

An Urbanist Manifesto

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ABSTRACT

Humanity is now entering the Anthropocene Age, which the future will be able to judge either by global geologic evidence of humanity's failures or by the successful creation of a sustainable urbanity. It is clear that the present US political administration, and many rural areas around the world, can or will not work to accomplish this, so the present article focuses on what urban areas can do to bring about environmental sustainability. To accomplish this, we will need to deal not only with creating models of environmental sustainability, but we must also create economic, governance, quality of life and urban planning models supportive of both urban and environmental sustainability. This manifesto endeavors to identify the values and practices that must be stopped, the principals that must be honored, and the interconnected strategies through which our urban areas can fashion themselves into fully sustainable cities. The development of a new shared economy to replace the current primacy of global laissez-faire capitalism, the need to establish democratic urban governance worldwide, to put enhancement of quality of life ahead of GNP growth, and the establishment of urban planning and design guidelines will provide a path towards global sustainability of our common human heritage into a future of geologic time and space.

OUR GLOBAL PROBLEM STATEMENT

The world has entered the Anthropocene Age, a geologic epoch demonstrably different from all others, identifiable by its pronounced human activity^[1,2]. As with the Mesozoic (the Dinosaur Era) and the Quaternary (the Ice Ages), there will be traits left in sedimentary rocks currently forming that will distinguish the Anthropocene Age. Already, we are in the midst of the planet's sixth mass extinction, radioactive isotopes from atomic blasts and accidents at nuclear power plants have spread worldwide, toxic industrial waste has contaminated every continent and every ocean, and rising CO₂ and methane emissions have only just begun to expedite processes such as sea level rise and ocean acidification^[4,3-5]. Anyone-or all-of these have the potential to become the geologic signature for human presence, depending on their ultimate severity. Alternatively, the continued evolution of our shared civilization, begun several millennia ago, into a geologically sustainable civilization, identifiable by the vitality of its urbanity over geologic time could also be the signature of our presence. This is our collective choice.

If it is to be the latter, our Western civilization has a good many problems to solve first. Urban areas are more productive than rural areas, producing far more economic activity. In 2009 China developed 40% of its GNP from its 35 largest cities, containing only 16.6% of its population^[6]. In the US almost 85% of US GDP is created from its 259 largest cities, so both our problems and their solutions begin in our cities^[7]. In the Anthropocene Age, cities are just one more part of the natural world. Many problems we might consider rural in fact are rooted in urban issues; for example, strip coal mining is driven by urban power needs. Plus, urban and rural development is swallowing up our land; 10% of remaining wilderness areas have been lost in the last 20 years. The undeveloped territory now accounts for only 23% of the world's land mass^[8]. Urban stresses will only continue to increase: The rising global population, expected to increase by approximately 44% by 2100, is accompanied by a mass migration from rural areas to urban ones^[9,10]. As a result, urban populations could easily double in the next 50 years, primarily in the developing world, and with Africa as the epicenter, where infrastructure, jobs, and healthcare are severely lacking. This has resulted in a rapidly accelerated anthropogenic entropy a host of additional undesirable outcomes^[11]. Should a significant proportion of this population become consumers on a Western scale, one can only imagine the increasingly rapid degrading or depletion of our renewable and non-renewable resources^[12,13]. Plus, the majority of these urban areas are in coastal locations where sea levels could rise one to three meters in this century, and potentially to 10 meters if global warming is not halted^[14]. Meanwhile, many cities have an aging infrastructure, an increasing gap in income and wealth, a diminishing middle class, and persistent segregation^[15].

Compounding these issues, multi-national conglomerates are making their profits in the developed world's urban areas, yet are moving their manufacturing jobs, profits, and taxes off-shore, denying many cities the resources they need to mitigate

environmental stress ^[16]. Trickle-down or supply-side economics and neo-liberal or laissez-faire capitalism, which benefit large corporations and the wealthy in the short term, are no longer working for our cities or our citizens. In the longer term, these policies may also work to the detriment of these large corporations and the wealthy should the middle class become eroded to the point its remaining members can no longer economically support the top 1%. The creation or replacement of vital infrastructure, affordable housing, creative cultural facilities, liveable and walkable downtowns, a jobs-housing balance to minimize commuting, and so much else is not happening quickly enough. Where these structures are being built, their post-modern architectural design often produces a sense of placelessness and a resulting lack of civic or regional identity ^[17,18]. Plus, a significant portion of the population is turning to illicit drugs for relief from the stress of these societal problems, especially where they result in unemployment ^[19]. It is becoming apparent that too many national, state and provincial policymakers are locked into old stratagems to address urban dilemmas, too many of which can be labeled as post-colonial, racist, and sexist ^[20]. Finally, we are in the beginning stages of several major societal and economic disruptions which, if they are to have favorable outcomes, will need to be planned for. These include the transformation from 1) a global economy typified by neo-liberal (i.e. laissez-faire) capitalism and consumerism to one typified by post-materialism, or the shared ownership of consumer goods, the internet of things and inter-connected peer to peer business relationships, and 2) a middle class working at industrial and office administrative jobs which will be decimated by automation and replaced (hopefully) with work in creative and various high tech fields, which will require a different type of education than we are generally giving our children, and 3) a near mono-thematic cultural domination by the developed North (i.e. Western Civilization) that has diminished the value of the cultural and social norms of the undeveloped South and which will be transformed by the far more populous peoples and cultures of the developing nations as our world becomes more and more interconnected.

We must understand poor responses to environmental and cultural problems not the problems themselves were the causes that brought about previous instances of societal collapse. The work of leading theorists and historians such as Daron Acemoglu, James Robinson, Jared Diamond, Constanza Parra, Casey Walsh, and Joseph Tainter agree on this central point ^[21-24].

If urban problems are left unchecked, the catastrophic but natural result of our current trajectory will be the ruin of a number of cities ^[1]. Given the interconnectedness of societies across the world, this may even lead to the breakdown of regional or global order. I believe our only choice is to turn away from this path to build vital, sustainable communities ^[25]. Given the lack of action (and in some quarters even a lack of concern) by national, state, and provincial governments, as well as the greater opportunity to decisively test a variety of site-specific and culturally attuned solutions to our problems at the local level, we will need to focus efforts at these municipal and regional levels ^[26].

THEREFORE, LET US REJECT AND COMBAT

An Anthropocene Age characterized by global climate change, nuclear waste, toxicity, and mass extinction.

An urbanity that sprawls into and assimilates the suburban and rural, threatening the whole of the earth to become blanketed by our habitation.

The rapidly accelerating depletion of non-renewable resources due to globally unsustainable material consumption, barring our descendants from making use of them as we do ^[27].

A neo-liberal and laissez-faire capitalism that views Western cities as places to raise capital and make profits, while offshoring taxes and blue-collar employment ^[28].

A global ecology in which change is too fast for natural systems to adapt and evolve, potentially leading to ecological collapses ^[29].

The persistence of post-colonialist viewpoints by the developed North towards the developing South that historical progress is defined by Western Civilization and its values towards economic and social development.

The use of GDP as an important measure of progress.

Urban planning and design conventions that accommodate the ambitions of profit-driven development over the creation of vital and sustainable urbanity.

Federal government policies that support and encourage suburban sprawl ^[30].

An urban economy characterized by high-income inequality, a decline in the middle class, and, for the poor, a high degree of economic scarcity, high barriers to upward mobility, and insufficient public assistance to escape poverty ^[31].

The view, prevalent in much of Classical Economics, that Homo sapiens is instead Homo economicus ^[32]. In other words, the flawed proposition that human decisions are based on maximizing individual economic utility.

The related proposition that obtaining economic wealth and material possessions is more rewarding to personal wellbeing than other factors such as family, education, culture, community and leisure time ^[33].

Deadening public spaces that are more likely to take the form of aging, vacant shopping malls and appear identical to those of other cities than to inspire human activity, culture, and civic pride.

Cities that lack sufficient investment in the public commons-libraries, the public school system, public squares, and urban parks, athletic fields, swimming pools, transportation infrastructure, social security-to fulfill their citizens' needs.

Time- and resource-wasting commutes as a result of jobs-housing imbalances, fueled by a lack of adequate affordable and market-rate housing close to job centers.

The inequities that cause economic, social and health costs on all of society.

The view that the poor are poor primarily because of their conscious decisions, rather than due to past and current social exclusion factors such as racial and sectarian discrimination, sexism, minimized representation in government, and inadequate public education ^[34].

A war on drugs that has shown no perceptible decrease in drug use, but is directly associated with criminal activity, has wasted valuable public resources and is enmeshed with a prison system that seeks to punish instead of rehabilitating.

Welfare policies that create dependency instead of foster independence through education and training.

The view that today's economies are too large and concretely embedded to responsively change into sustainable models.

Political mindsets that deny the very existence of many of these problems, and instead seek to minimize change while maintaining the status quo that benefits the wealthy and powerful.

Knowing what to do, but failing to take action.

WHILE WE ARE GUIDED BY THESE PRINCIPLES

As the world urbanizes, cities can and will become increasingly powerful relative to national and state governments, and thereby become the centers of change for environmental, economic, and cultural sustainability.

Globally and regionally, at a minimum, we need to live within definable sustainable ecological boundaries ^[35,36].

Governments cannot privilege the rich and powerful over the people and still fulfill society's most important goals ^[29].

While our growing world population will likely by itself create global economic growth for some time, the need and will to stabilize world population together with the transition to balanced and durable urban economies around the globe can and will lead to a stable and sustainable global economy ^[37].

We can still have societal progress, increasing levels of personal satisfaction, and growing economic health despite GNP indicating stable or even declining economic numbers.

Publicly funded mega-projects that primarily benefit the wealthy-such as new athletic stadiums that offer financial incentives to corporations are not in the public interest ^[38,39].

The Enlightenment proposition that scientific and industrial progress inevitably leads to societal progress has been shown to be invalid ^[24,40]. Our guides to urban societal progress should instead be from viewpoints such as Critical Urban Theory, Integral Theory or those associated with the degrowth movement ^[41-45]. A common thread of these viewpoints is that societal progress, which has more to do with eliminating poverty and prejudice while increasing individual freedom, is inevitably associated with an educated populace ^[46].

Economic systems based on consumption of non-renewable resources and the exploitation of any class of people cannot long survive ^[47].

From the "bottom up" economics is far superior for the vast majority of our citizens than Trickle-down economics ^[48].

Our Urban Economics must be post-classical, post-materialist, attentive to verifiable human behavior, and be forward thinking in a manner that allows us to take specific actions.

Entrepreneurial businesses located in urban areas lead to innovation and create the vast majority of new, higher-paying jobs ^[49]. On the other hand, much older, larger, and multi-national conglomerate corporations have a negative impact on cities by downsizing and offshoring employment.

The ownership and control of public resources by profit-maximizing corporations will lead to their exploitation and waste over the long term.

The success of policies promoting urban vitality is best measured by markers of happiness, health, and harmony, rather than economic growth ^[50-53].

Reducing income and wealth inequality will require tax reform and substantial investment in social and economic development programs for the lower and middle classes ^[54].

Efforts to combat widespread drug addiction should be rooted in inhumane treatment and medical science, rather than persecution of the addicted ^[55].

For the vast majority of prisoners, the main purpose of their incarceration must be rehabilitation through education, to protect society both from costly recidivism and the creation of a class of citizens that have increased difficulties finding gainful employment ^[56].

Diversity, tolerance, equitable justice, eliminating poverty and environmental sustainability through mutual support are the foundations of civic life.

The long-term survival of a democratic government relies on a well-educated electorate, political debate, and a free and independent press; it is undermined by the dominance of wealthy donors and paid advertisements attacking political candidates ^[57,58].

Where national economies may be too large, or their states too politically immutable, to responsively undertake sustainable policies, the focus on our cities where new policies and interventions can be undertaken much more enthusiastically, and with much less resistance from global corporate interests ^[59].

Cities North and South need to work together to minimize exploitive ecological exchanges that transmit ecological impacts great distances from users while subsidizing low priced consumer goods while at the same time minimizing our global ecological footprint ^[60-64].

A post-materialist society that with a resource based, collaborative commons economy ^[65] that provides for all the basic needs of its citizens is possible with today's technology. Its services and guarantees should include affordable housing, public safety, basic health care, quality education, individual rights and freedoms, full employment with an ample supply of engaging jobs, an economic safety net within a "steady state" economy ^[66-68].

Economic colonialism, sexism, and racism are contrary to the very notion of what a truly sustainable urban society might be.

While Ecomodernism may be acceptable to some societies, some societies will reject it, and do not respect this would be a form of economic colonialism ^[69]. By the same token, a degrowth program to shrink our most developed economies in order to reduce our global carbon footprint is unlikely to be acceptable to many societies either. Instead, by channelizing economic growth through appropriate incentives we can work to develop a sustainable post-materialist economy.

All cities are now only in the early stages of sustainable development.

Research needs to continue into new forms of political ecologies and urban economies, both in academia and urban communities ^[70,71].

When citizens' economic needs are not met, especially those associated with increasing income inequality, a democratic system is more likely to regress into autocracy as the populace seeks economic security ^[72].

Sustainability planning requires at least a 100-year look into the future (NASA????) and implement to the extent possible the following policies.

The following policies are organized following ^[73] (with slight modifications), and adding the fifth domain: Urban Planning and Design, in order to clarify the role of Urban Planners and Architects in Urban Sustainability.

The Environment

An active urban environmentalism in the Anthropocene Age is especially important in those cities where national, state, and/or provincial governments are not responding adequately to urgent crises, as activism can be much more fruitful here, and the environmental challenges noted above are immense. To meet these challenges, we must put in place sustainable, cost-effective solutions that our cities can afford to put in place today.

We are fortunate in that the technological improvements converging around autonomous, electric, ride-sharing vehicles should mean that these vehicles will provide upwards of 95% of all kilometers driven between 2025 and 2050, assuming protectionist measures are not taken against them ^[74]. This has the potential to cause a significant enough drop in hydrocarbon fuel use to meaningfully reduce the size of our annual global carbon footprint.

Regarding our carbon footprint, our goal should not just be to reverse the growth atmospheric carbon dioxide but to enact policies that will reverse global warming by actually reducing atmospheric greenhouse gases. We can do this if we ^[75]:

- Halt construction of all new hydrocarbon power generating facilities
- Incentivize and provide target dates for the transition from hydrocarbon fuels to renewables, and environmentally destructive chemicals to sustainable substitutes
- Require all new buildings and significant renovations to be Net-Zero/LEED-certified while incentivizing additional retrofits
- Install methane digesters in all landfills and include compost collection with all recycling. Improve existing recycling programs for reuse of materials and efficient energy production
- Develop city-wide bicycle- and electric-powered mass transit transportation infrastructure

- Require airports and airlines to more efficiently manage fuel use
- Tax high-energy industrial uses, while incentivizing the means to reducing their power needs
- Build distributed solar power stations in the developing world, adding grids to create storage capacity
- Incentivize bio-engineering research into the economically affordable removal of greenhouse gases from the atmosphere
- Create, protect, and manage as many forests and urban green spaces as possible, to aid with carbon sequestering and environmental cooling

Concurrently with these initiatives, coastal cities need to plan today for a rise in sea levels, which NOAA predicts may range from 0.3 to 2.5 meters this century ^[76]. Municipalities should build sea walls and gates, convert low-lying areas to estuaries and parks, and direct growth to the higher ground ^[77]. This process should not be delayed, as recent research has indicated that sea-level rise occurs in spurts. While geologically recent deglaciations have generally resulted in sea level rise rates of one to two meters per century, during last major deglaciation, the resultant sea level rise of approximately 60 meters happened in three- to ten-meter steps over periods as short as several decades ^[78,79].

Cities must also protect their residents from known geologic hazards, or remove them from these areas, by implementing no-build volcanic zones, flood zones that anticipate future climate changes, and improved earthquake and tsunamis construction standards ^[80].

In dry climates, water supplies need to be enhanced and water-saving techniques expanded. Similar to the plan in effect in Santa Fe, NM, households should be allowed an appropriate amount of water per month; beyond that allotment, rates for both households and other uses should rise progressively to discourage wasteful usage ^[81].

Penalties for dumping toxic waste into the environment should be punitive, with corporate management held personally responsible when found guilty.

Urban regions should protect, minimize the use of, and/or recycle those non-renewable resources for which there may be no technological fix such as aquifers in arid areas phosphorous, etc., and promote both public ownership and the moral economic use of such regionally strategic, non-renewable resources ^[82,83]. Shareholder wealth-maximizing corporations intrinsically prefer short-term profitability over long-term sustainability, and thus are not appropriate stewards of such resources ^[84]. The import-export components of regional economies need to be supported to allow regional scarcities to be equitably offset through trading ^[85].

Like those ancient cities that have survived to today, newer cities must establish themselves in balance with their surrounding ecologies ^[86]. The nature of this balance will be unique to each city, but at a minimum, it will require analysis of regional ecosystems, evaluation of water supplies given foreseeable climate change plus regionally sustainable material sourcing.

Certainly, human behavior can determine which species live or die. In addition, we are the only conscious agents of change in the world. Any responsibility for creating a sustainable future for all life on this planet can only fall on ourselves ^[87]. To do so, we need to:

- Preserve as much wilderness as possible ^[88]
- Slow overall population growth by providing family-planning services, especially where growth is highest ^[89]
- Improve women's education and provide loans and education to assist women-owned business formation ^[90]
- Shift global population growth from rural or suburban areas to urban areas, responsively to specific urban typology ^[91]
- Incentivize a reduced demand for animal food sources in our diets, and then convert unused grazing land to food crop agriculture ^[92]
- Incentivize restoration and the efficient utilization of existing agricultural lands through improved irrigation techniques, silvopasture, regenerative agriculture, and improved land management technologies ^[93]
- Grow crops as close to city centers as possible, such as by maximizing urban rooftop gardening ^[94]
- Minimize the use of all pesticides, and immediately eliminate the use of those that do not fully and safely decompose within a reasonable time period ^[93]
- Minimize and eliminate regional crops and imported foods with DNA modified for pesticide resistance, substituting them with crops whose DNA is modified to enhance pest resistance ^[95]. This strategy may be less profitable for Monsanto, but it will be far healthier for the planet
- Better regulate the dumping of toxins, whether underground, in our waterways or in our oceans ^[96]
- Create webs of ecological recycling loops composed of cities and their surrounding rural areas and as networks of sister cities in order to facilitate the sustainable regeneration of all basic necessities ^[97,98]

Urban Economics

Each urban economy will give its own region's distinctive traits to the contours of the currently developing economic realignment^[99-101]. The realignment will replace the domination of our current neo-liberal laissez-faire global capitalism, hopefully with enough regulation to constrain its exploitive impulses, with one more oriented towards big data, sharing networks, high-level content, and direct peer to peer services. If trends in income inequality are to be reversed, if poverty is to be reduced and the middle class enlarged, and if gentrification is to give way to true revitalization, then a shift in urban policy priorities needs to occur with this realignment. Fundamentally, policymakers need to focus on appropriate policies and manageable projects that seek to educate and lift up the impoverished while improving infrastructure and the quality of life for all of their citizens instead of seeking growth policies unrelated to increasing overall living standards, increasing materialistic consumption that endanger environmental sustainability or on economic programs and mega-projects that squander valuable civic resources on the already wealthy^[102,103].

While Michael Jensen's Harvard Business School Model of corporate governance, which posits that the only interest of corporate managers should be toward shareholder wealth maximization, did not reach its primacy until 1976, it has already caused tremendous harm by minimizing the need for managers to account for all other stakeholders^[104].

However, managers are the employees of the company, not employees of the shareholders, and thus are employed to serve the entirety of the company's interests (i.e. all stakeholders), rather than the narrower interests of the shareholders. Furthermore, for entrepreneurs, taking a company public is just another form of financing corporate growth. Ultimately, shareholders should be treated similarly to other financial interests, though with two distinguishing rights, first, to buy and sell their shares in the marketplace, and second, the penultimate right to change Board membership when past oversight has floundered.

Instead of Jensen's formulation, the true purpose of a corporation should be to serve customers by sustainably and ethically produced goods and services at the highest quality for a given price point, thereby maximizing long-term, sustainable profits.

Company managers should thus be held directly responsible for managing all stakeholders' interests in a firm, including labor, suppliers, consumers, and the public^[104]. Urban governments should consider a corporation's statement of purpose before entering a business relationship, and regulate and enforce sustainable and ethical practices in their jurisdictions. An open, efficient, and information-rich marketplace can help ensure companies are properly rewarded for the quality of their products and services.

GDP is not just a poor measure of economic progress (i.e. it does not factor in items of obvious economic value such as the many free services now provided by the internet, or the rapidly increasing quality of high tech products, or the benefits of the emerging sharing economy, etc.), but truly fails at measuring societal progress. Broader measures such as Bhutan's Gross National Happiness Index, Buen Vivir, Ubuntu or a number of others should be used instead by urban policy managers^[50,51,105-111].

In the past, successful cities have generally been located on trade routes and/or controlled important resources^[112]. In the future, the most successful cities will be hubs of information, centers of learning and entrepreneurship, embracing the process of creative destruction that creates new jobs and wealth^[113]. An urban economy should not anticipate that multinational conglomerates will provide job and income growth, nor should they spend funds or reduce corporate tax rates to attract such companies—the risk is too high that such companies will later leave for jurisdictions with even lower rates^[114]. Urban areas will need to create the necessary urban resources that will attract and keep those employees most desired by the entrepreneurs and growth firms they would like to attract, in order to be most attractive to those same firms. Plus they will need to find other ways to appropriately incentivize, nurture, and promote these firms and entrepreneurs, for it is these firms that will most appropriately utilize their regional resources, create the majority of new jobs, and keep their workforces local^[115].

Urban societies will need to allow their members as much freedom of choice as possible in terms of diverse work opportunities plus a public, collaborative commons to support differing work-life balances in order to attract and maintain a diverse workforce. In addition, urban economies should minimize income inequality through taxation, zoning, and affordable housing policies, enabling residents better access to higher-paying jobs and quality education for their children^[116]. In an urban economic model, cities with distinct low-income or spatially segregated neighborhoods should:

- Encourage greater entrepreneurship within these neighborhoods, especially for construction, service, and emerging industries, via targeted education and mentoring programs, the use of family banks, enhanced savings options, and women's enterprise initiatives^[117]
- On the federal level, support providing sufficiently progressive inheritance and income tax rates to prevent the buildup of capital and wealth among the top few percent of citizens as well as appropriate incentives for the lower and middle classes to begin investing while still young, to own their own homes, and become entrepreneurs in greater numbers^[118]
- Minimize income, property, and sales taxes that disproportionately affect the bottom one-third of incomes
- Provide minimum wage and labor standards to protect workers without overly burdening consumers
- Promote welfare, disability, and unemployment programs that enhance the short-term safety net while reducing long-term economic dependency by creating jobs programs for expanding regional industries^[119]

- Ensure that educational institutions and health care centers in these areas are equal in quality to those in the city's wealthy neighborhoods.
- Develop medium-density, quality housing with long-term affordability throughout the city's neighborhoods. Long-term affordable housing is especially needed for artists, whose work often nurtures creative communities necessary for the cultural development of urban areas, but who struggle to pay the rising rents in revitalized communities
- Increase enforcement of laws preventing racial steering
- Offer homeownership financing opportunities that low-income residents can afford
- Resist the creation and maintenance of class and racial barriers, such as low-income housing that is almost invariably cited in low-income neighborhoods and spending on education that is almost invariably substantially higher in high-income neighborhoods ^[120]
- Promote family planning with contraceptives, education, or other means tailored to local beliefs and practices ^[121]

Our urban economies need to embrace the current economic realignment to a sharing economy characterized by big data, networks, peer to peer, etc. accept the very real limits to global growth, accepting the process of creative destruction as an engine for a vibrant economy, societal progress and income redistribution ^[65,122]. In doing so, they should:

- Create and promote a plan to achieve full sustainability, with annual achievement yardsticks on the path to implementation
- Allow entrenched economic interests of the old economy to decline and fail, rather than squander valuable public resources on what will likely be futile attempts to save them ^[123]
- Encourage and support new political ecologies ^[124,125]
- Encourage and support new, smaller, more creative entities and nimble entrepreneurial firms to flourish and create new jobs in the new economy ^[126]
- Develop worker retraining programs consistent with full employment policies ^[127]
- Develop enhanced collaborative commons using Behavioral instead of Classical Economics to encourage our evolving post-materialist sharing economy ^[128]
- Be open to new political ecologies and view on the value of growth vs. degrowth, and how to best work with these new ecologies ^[45,129,130]
- Recognize that at some point Global Economy as measured by GNP is likely to stabilize at some level and their economy is likely to as well ^[131,132]. However, cities will still be able to create societal progress, increase levels of personal satisfaction, and even progress in those types of economic growth not measured by GNP, i.e. better technology, products, and services offered at lower price points, more leisure time, etc
- Tax all products sufficiently to cover 100% of their recycling costs
- Decentralizing energy production via local, renewable sources providing low-cost electricity without the need for energy storage ^[133]
- Decentralizing, democratizing and deregulating crowd sourced capital to supply less expensive loans and capital for the economy ^[65]
- Support a negative income tax similar to that proposed by Milton Friedman, which would decrease government bureaucracy, remove disincentives to work, increase volunteerism, provide enhanced justice and equality as well as a sufficiency of funds moving through the economy in the event that AI and automation decrease the total number of jobs available in the economy ^[134]
- Enact regulations to protect citizens from the potential problems of our new economy, such as a loss of privacy from big data and increased income inequality from high tech wages ^[135]
- Expand the tax base to offset decreasing federal contributions (where occurring) by halting long-term tax incentives, utilizing progressive property tax rates, split-rates taxes, and increasing land taxes on under-utilized properties in dense areas. The latter will not substantially affect building values, but it will provide an incentive to develop new projects in urban vs. rural areas ^[136]
- Create a substantial affordable housing requirement on all new multifamily development, such as through an inclusionary housing ordinance. This may need to be phased in over a three- to a five-year period so as to not unfairly affect planned projects ^[137]

- Incentivize and help capitalize private investment funds that invest in growth firms ^[138]
- Keep the moral economy and society's welfare in mind when employing advances in artificial intelligence and robotics ^[139]
- Automation will likely have its greatest initial impacts in developing countries due to their greater reliance on low-skill industrial jobs, but may eventually result in major job losses in developed countries as AI technology improves. We may be able to partially offset this through tax policy and labor requirements in certain industries, such as infrastructure construction, nursing, food service, etc
- Given the preponderance of research showing that once a satisfactory income level has been attained, additional levels of income do not bring proportionate additional satisfaction. Rather, markers of happiness become much more important, i.e. health, family life, longevity, security, literacy, equality, political and community participation, etc ^[140-142]
- Enhance “bubble-up” economic policies instead of “trickle-down” ones, because promoting income growth among lower-income families will give them greater capacity to rise out of poverty ^[143]

Trading and tourism economies should be developed and supported so that the interest and provide long-term value to other regions. Regional distinctions and their associated cultural identities, which provide residents with an important component of their self-concept and contribute to a sense of belonging to a distinct and identifiable community, should be encouraged and promoted. An existing regional identity can also be developed in a way that facilitates year-round tourism ^[144].

Existing privately owned and managed “Edge Cities” and “New Urbanist” developments should be incentivized to allow greater public ownership, access, and diversity, and many need to be better connected to the rest of their host cities via mass transit ^[145].

Urban Governments

Urban governments are the primary level of government where sustainability actions can take place and be coordinated. They need significant resources to accomplish these goals, and where their own taxes plus national, state, or provincial governments funds cannot provide sufficient money, local government will need to seek them through other means. Besides higher taxes and regulations, which may be undesirable, urban governments can also fund research through local universities, work with local trade groups, and seek cleaner businesses as part of their industrial mix.

When national, state, and/or provincial governments fail to act appropriately, urban areas must act on their own. For example, every urban area in the U.S. should agree to implement the Paris Climate Accord in their jurisdictions and support the U.N. Sustainable Development Goals. In addition, urban governments of the Global South must free themselves from the shackles of outdated colonialism, sexism, and racism while providing equitable justice and protection for individual liberties ^[146].

Metropolitan residents should vote on their regional urban services, taxes, and planning. The electorate should encompass a sufficiently large area to allow for regional planning and place development, and from time to time may need to be realigned, or new multi-jurisdictional planning agencies should be created. This will allow a better alignment of voting interests and their shared sense of place with their urban economic, social, and infrastructure needs while also increasing the administrative efficiency of large infrastructure projects and minimizing the effect of outside interests at odds with urban needs ^[147].

Elections must follow the principle of one person, one vote, applied across all classes, ethnicities, races, and genders ^[148]. Public, in-depth discussion of issues should take place before a vote. Upon release, the convicted felons and other disenfranchised groups should be returned to their full voting rights ^[149].

Urban regime power relationships need to be refashioned ^[150]. The power of business interests and civic institutions must be fair and proportionate to public needs, in order to promote economic and environmental sustainability and improve quality of life across urban society ^[151]. Democratic representation can be increased through a variety of means, including political redistricting that enhances citizen representation instead of concentrating the power of any one political party, removing moneyed interested from politics, and the use of participatory budgeting to help encourage socially responsible civic investment, and a number of others, all of which would need to be examined and implemented with respect to local exigencies ^[152].

While affirmative action programs are needed to help those disadvantaged due to issues of social class, race, gender, disability, and economic condition, they must be designed and implemented in such a manner as to provide measurable progress and social cohesion ^[153].

As the global population transitions from largely rural to primarily urban, rural values of self-reliance, low taxation, and fear of government intervention will be supplanted with urban values that accept government action on behalf of the common good. This will likely further acceptance of higher levels of taxation, but only if urban policies actually succeed.

Individual freedoms and rights must be protected, enhanced, and enlarged where feasible, so as to secure the “right to the city”-the right of all citizens to access the city's resources, and in so doing, to transform the city and themselves ^[43,154]. While expanding freedoms starts with affordable housing, better education, and strengthened voting rights, we also need to:

- Enshrine everywhere the rights to freedom of speech, assembly, privacy, trial by jury, conscience, and movement
- Stop discriminatory policing ^[155]
- Appropriately regulate bulk data collection to better maintain the freedom of privacy
- Provide unrestricted access to the World Wide Web ^[156]
- Provide alternative pathways of intervention to incarceration for those whose transgressions have not harmed others, to minimize familial consequences, recidivism, and future violence ^[56,157]
- Ensure social justice ^[158]

In addition, urban governments can use their regulatory and tax authorities to affect changes within their jurisdictions, such as:

- Tax all packaging that is not 100% recyclable
- Halt all hydrocarbon pipeline and storage construction within their boundaries
- Increase taxes on hydrocarbons, and require all new power generation to utilize renewables
- Ease regulations for the introduction of on-demand self-driving electric vehicles and delivery services

Urban problems vary globally, so some regions will need to consider vastly different approaches to certain problems ^[105,159]. For example, those with aging populations may wish to encourage higher retirement ages, savings rates, and employee ownership rates. Those with high immigration rates will need economic integration and encourage social cohesion between newcomers and longstanding residents ^[160]. Those with shrinking and aging populations must find a way to disengage from the death spiral of declining employment, lower tax receipts, and thus delayed infrastructure maintenance and improvements before the point of crisis ^[161]. Those with high levels of poverty must find new ways to fund the infrastructure, health care, and education needed to help the poor help themselves ^[162]. Finally, when national, state and/or provincial levels of governments fail to act in the interests of the citizens of our urban areas, then urban areas should feel justified in taking action to correct such grievances. The example of many cities in the US to declare themselves Sanctuary Cities, and to commit to the Paris Climate Agreement shows the power these actions can take.

Quality of Life

The attributes that comprise quality of life-which include personal freedom, excellent health care with the prospect for a long life, proximity to close family and friends, an inclusive and equitable quality education, satisfying work, a strong sense of community, adequate leisure time, and availability of an energetic cultural life are universally and sustainably attainable through the implementation of appropriate urban policies. To do so, an urban society must set goals as well as a process to measure its progress towards those goals. While measures of GDP have been used in the past as a proxy for such societal progress, research shows this is a poor proxy. People do need to earn enough income to ensure their own well-being, as well as that of their families, but once that is achieved, people seek to increase their quality of life ^[163]. In fact, a preoccupation with material wealth and the acquisition of consumer goods undermines wellness ^[33]. In addition, National governments who are in control of monetary policy and the national budget are in a much better position to affect the gross level of economic activity of national and regional economies than cities. Therefore, urban areas should place their focus on enhancing their citizens' quality of life. By expanding and diversifying their public and collaborative commons, providing options to accommodate a wide range of work-life balances, plus supporting those institutions and policies that will enhance the arts, culture, education and health care they will work towards that end. To enact such a strategy urban areas will need to:

- Provide a collaborative commons of shared resources with sufficient amenities free or at low cost, and encourage a sharing economy to allow the use of various goods and services at low cost to area citizens ^[65]
- Incentivize and encourage traditional community work parties (i.e. barn-raising), coops, urban neighborhood associations, etc. with fast-track permitting and shared community resources for park projects, community resources maintenance, habitat for humanity style low-income housing, etc. for projects seen as needed at the most local of levels
- Incentivize and encourage experimentation with sharing networks while monitoring their progress in order to provide both assistance and direction ^[164,165]
- Adopt measures of personal satisfaction (aka happiness) that can be used to both measure and direct urban area's progress, as opposed to GDP. Potential measures include Bhutan's Gross National Happiness Index Buen Vivir (Vivir Bien) or sumac kawsay, Ubuntu, and a number of others ^[50,51,53,106-108,110,111,159]
- Improve and more evenly distribute health care, including technological advancements. A free basic medical care program for the disadvantaged can be provided as part of the public commons ^[166,167]
- Encourage a healthy diet and tax and/or regulate foods known to lead to poor health outcomes ^[92]

- Learn from the mistakes of the UN Decade of Education for Sustainable Development by implementing and monitoring an enhanced education program for sustainable lifestyles ^[168]
- Incentivize family formation and maintenance, especially in the US ^[169]
- Encourage reduced work weeks and larger time-off packages, starting with city employees
- Enhance public education via magnet schools, school choice, and improved teacher training and support ^[170]
- Incentivize colleges, research centers, etc. across a wide band of creative and new technology fields as a way of promoting job growth ^[171]
- Increase the time spent in art, music, theater, and languages in primary schools and bring artists into classrooms more frequently
- Incentivize culture factories such as fashion, music, film and video, museums plus arts and artist housing districts, etc. to enhance urban vitality, history, and memory ^[172]
- Consider corporate interests in education and culture within the larger umbrella of society's needs, rather than supplant them
- Limit public advertising (as opposed to signage) to entertainment venues such as Times Square in New York City
- Work with existing religious institutions and other spiritual groups to foster sustainable lifestyles within their communities ^[173,174]
- Incentivize lifestyle diversity by eliminating regulatory barriers to alternative paths of life, while encouraging monasteries, intentional communities, communes and "simple living" ^[87,175-177]
- Encourage and enhance the values, cultures, and life-ways of non-Western societies, cease the attempt to convert them into materialistic consumers or otherwise part of Western culture while assisting them in finding ways to sustainably maintain their cultures
- Where possible, experiment with new political ecologies ^[45,178]

A low-cost, high-quality education must be available to all. Where colleges cannot be located near the populations they serve, web-based, free education needs to be available to all, for both the benefit of individuals and the sake of society. We must educate future generations not only for the jobs that will be available for them, but also to be citizens in the best sense of the word: literate, compassionate, and understanding of their ethical relationship to the world around them ^[87].

Urban Planning and Design

Most of the world's population now lives in urban areas, and our cities manifest the most sustainable way large populations of people can live. So we must design into our cities an urban lifestyle that will attract as much of our population as possible while incorporating the most advanced sustainability policies available. This requires first that urban planning and design must make our cities more vital and attractive places to live and work and second that all of the strategies mentioned above need to be incorporated into the planning and design of our built environments. In this way, we can empower state of the art environmental, economic, political, and cultural policies, while we upgrade and expand our urban infrastructure ^[179,180]. Cities would wisely consider those policies that would attract the "creative classes" as identified by Florida as necessary to foster and maintain a more dynamic urban economy ^[181]. Such enhanced urban vitality can be stimulated via downtowns and nodes with:

- A variety of uses (retail, entertainment, office, residential, educational, and cultural) in close proximity to each other, which will also enhance jobs/housing balance ^[142-184]
- Use the General Plan and Zoning Code to decentralize employment from downtown cores and enhance the jobs/housing balance at neighborhood and community level
- Sufficient density to keep sidewalks lively throughout the day and evening ^[185,186]
- Enhance pedestrian only/priority areas as well as bike lanes
- An urban streetscape made both attractive and lively due to a sufficiency of density, continuity, and diversity with interesting and attractive landscaping, greens, parks, as well as the availability of a collective commons of art and culture ^[182,187]
- Mass transit and bike-shares connecting downtown, nodes, and the denser corridors of our urban fabric ^[183,188]
- Zoning incentives for developers to offer space to non-profit organizations at low rents ^[189]
- The enhanced inclusion of low-income residents to city centers via affordable housing in them, plus mass transit linkages and correspondent zoning code modifications ^[190]

- High-performance networked infrastructure ^[191,192] enhanced through digital analysis of all interrelated urban systems ^[113,193,194].
- Existing “Edge City” nodes will need to be better incorporated into their surrounding urban fabric. This will generally require a much higher degree of residential units within their use mix and mass transit to better connect them to their surrounding urbanity ^[145,195]
- By fostering community life and promoting the design of regionally sensitive architecture and planning and facilitate “beautifully poor” urban experiences ^[196] we can encourage a sense of place in our communities ^[197]. Improving the public commons will further increase our sense of connection and bonding to place. A sense of community and belongingness cannot happen in a sea of sameness ^[198]
- We need to embrace our cultural histories and collective memories. The myths, philosophies, religions, buildings, institutions, and urban fabric of the past add to our understanding of our society and ourselves, advancing the potential for societal and cultural progress ^[17,199]. The existing urban fabric needs the support of planners to maintain its vibrancy and vitality for future generations ^[200]

Each urban region will need to decide how to handle projected population growth without creating more sprawl ^[30]. Options range from creating entirely new cities (such as Brasilia) to revitalizing and expanding existing downtowns (such as New York City beginning in the 1990's). Between these two extremes are many alternatives. Existing suburban and urban arteries and nodes can be transformed into new urban centers through increased density along corridors of mass transit (i.e., Transit Oriented Development) ^[190]. Existing highways can be transformed into mass transit corridors, either with light rail transit, dedicated bus lanes, or, in the near future, dedicated autonomous vehicle lanes. New towns, edge cities, and suburban retail and office centers can be urbanized and connected to promote diversity and density within the urban region without increasing its overall footprint.

While many cities still need to create or expand mass transit systems, the approaching transportation revolution of ride-hailing, self-driving electric vehicles is fast approaching. Electric vehicles will drive 3 times as many kilometers and have maintenance and fuel costs only 1/5th as much as their gas-fueled counterparts. Stage 4 vehicles will be able to serve individual cities, Stage 5 will be able to roam suburban and rural areas as well. Entire fleets of such vehicles are anticipated to be launched at our cities in large numbers beginning in 2025. Cities will need to regulate these fleets so that they operate primarily with mini-vans set up for ridesharing, in order to minimize traffic problems, and with designated parking areas for off-hour storage in order to eliminate on-street roaming during such hours. Given the economics and convenience, it is quite likely that 90 to 95% of all kilometers driven will be via such transportation in a 10 to 20 year period of time. Once that occurs, urban citizen transportation costs will drop considerably, and on- and off-street parking will no longer be needed in the quantities we presently have them in our cities. This will open up a vast amount of urban land for both increased density and open space, with the potential to greatly enhance urban vitality ^[74,201].

Low-income areas with widespread poverty must be fully integrated into the urban fabric, granted full access to mass transit, sanitation, healthcare, public commons, education, public administration centers, and public safety ^[202,203]. Once this commitment is in place, cities can realize successful urban revitalization programs, which, unlike urban renewal programs that foster gentrification, should include education, jobs training, entrepreneurship, and small business loan programs to increase incomes of existing community residents, as well as the creation of dispersed, small to medium sized affordable housing projects to assist existing community residents stay in place as older housing is remodeled or replaced.

Providing for those both jobless and homeless in urban economies that will be losing jobs to automation will need to be transformed, or the size of the problem may become unsustainable. Value judgments that the homeless are with us because they don't want to work will need to be replaced with an understanding that the economy is changing rapidly, and leaving too many behinds. Cities will need to set up therapeutic, educational and jobs training programs, incentivize businesses and government departments to hire the formerly homeless once they've graduated, plus provide the additional affordable housing these people will need once stabilized.

Urban recycling management infrastructure should be upgraded to state of the art in an urgent, but realistic timeframe given resources and other needs, as 100% sustainable recycling is not yet feasible. However, this target will become more attainable as urban governments set future timetables for the progressive attainment of more fully recyclable product content and as recycling technology mature ^[204].

To compliment this planning agenda, open space in the rural areas that surround urban cores should be preserved through a combination of subdivision requirements and open space easements ^[205]. These open spaces and their ecologies can then be connected via green belts to each other and to urban forests within our metro areas, and cohesively connected throughout the inner city via urban parks and gardens, street trees and rooftop gardens. This will help to clean the air, keep our cities cooler in the summer, and help reconnect city dwellers especially to that ecology of which we are all part. Encourage food production within the city by offering zoning incentives for greenhouse and rooftop agriculture, as well as lot purchase programs for cooperative gardens throughout the region.

Property tax and building code incentives for building owners to convert existing buildings to be more sustainable, in terms of increased insulation, conversion from gas and oil fuels to all electric, and to more efficient heating and cooling systems.

Enhance water systems via the building code for greater in-ground retention of rainwater runoff, reduction of water consumption, and greater use of grey water for landscaping. In addition, continually work to enhance the efficiency of both public and private water treatment facilities.

Given the recently initiated transformation to vastly increased autonomous ride-hailing and sharing services, reduces parking requirements immediately wherever possible, together with the allowed conversion of existing parking areas to green space, agricultural production, or increased density. Encourage ride sharing via relaxed parking restrictions and lower taxes in order to free city streets from as much congestion as possible.

While the cost of construction will always be higher in denser urban areas, the land component of new building costs accounts for approximately 80% of the rise in housing costs since the end of World War II ^[206]. Floor area rations should be zoned for anticipated growth, and then these areas can be appraised and taxed as if they were already built out. This will make land speculation more expensive, reducing land costs and encouraging more affordable building projects.

CONCLUSION

Among the Earth's geologic ages, some were sustained over millions of years, while others were transient. Hopefully, the knowledge that the global community can consciously manage the emergent Anthropocene Age will motivate us to implement the changes necessary to establish sustainable urban societies-and thereby a geologically sustainable human civilization. In many parts of the world, these changes will likely initially manifest in a variety of discreet urban areas, utilizing a diversity of paths, providing later cohorts of cities both guidance on how to walk the paths of sustainability, the evidence of their successes. Freed from the addictions to wealth and consumer goods in our emergent post-materialist society, necessary to create global sustainability, the world's citizens will be able to find the freedom, space, and opportunities to create their own collective and individual destinies.

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