INTRODUCTION

Stop for a moment and picture the ‘City of the future’. Most people — regardless of age, gender or nationality — probably imagine some combination of tall shiny buildings, upward-thrusting architectural details, roads and paths on many levels and various bulbous transport devices that make a satisfying ‘whoosh’ sound. Few images are as universal across cultures as people’s ideas of futuristic cities and, ironically, few images are as rooted in the past as this vision of the future.

Where did these images come from, and why do they persist? Why are children today still drawn to the 1962–1963 Hanna-Barbera cartoon, ‘The Jetsons’, which remains in syndication on American cable television? While a dozen mid-20th-century architects played a significant role in shaping these images, the real source is a series of three industrial exhibits at the 1933, 1939 and 1964 World’s Fairs, held in Chicago and New York.

It is difficult to overstate the impact these World’s Fairs had on American culture, particularly during the Great Depression. The 1933 World’s Fair was attended by nearly 49 million people at a time when the entire US population was only 126 million. The biggest attractions at these three fairs were the transport and city-of-the-future exhibits; the biggest hit was ‘Futurama’, sponsored by General Motors. According to General Motor’s press release following the 1964–1965 fair, ‘Futurama’ attracted more than 29 million visitors, setting the attendance record for any industrial exhibit at any World’s Fair and eclipsing the 24 million visitors to GM’s earlier ‘Highways and Horizons’ exhibit at the 1939–1940 New York World’s Fair.

‘Futurama’ was enthralling. YouTube videos of 1939 and 1964 footage feature aerodynamically designed cars gliding through gleaming white interchanges. Pedestrians walk happily along skybridges, protected from the traffic below. Towers connect to elevated plazas filled with greenery. Cars, complete with tiny GM
logos, are everywhere, but of course there is no traffic congestion. Today's audiences may find these images quaint and familiar — in part because so much of the post-war world was shaped by them — but to visitors in 1939 to 1965, they were radical and compelling.

As 'Futurama' drove the design of urban renewal projects in cities around the world, designers began to notice problems not evident in the shiny 1:100 scale models. One was a problem of success. While the massive investment in superhighways and parking lots promised to eliminate congestion and create an easy-motoring Utopia, the speed, convenience and glamour of the car proved exceedingly popular. So many people bought cars and affordable new houses in auto-dependent locations that the new highways were rapidly beset with the same traffic congestion problems of the old cities’ streets.

Another problem was largely about building arrangements, resulting from designers’ fundamental misunderstanding of human habitat needs. Much criticism has been written about modernist architecture, but the buildings themselves were not the problem; rather, the issues arose from how they shaped the public space between them. Indeed, most cities have modernist buildings that are widely loved and remain vibrant to this day. Danish architect Jan Gehl wrote, 'Modernists rejected the city and city space, shifting their focus to individual buildings'. In her classic book, 'Death and life of great American cities', Jane Jacobs went further, linking the Modernists’ desire to strip away superfluous architectural ornamentation to a darker desire to tame the ‘disorder’ of cities: ‘There is a quality even meaner than outright ugliness or disorder, and this meaner quality is the dishonest mask of pretended order, achieved by ignoring or suppressing the real order that is struggling to exist and to be served.’

If anyone could have made this
modernist vision of cities work, it would have been the creative geniuses at Disneyland. They made a valiant attempt with Tomorrowland, both in its 1955 original and 1967 remodel. Tomorrowland was a celebration of transport technology, including a monorail, people-mover, submarine and various rides simulating spaceflight, each sponsored by a different corporation. The 1955 Autopia ride (see Figure 2), which remains popular today, highlighted the joys of the then yet-to-be-built interstate highway system.

Yet, despite Disney’s half-hearted 1998 effort to ‘modernise’ Tomorrowland with features such as edible landscaping, Tomorrowland has devolved into a kitschy ‘Yesterdayland’, a quaint, mid-century vision unconstrained by inconvenient consequences. Disney’s failure to help people visualise an engaging and sustainable future is indicative of the challenges that all professions face in moving cities toward sustainability. If the ‘imagineers’ at Disney cannot do it, how can anyone?

The sustainable cities of the future will look a lot less like George Jetson’s Orbit City and a lot more like today’s Portland, Oregon; Boulder, Colorado; Melbourne, Australia; and Barcelona, Spain. Pulling together themes developed elsewhere in ‘Sustainable transportation planning’,¹ this paper suggests the following nine defining principles for designing cities.

WALKING MUST BE PLEASANT FOR EVERYONE, EVERYWHERE

Sustainable city design starts with the human body and its needs. The human body depends on walking — 10,000 steps a day, by some estimates — to maintain optimal functioning. Thus, the first principle of a sustainable city is that walking must be delightful. It is not enough that walking be safe and comfortable. Cities must be designed so

Figure 2: Autopia remains as popular as when it was built in 1955

that people of all ages and abilities walk for the sheer joy of it.

Walking is fundamental not only to bodily health, but also to the health of one’s psyche. People are social primates, and their sense of where they fit in the group is governed by a set of complex interactions that work only at the scale and pace permitted by in-person meetings on foot. Remove frequent eye contact and touch, and one gets irritable and mistrustful.

Designing a pleasant walking environment is easy, and designers have no excuses for creating places that are uncomfortable to walk in, even in intemperate climates. Everyone knows the places where they like to walk, so a city’s design rules should be established to build on the successful examples.

Consider the following:

—Some of the best places in the world are composed of mediocre buildings that enclose beautiful spaces. Ensure the right proportions of buildings in relationship to the street.
—Focus on the bottom 30 feet of buildings, ensuring the right relationship to the pavement, richly textured materials and plenty of transparency. Inspire curiosity.
—Remember Jane Jacobs’s rule of putting ‘eyes on the street’ — four sets including occupied windows that look down on pedestrian ways and lots of people out and about. Humans find nothing more interesting than other humans.
—Moderate temperature extremes by providing shade and directing wind where it is hot and by putting sun and wind shelter where it is cold.
—Plant trees. Humans are creatures of the savannah and are drawn to places with trees.
—Maintain things to show that someone cares.

CYCLING MUST BE SAFE AND EASY FOR PEOPLE OF ALL AGES

Although city design starts with walking, cycling comes in a close second (see Figure 3). Bicycles dramatically expand the territory that can be covered under one’s own locomotion, providing more mobility with many of the same health and social benefits as walking. Cycling is also the most energy-efficient mode of transport ever invented, translating almost all of one’s metabolic energy into motion. For older adults and people with joint disorders, cycling, particularly with adult tricycles, can continue to provide mobility and health benefits, even as walking becomes more difficult.

To make cycling easy:

—Build a network of bikeways, separated from pedestrians and motorists, which connect most major destinations.
—Use traffic calming, education and other tools to ensure that motorists do not dominate cyclists on shared streets.
—Provide convenient, sheltered and secure bicycle parking everywhere.
—Find creative solutions for addressing the limitations of cycling, particularly barriers caused by steep gradients and poor weather.

THE NEEDS OF DAILY LIFE MUST BE WITHIN WALKING DISTANCE

The city of the future will continue to have cars, but no one will be dependent on the car for the needs of daily life. Instead, all basic services will be within walking distance, including groceries, schools, child care, dry cleaning and sundries. To be successful, retailers require a certain number of people within their catchment area. This means that there are minimum density requirements for a sustainable city, and that retailers need to be clustered in a walkable format.

Fortunately, designers already know
how to do that. Almost all
eighbourhoods built before 1945 follow
this pattern, including the streetcar suburbs
of Los Angeles, Midwestern small towns
with their Main Streets running
perpendicular to the railroad, many
beautiful older town centres such as
Savannah, Georgia; and most cities on
anyone’s list of ‘Best Places to Retire’. The
greatest urban places in the world —
Paris, Barcelona, Vancouver, Rome, St
Petersburg, Melbourne — offer not only
the basic needs of daily life within walking
distance, but all of life’s extravagances and
pleasures as well.

To eliminate automobile dependence in
a city:

—Create a retail main street for every
neighbourhood, and design each
neighbourhood to create a sufficient
market for retail success.
—Concentrate retailers in a walkable,
park–once arrangement.
—Plan for the right mix of retailers. In
boom–bust economies, consider limits
on some types of retail to maintain a
complete array of services.

**TRANSIT MUST BE FAST, FREQUENT,
RELIABLE AND DIGNIFIED**

The dominant transit technologies of the
twenty-first century will look a lot like
more refined and efficient versions of late
19th-century transit, and less like General
Motors’ vision from the mid-20th century.
In massive new town developments, such
as those already built in China and India,
designers will experiment with emerging
transit technologies, some of which will
prove marketable and others of which will
become curiosity pieces.

The fact is that most great cities of the
future will simply be retrofitted cities of
the past, requiring incremental upgrades to
existing transit services. For example,
although magnetic levitation (maglev)
offers potential for greater speed and
comfort than conventional steel-on-steel,
high-speed rail technology, maglev
requires that new systems be built all at
once, using new rights of way. Upgraded
conventional technology allows for
incremental expansion. New high-speed
trains can operate well, though at lower
speeds, along old track, making it possible,
for example, to provide direct rail service.
from Paris to London long before England completed its dedicated high-speed rail tracks to St Pancras station in the heart of London (see Figure 4).

To make transit attractive to people who have a choice of modes:

— Make transit convenient and relatively fast, frequent, and reliable.
— Ensure transit is comfortable and safe.
— Price transit so it is generally affordable and yet not considered solely as a social service for those who have no other mobility options.

NEIGHBOURHOODS MUST INSTIL PRIDE

Humans are tribal, territorial primates, apparently programmed to have a sense of belonging to a geographic zone of a certain size that ranges from the tiny, fiercely independent contrade of Siena — some just 500 feet square (see Figure 5) — to the ‘20-minute’ neighbourhoods of Portland, Oregon, where everything is within a 20-minute walk. Even mass-production homebuilders know the power of the neighbourhood, and while they may offer only two floorplans, different districts are assigned different names, and may offer different façade treatments, so that residents of ‘Tuscan Village’ can tell from their stucco walls and tile roofs that they are part of a different tribe from the vinyl clapboard siding and black faux shutters of adjacent ‘Colonial Estates’.

To cultivate a sense of neighbourhood:

— Use natural topography, drainages, and trees to advantage, to help residents define ‘defensible’ territories.
— Create edges, using rivers, parks, railroads, and major roads.
— Create centres, with retail, schools and community spaces.
— Provide places for neighbours to meet each other, including parks, post offices and front yards.
RESIDENTS MUST FEEL INVESTED IN THEIR HOME AND CITY

Throughout history, visions of the city of the future were driven by some One Great Man, who imposed order and a unifying style on the chaotic city. Even visions of the sustainable city, such as Paulo Soleri’s Arcosanti, Richard Register’s Ecocity and Sir Norman Foster’s Masdar in Abu Dhabi, all bear the stamp of a godlike master architect. Such schemes often gain the passionate support that acolytes shower on a charismatic leader, but so far none has got very far. Besides the challenges of financing megastructures, these unified Utopias are also limited by the human need to put down roots. To feel truly at home, people must feel superior to their houses, capable of altering them and permitted to do so to suit their purposes.

Owners instinctively defend their properties, and will fight to ensure that their properties increase in value. This powerful sense of ownership is available equally to renters and leaseholders, provided that renters are offered stability and a sense of control over their space.

To foster community pride:

—In all neighbourhoods, encourage an array of housing types so that households of all income levels can afford to purchase a home.
—Establish protections for renters so they can develop the same sense of community investment as owners.
—Encourage residents to extend their sense of ownership into public spaces, through street tree-planting programmes, community gardens and programmes.

Figure 5: The contrade of Siena are real Tuscan villages, and their dimensions match people’s territorial needs as social primates.

that encourage private citizens to invest in underused public spaces.

ENERGY MUST BE LOCAL AND SUSTAINABLE
Past visions of the city of the future relied on hyperabundant, cheap energy that would power hovercraft and personal jetpacks. Although some as-yet-unperfected new technology may one day resurrect those visions, it is more likely that energy will be scarcer and more costly in the city of the future, and that the externalised costs of energy production and distribution will be internalised. For transport, this means a lot more walking and cycling, along with more efficient versions of ground transport.

Regardless of their fuel source, cars will be smaller, lighter and more automated. Highly efficient, though almost forgotten, technologies such as the electric trolleybus of the mid-20th century will be reinvented, with overhead wires designed not just for engineering performance, but urban elegance as well. Once-abandoned 19th-century rail corridors will enjoy reinvestment as intercity high-speed rail lines, regional commuter and freight rail, or urban light rail. Cities committed to carbon neutrality may even see a return of the urban horse pulling ultralight carbon-fibre carriages, oxen pulling ever-sharp ceramic ploughs, and trans-Pacific freight once again shipped by wind power on speedy, oversized catamarans. When the true costs of carbon dependence are factored into future transport economics, these portmanteau 19th-century technologies may emerge as the most cost effective.

To be energy wise:

— Make cars lighter and smaller.
— Reintroduce rail lines.
— Build networks for walking and cycling so that people use their body’s energy source.

SOCIAL NETWORKS MUST BE ENCOURAGED TO THRIVE
The economy of the sustainable city of the future will not be based on agriculture or industry, but on networks: networks of information, networks of people, networks of capital. People who have ambition, creativity and a choice of places to live will be drawn to locations that are richly networked. These creative individuals will drive the new economy.

Creativity is not a solitary process. It happens within networks. It happens when talented people get together, when idea systems and mentalities merge. Anne-Marie Slaughter, director of policy planning at the US State Department, put it succinctly: ‘In a networked world, the issue is no longer relative power, but centrality in an increasingly dense global web.’

As geographic proximity becomes less important to productivity, social proximity rises in importance. Cities that support collaboration, even flirtation, will thrive.

To encourage the development of networks:

— Invest in technology, so that geographically isolated towns can tap into the global flow of ideas.
— Foster spaces where people can meet, talk and, most importantly, flirt. This means creating high-quality, convivial spaces and paying attention to critical details such as good lighting.
— Invest in art, but less as a collection of objects to be consumed, and more as a participatory experience.

BEAUTY MUST BE UBIQUITOUS
Most images of the city of the future have to do with style, such as Jules Verne’s
steampunk, the Jetsons’ Googie, Le Corbusier’s modernism and the over-the-top visions of the Russian constructivists. Modernism sought a universal, global style, the ‘International Style’, replicable in any location around the world. But if a sense of ownership is central to sustainability, style will probably remain fiercely local. Overly rigid local style enforcement can result in dull uniformity and kitsch, but the development of a particular local character can help make residents loyal to a particular place and eager to make social investments there.

Far more important than style, however, is beauty. The brain is hardwired to appreciate beauty, and the brain never tires of it, unlike most other stimuli. Not only do people appreciate beauty, but they work hard to maintain it. A fundamental principle in the study of sustainability is that it is almost always more sustainable to maintain and make better use of what one already has, rather than build something new, no matter how ‘green’ the new thing.

Why beauty matters:

—From an energy, materials and social sustainability perspective, reusing a historic building is almost always greener than building a new LEED Platinum building.
—If a thing is not beautiful, it is not sustainable. People fight to maintain and preserve the things that they love, and throw away things they do not.

CONCLUSION
The great cities of the future will not start with new technologies, styles of architecture, exotic polymers, fuel sources or software. They will start with the underlying needs of human biology, including bodies and minds. While humans may be one of the most adaptable species on the planet, health and happiness are dependent on a narrow range of habitat factors, all of which are increasingly predictable, based on research in the social, psychological and biological sciences. Because humans are creatures of the savannah, transport in the great cities of the future will always start with walking, making it delightful to get the 10,000 steps a day necessary for optimal functioning of their skeletal and circulatory systems. Because humans are tribal primates, the great cities of the future will facilitate a strong sense of neighbourhood belonging and ownership, while also connecting them to more global ‘tribes’ of likeminded people. Because social needs are complex, the great cities of the future will feature ample opportunities for connection and flirtation, while also meeting the need for privacy and intimacy. Because people are obstinate and ambitious, great cities will also not be designed by a few great architects, but rather by ordinary people, playing out their own vision and seeking their own happiness. Dreams about the future of one’s city should let go of the General-Motors-inspired Jetsons images and focus on the myriad small factors that shape one’s happiness and sense of home.

References