in collaboration with the visionary pioneer of the livable city, Copenhagen’s urban designer, Jan Gehl. In 2010, the Istanbul Metropolitan Municipality, supported by Jan Gehl Architects and the World Resources Institute, set out on a long-term path of pedestrianisation, in order to improve quality of life and air quality while preserving cultural heritage and supplying potential from tourists and locals alike in the ancient city centre. Since then, some of the main cultural monuments, including Sultanahmet Square, and hundreds of streets around the city, have been pedestrianised to wide social and commercial approval.
Evanston, the US national winner of WWF’s city challenge in 2015, is a suburban community of 75,000 people north of Chicago, mainly known as the home to Northwestern University.

In 2012 Evanston held a referendum where 79% of the voters authorized the City Council to set up an opt-out Community Choice Electricity Aggregation program. This means that the city aggregates residential and small business electric accounts to collectively seek bids for an energy supplier. Spurred by the work of the local NGO, Citizens’ Greener Evanston, the City Council also selected a supplier to provide a 100% renewable energy mix. In a few months, Evanston had halved emissions from electricity in the residential sector while the government’s own operations were now run on 100% green electricity, including from 25-kilowatt solar panels on the roof of the Evanston Water Treatment Facility. Evanston was catapulted to the top lists of the US Environmental Protection Agency’s (EPA) Green Power Partnerships.

By 2015 Evanston’s City Government was the 9th largest green power user among local governments in the US. On the EPA’s Green Power Community rankings, comparing the green electricity usage of whole communities, Evanston ranked 7th in absolute numbers despite its small size, and 6th in percentage of green power usage, which in Evanston’s case was 29%.

Evanston has continued to purchase 100% green electricity, and has also developed plans for an offshore wind farm in Lake Michigan. The aggregation program not only saved participating households money – by 2013 it also helped the city reach its goal of a 15% reduction of community-wide GHG emissions from a 2005 baseline, as set out in its 2008 Climate Action Program. In 2014, once again mobilised by Citizens’ Greener Evanston, Evanston took the next step in its new Evanston Livability Plan, which set the goal of a 20% reduction in GHG emissions by 2016 from a 2005 baseline.

Although the aggregation program was the biggest factor in reducing emissions, it is only one of many actions across the field of sustainability taken by Evanston, including: a low-income weatherization program, and other energy efficiency projects for buildings; a new green building ordinance; charging stations for electric cars; biking programs; a new transport plan, waste programs; a farmers’ market, and several outreach programs to residents and businesses. These are continuing to be developed under the Evanston Livability Plan, with a special focus on green power, building retrofits, transport, and obtaining emissions reductions by the city’s seven largest employers, who work collaboratively on sustainability initiatives through the Evanston Green Ribbon Committee.

Evanston’s ambitions and innovations in the area of transport are being noticed at the regional and national level – and are themselves a result of learnings from the global level. The car-free centre, and Evanston’s focus on so-called Transit-Oriented Development (TOD) are picking up attention in Washington and in Chicago. TOD in turn was inspired by earlier achievements in putting the citizen and urban quality at the centre of transport plans, in Curitiba, Brazil.

Muangklang is one of three model towns in Thailand’s Low Carbon City program. With very limited and mostly local resources, this small town of 17,000 people transformed its environment in the early 2000s, becoming famous for its green city development in the process.

Muangklang’s process started in 2001 with the election of Somchai Chariyacharoen, a mayor who wanted to bring the polluted Prasae River back to life, as this river is central to the identity of the Muangklang region. With a budget of only 81,300, Chariyacharoen launched a solid waste management system, which gradually grew into a comprehensive sustainability program. In cooperation with residents and different stakeholders, the system led to a significant increase in quality of life for the inhabitants.

Instead of constructing a complete building with a sophisticated incinerator, a simple outdoor conveyor belt was set up for waste separation, reuse, and recycling, which significantly reduced waste going to the municipal landfill. The operation paid for itself by selling compost, recyclable materials from the landfill, and locally-grown organic vegetables.

To improve air quality, the municipality started a program for free green public transport, investing in brightly-colored and traditional-looking natural gas-powered buses. Traffic has been regulated to reduce congestion, with reduction of car parking, promotion of cycling and walking with dedicated routes, and an introduction of a boat service on the dredged river, reviving this traditional means of transport.

Air quality and livability was improved further through a program of urban agriculture and greening. The city converted unused land and promoted urban farming, not only of vegetables, but also of rice, reviving an old local practice, with the aim of reducing food miles (the amount of logistics required for any food item) and energy from food transportation.

To improve the energy efficiency of its operations, the municipality introduced a standard for energy and environmental management, ISO 14001. Measures so far include: a change to high-efficiency air conditioners; migration of public lighting to efficient bulbs and solar powered street lights; construction of a high water tower to increase pressure and reduce pumping; more efficient garbage collection; and an energy-efficiency campaign in the community to encourage the use of green products. Muangklang has also started an education program in recycling and sustainable consumption in schools.

Mayor Chariyacharoen also put in motion ambitions for a cultural revitalization - linking this with the sustainability initiatives. In a traditional festival, or Tham Boon, on the renovated old boat pier, the municipality celebrated the clean-up of the river, and then launched an annual river festival. The popularity of these programs has ensured the refection of the mayor several times.

By 2020, Muangklang aims to be "a green, sustainable, and low-carbon city with low levels of waste, high energy efficiency and sustainable levels of consumption," as well as "a learning center for Low Carbon Cities for other local governments within Thailand as well as the Greater Mekong region."
A One Planet Future

WWF’s mission is to stop the degradation of our planet’s natural environment, and build a future in which humans live in harmony with nature. In order to achieve this mission, WWF focuses its efforts on two broad areas: Biodiversity and Ecological Footprint. WWF's long-term vision is embodied in the phrase One Planet Future.

WWF seeks a future in which humanity can prosper within the capacity of our one Earth to sustain people and nature, and where all people have equitable access to and use of natural resources.

WWF has ambitious global goals covering six thematic areas: oceans, wildlife, forests, freshwater, climate & energy and food – and three drivers: finance, markets and governance.

WWF works to ensure that:
- the world’s most important fisheries and ocean ecosystems are productive and resilient and improve livelihoods and biodiversity.
- the most iconic and endangered species are secured and recovering in the wild.
- the integrity of our most important forests, including their benefits to human well-being, is enhanced and maintained.
- freshwater ecosystems and flow regimes provide water for people and nature.
- a global shift toward a low carbon and climate resilient future is achieved.
- and sustainable food systems conserve nature and maintain food security.

WWF works through innovative partnerships that combine on-the-ground conservation, high-level policy and advocacy, as well as collaborations and communications to make business and industry more sustainable. Urbanisation and sustainable urban development are important emerging fields within WWF’s global program, and are key to the goal of reducing humanity’s impact, while meeting development needs.

One Planet City Challenge

The One Planet City Challenge is designed by WWF to mobilize action and support from cities in the global transition toward a climate resilient future run on 100 percent renewable energy. The Challenge is run every other year, and engages cities from 30 countries in the current round, and its outreach continues to expand.

Local governments and municipalities in participating countries are invited to present impressive plans and actions for sustainable transport solutions. Local context, including resource availability, legal mandates, and basic needs of residents, is taken into consideration in order to create a level playing field for evaluation.

Cities looking to join the Challenge can find the application form on the carbonn® Climate Registry (cCR), an internationally recognized climate reporting platform managed by ICLEI – Local Governments for Sustainability. Strategies will be evaluated by an international jury of experts in areas ranging from urban planning and transport to consumer behavior and energy systems.

Entrants will be evaluated on their ability to realize other key benefits like increased resilience and enabling attractive, one-planet lifestyles. In the City Challenge 2017-18, special mention will be given to cities that present holistic, inspiring, and credible plans for combating climate change and for dramatically increasing the use of sustainable, efficient and renewable energy solutions in the next few decades. Entrants are also evaluated on their ability to realize other key benefits like increased resilience and enabling attractive, one-planet lifestyles.

To this date, over 320 cities from more than 20 countries from around the world have participated in WWF’s City Challenge, showing the world their role in leading the transition toward a climate-friendly, one-planet future. Together, these cities account for 80% of all the climate actions reported on the cCR.

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Cities of the global North and South are sharing leadership for sustainability.

Cities are taking new, leading roles in the global transition to sustainability.

The UN Sustainable Development Goals and the Paris Agreement on Climate Change are the framework for action shared by the global community.

WWFs City Challenge aims to mobilize action and support from cities in the global transition toward a climate resilient future run on 100 percent renewable energy.

WWF’s Urban Solutions provide learning cases for the new role and partnership opportunity of cities, linked to the UN Sustainable Development Goals.

Why we are here
To stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature.

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