

## The exponential increase in the production of palm oil is causing grave damage to the environment and rural communities in areas of cultivation

In the photo on the opening pages, *Clearcut #1*, amorphous crop circles hint at an alien power, as they consume a verdant forest. The landscape is a scene of opposition – artifice and nature, the virginal and the ravished – yet the antagonists in this conflict are faceless. The photograph reeks of human touch, without evidence of who wreaks it.

Plantation agriculture is ecological violence. Globally, oil palm plantations have razed 27 million hectares of forest, an area the size of New Zealand.<sup>1</sup> Given the crop's equatorial growth zone, these monoculture plantations replace some of earth's most biodiverse rainforests. In Indonesia, the world's main producer, fires lit to clear forest for planting triple the country's net carbon emissions. Annually, they drape a toxic smog over Southeast Asia, killing 100,000 people in 2015.<sup>2</sup>

Palm oil's rise is staggering: a 23-fold production increase from 1970 to 2010,<sup>3</sup> now set to repeat in just a decade. As the cheapest fat to produce, palm oil is put in most processed foods. Refined into oleochemicals, it gives soaps and detergents their lather. In the 2000s, the US and EU created a massive new market for the crop by increasing the share of biofuel added to gasoline. Recognising

globally, the market for palm oil is booming.

A consumer in Singapore does not know the chocolate bar in her hand is the reason she has to remove her face mask to eat it.

Oil palm can be four times more productive than other oil crops, but achieving this requires a precise supply chain. Seeds, cross-bred in laboratories to create the high-yielding *tenera* variety, are germinated in controlled conditions before the sturdiest seedlings can be planted. It will take three to five more years of investment before the trees yield fruit. A plantation worker harvests several hundred 10- to 40-kilogram fruit bunches a day, which are then trucked to a nearby mill. The fruit must be milled within 24 hours to avoid growing acidic. From here, oil goes to a refinery for processing before being shipped off to the factory.

The 24-hour limit for bringing fruit to mill is materially inscribed on the landscape, in paved roads and industrial sites. So too is the meticulous regime for forest management, with trees spaced to optimise yields, and simplify fertiliser and pesticide application. Enormous patchwork grids of palm across Sumatra, Borneo and the Malay Peninsula can be seen from space.

Critical geographers use the term "planetary urbanisation" to describe the ways corporate production and extraction subsume territories far beyond city limits.<sup>4</sup> Cities may appear as isolated dots on a map, yet their continued growth demands ever-larger zones of support. In Indonesia's Riau Province, 28 per cent of the total land cover – half, in some sub-districts like Rokan Hulu – bears the texture of palm cultivation.

*Clearcut #1* captures this process of urbanisation, but its aerial perspective cannot tell the full story. Outside the frame are the labour camps, empty villages and plantation offices. Confronted

A sinistra: pedoni nella Marina Bay di Singapore sullo sfondo del quartiere centrale degli affari avvolti dallo smog causato dagli incendi boschivi Indonesiani, appiccati per incrementare le piantagioni di palme da olio, settembre 2015. Pagina a fronte. In alto: gli effetti dell'incendio di una foresta a Bukit Tigapuluh, Sumatra, Indonesia, provocato dai produttori di olio di palma. In basso: raccoglitori dei frutti di palma nella piantagione del villaggio Kuwala, distretto di Kutallimbaru, Deli Serdang, Sumatra Settentrionale, Indonesia, gennaio 2017

Left: pedestrians shrouded in Marina Bay with the central district in the background was caused by Indonesian which were expand the plantations 2015. Opposite page effects of a Bukit Tigapuluh, Sumatra, Indonesia, started by palm oil. Back of oil palm plantation village in the district, Deli Serdang, North Sumatra, Indonesia, January 2017

precariousness of a new labour regime emerges. We must interrogate the social destruction, and descend from the view to indict ourselves.

Oil palm plantations are lonely labourer works six to eight hectares blocks sit isolated. Older villages, still cropland, are mostly empty. Company labourers brought in from afar, without kinship ties and are less able to better working conditions. Malay estates employ an estimated one million workers, mostly Indonesian. For day, they carry out the back-breaking labour of spraying toxic chemicals on fruit bunches; their job tenure is tenuous, releasing employers of their responsibility for workers' rights or benefits. The conditions is to court death. In Colombia leads oil palm's expansion into Latin America land rights activist Hernán Bedo palm oil companies and was one of the activists brutally killed in 2017.<sup>5</sup>

Bulldozers do not carve this scene of virgin landscapes. For centuries communities in Indonesia have practiced agriculture in the forest, cycling hill rice, cash crops and jungle leaving plots fallow between uses to regenerate. But legal frameworks in Indonesia only recognise this custom on tenuous grounds. Fiscal decentralisation pushed district governments, in the tax revenues (and personal kickbacks) over indigenous lands to agro-industrialisation lies the human violence of oil palm plantation erases rural livelihood practices, and displaces communities bare the brutality of development the supposedly inherent spread



access to (and use) alternative transport provided by employers is far smaller than those who commute to work daily by car. A comprehensive political commitment is necessary to overcome the resistance of local communities to major transport infrastructure schemes, but this remains incredibly complex to achieve.

Moving to a different context, Zurich in Switzerland has one of the most efficient surface transport systems in Europe and among the highest rates of public transport usage in the world. The network encompasses a radially oriented system that connects the centre with the outer municipalities.

This is supplemented by a secondary system in which line-haul buses and intercity rail are all linked up to major stations, with the result that waiting times between transfers are greatly reduced. These two layers are then integrated with a third fine-grain network of tram lines that circulates within the dense built-up areas.

Much of Zurich's success with public transport has to do with the details of the system design and with the measures put in place to encourage certain behaviours. Roads have been partitioned and facilities micro-designed to give clear priority to public transport vehicles; segregated lanes for trams and buses account for approximately half of the total road space; and parking provision is almost completely off street and expensive.

There are many cities around the world where development and commuting patterns have increased sprawl significantly.

Dares Salaam is the former capital as well as the most populated city in Tanzania and one of the fastest growing cities in the world. The city

is served by two urban and suburban commuter rail lines but can also count on a bus rapid transit (BRT) system that began operations in 2016.

The currently available BRT is spread over three routes serving a total of 29 stations. This has dramatically changed the conditions of mobility in the city, reducing traffic congestion while providing many people with a transport means.

Dar is evidently not the only city to have successfully implemented a BRT. But what is striking about Dar is the limited level of segregation of the transit corridor, which allows pedestrian permeability to be retained: an essential condition for the quality of urban roads and streets. Examples of recently implemented BRT schemes that do not offer such a high level of permeability include Addis Ababa and the project in Lima.

To conclude, much of the way a city is organised has to do with the way we move around.

With the arrival of mass car ownership in the mid-20th century, engineers' approach to street design applied the principle of inverse correlation between access and movement. The intention was to allow vehicles to move from one road to another with minimum deceleration. A corollary to this principle is that roads as spaces for movement should be physically separated from standstill spaces and classified by function and speed to maximise free flow.

What we are looking at today is fundamentally an attempt to reshape some of that system and partially rebalance the allocation of space among the different modes of transport and activities. We went through this process 100 years ago but now things appear to be shifting again. Streets serve a much broader purpose than just facilitat-

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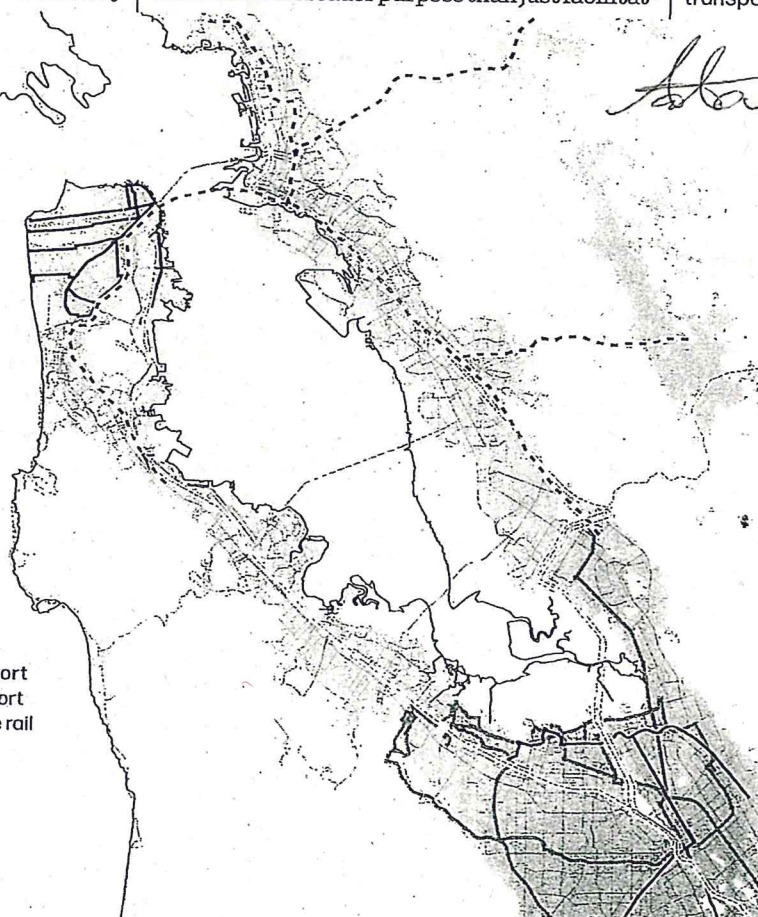
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Silicon Valley



Linea di bus locale/Local bus line  
Impronta urbana/Urban footprint

Tipologia di trasporto/Type of transport  
Altro mezzo di trasporto/Other transport  
Ferrovia lunga distanza/Long distance rail

Frequenza/Frequency  
Meno di 10 min/Less than 10 min  
10-20 min  
20-30 min  
Più di 30 min/More than 30 min

*Marco Parolotti*



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In terms of continuity with the past, prolonged  
urbanisation processes and the growth of cities,  
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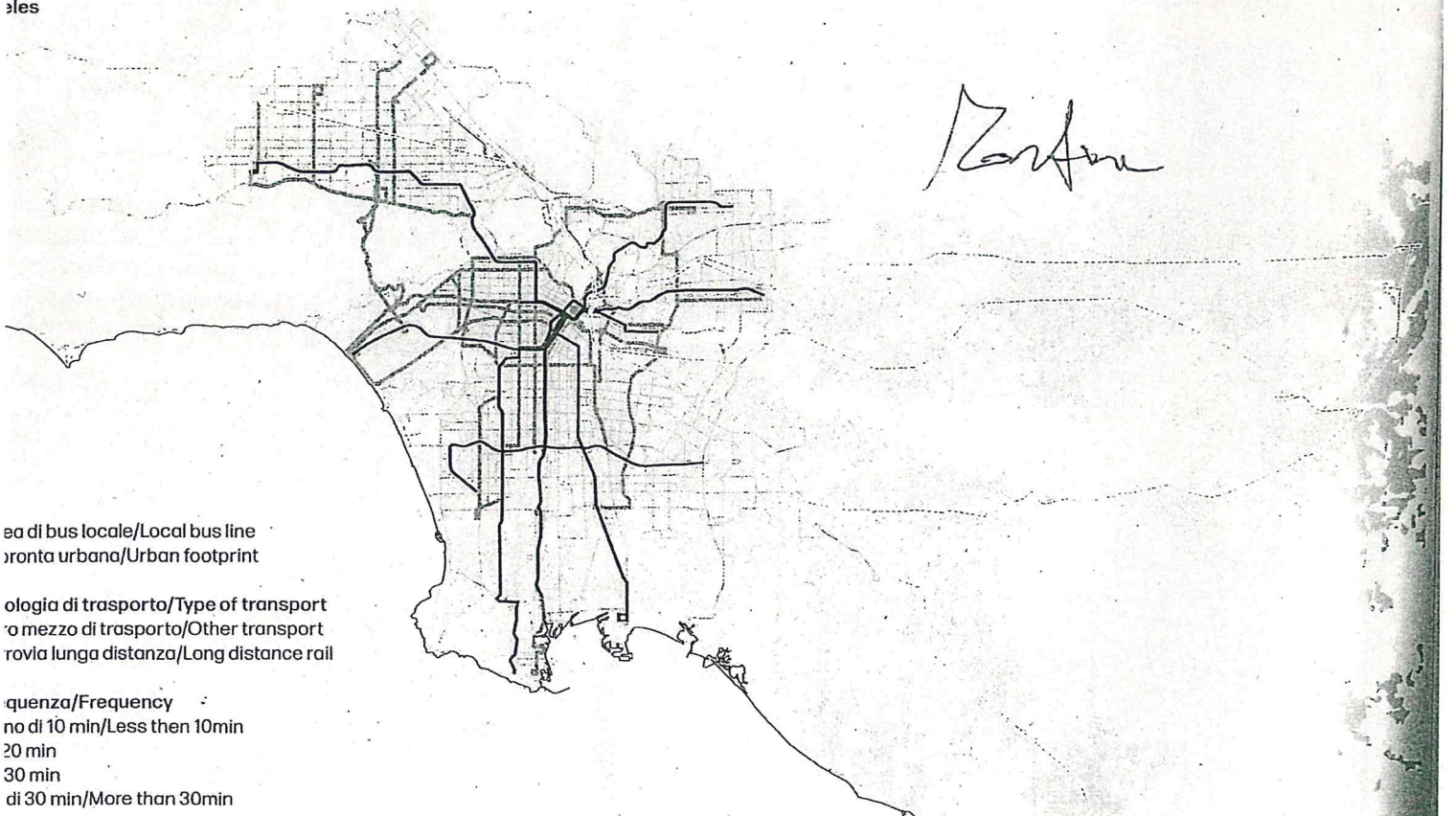
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# Architects join forces with horticulturists, landscape designers, biologists and climate engineers to cultivate a new urban nature

Back in 1980, in Richmond, architect James Wines saved a stripe of urban forest and created an unforgettable storefront, all in a single move. He just cut the facade off the rest of the building and let the trees occupy the in-between space.

Over the past 15 years, German architect Ferdinand Ludwig has crossbred engineering and botanics to test the capacities of "living plant constructions" in which the supporting structure is made of interconnected trees.

Trees are not the only thing these projects have in common. By making nature central to the design concept, you create a "hybrid reality", a meeting point between nature and architecture. Urban life holds too many advantages for most of us to give it up and go "back to nature". But is this really an either/or situation? Does it even make sense to juxtapose the two? We may not be able to recreate a genuine forest in the city but this does not mean that city and nature are incompatible.

There are ways of bringing together nature, architecture, and technology so that they can coexist and cooperate, and such work is already in progress. Joining forces with horticulturists, landscape designers, biologists, and climate engineers, architects are seeking to "knit" nature "into the very substance of buildings" (as Peter

Cook once said). They are cultivating a new, urban nature, or urbanature. In fact, Wines' project, unparalleled as it was, is not the earliest instance of urbanature in contemporary architecture. A number of remarkable examples emerged in the 1970s, including a residential complex in Madrid designed by Fernando Higueras and Antonio Miró for the Military Housing Foundation (1975); Les Etoiles d'Ivry, a large mixed-use project by Jean Renaudie and Renée Gailhoustet built in 1970-1975 in the Parisian suburb of Ivry, and the Planeta (originally, Banca Catalana) building in Barcelona by Josep Maria Fargas and Enric Tous (1978).

In the military housing, vegetation incorporated throughout the building compensates for the scarcity of trees on the streets and brings in the sensory abundance typical of Higueras's architecture. A radical take on urban planning and social housing, Les Etoiles d'Ivry reflected Renaudie's "biological" vision of the city as a complex, living organism. On a more individual scale, its garden terraces with vegetation flowing over the concrete balustrades blended urban and countryside feels. Direct experience of nature

— regardless of the floor one is on — together with an opportunity to connect with neighbours. As for the project in Barcelona, it is nothing less than Barcelona's first vertical garden. The building's nine floors is hooped with planters with a combined area of 1,500 square metres. Biologists Jordi Aguilà and Xavier Gual developed a pioneering hydroponic system to feed this hanging garden, which also selected the species for a natural enclosure where different plants grow alive at different times of the year. A particularly poetic example of this is architect Takashi Fujino (Ikimono) office and garden under a 10-metre-high roof. The concrete structure has large glazed openings providing a large amount of physical comfort and is generous in the way it engages with nature, Fujino says. In spite of its modest scale, it points to many aspects of urban nature.

## Alternative locations for natural urban centres with no space for trees

One well-known solution is to look for space as in Stefano Boeri's scheme for the residential towers provide a two-hectare forest on a 1.50-hectare site.

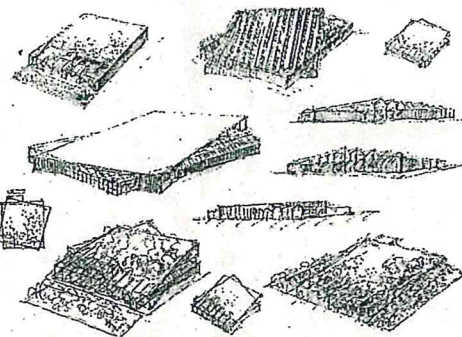
Meanwhile in New York, a terminal has been chosen as the world's first subterranean forest. Central to the project is a so-called "root system" developed by James Wines (see page 10). The system harvests rainwater and channels it underground as would be good enough for the trees.

Likewise, the Lowline opens up new possibilities in horticulture. To define a "subterranean forest", Mathews Nielsen, John Mather and Brooklyn Botanic Garden consider multiple parameters: light levels, soil conditions, the project is currently in the early stages. In the meantime, some technology has also been installed and some cities in UK and Belgium have initial concept designs for the project.

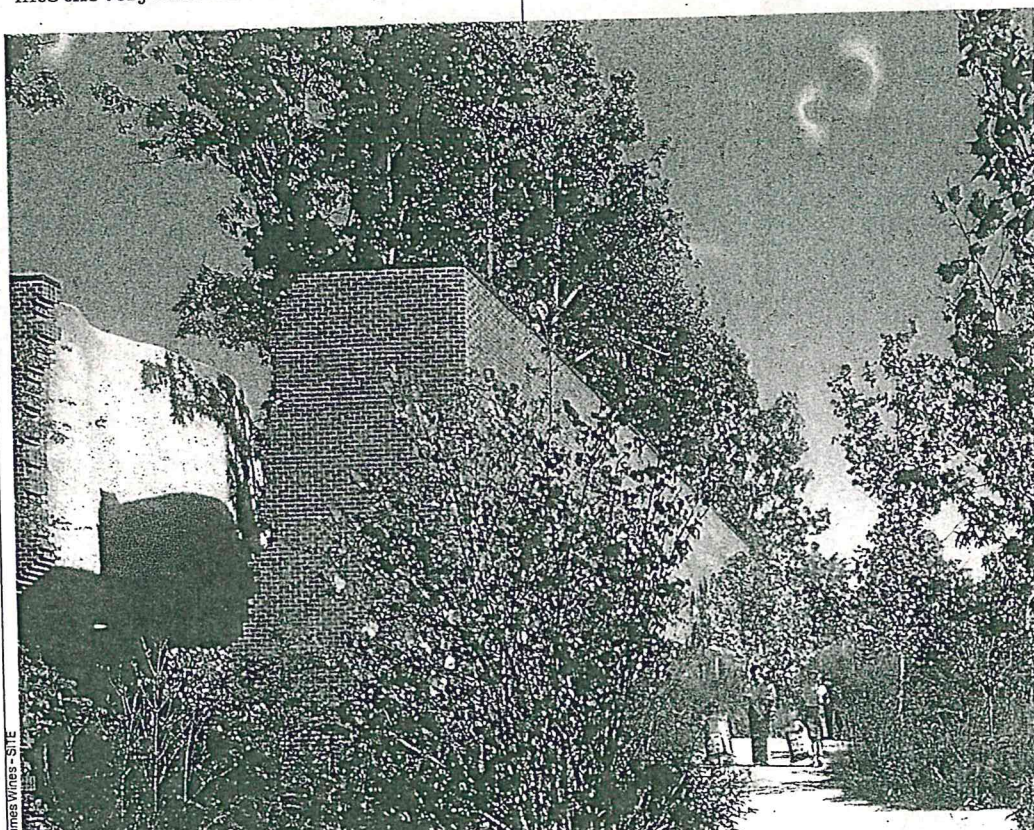
## Can buildings be growth-friendly?

Different epochs have different demands on architecture. In the third of the population in cities, the demand is to provide accommodating life — not just for living beings in general, but for people, principal at Charteris Design.

Their school in Boulogne-Billancourt has a thriving rooftop forest a concrete facade with grooves for plants, birds, and insects. In the Boulogne project, the team is developing a facade system with soil-



© James Wines - SITE



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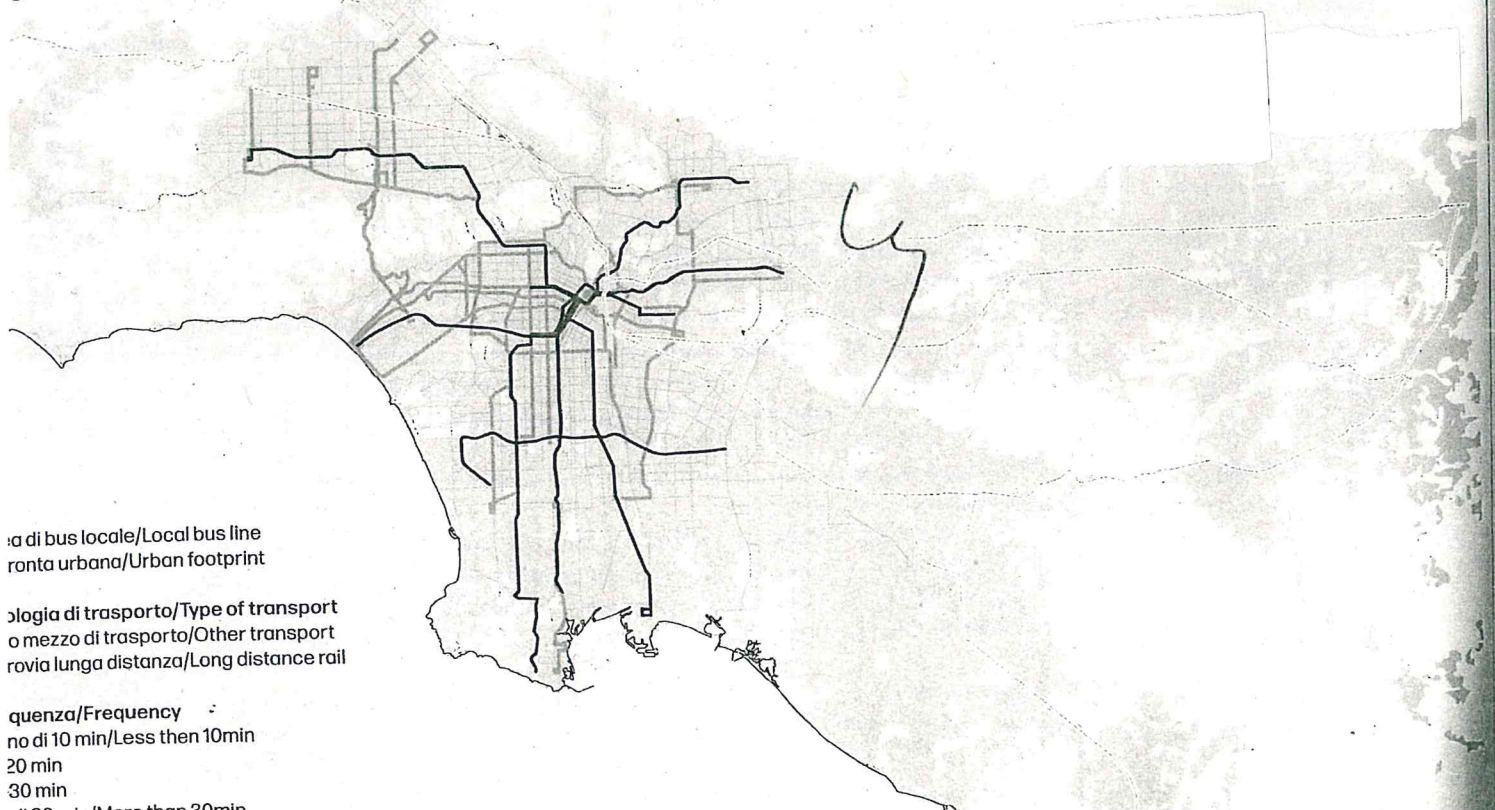
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Committee on the Environment, Public Health and Food Safety adopted a resolution banning the use of single-use plastic items. From 2021, plastic bags, plastic beverage stirrers and take-out packaging will be banned in the European Union. By 2025, plastic ice-cream and sandwich containers are to disappear.

France has also announced a charter to fight plastic waste on beaches. The long-term objective of this action is "zero plastics discharged into the sea by 2025."

Environmentalists and activists have been raising the global problem of the excessive production of disposable plastic for many years. Why did we have to wait so long for legal actions intended to stop the littering of our planet that has long been out of control?

#### The history of plastic

Plastic is a colloquial term for all synthetic materials produced via the chemical modification of natural materials. The history of plastic began in 1851 when Nelson Goodyear patented ebonite, used for example in the production of insulating elements. PET, the most common thermoplastic polymer, was invented in 1941. The first PET bottle was made in 1973 by Nathaniel Wyeth.

Only four years later, PET bottles pushed the previously used glass bottles out of the market. In the second half of the 20th century we chose disposability for the sake of convenience. We usually do not think about the fate of a used PET bottle or coffee cup.

It is easier to order a take-out in a polystyrene box than to bring a reusable container from home. This is, of course, damaging our planet and the natural environment.

Alvin Toffler diagnosed this problem in 1970 in his book *Future Shock* where he stated that we are a throw-away society.

Reusable glass bottles and cloth shopping bags were in common usage just a few years ago. Disposability is still on the increase. Over the last ten years, we have produced more plastic than in the entire last century.

It takes up to 500 years for a PET bottle to decompose. For a better understanding, imagine a bottle thrown out by Elizabeth I of England in the 16th century only decomposing today.

After 500 years a bottle is still not fully biodegradable. It breaks down into microscopic particles and pollutes the environment. Sea-fish mistake so-called microplastic floating in the water for plankton. It enters the soil from biodegradable plastic bags and the digestive system of animals. People and animals inhale tiny pieces of plastic floating in the air.

Researchers estimate that over 50% of the population may have microplastics in its gut. Further studies are needed to learn what this discovery means and what diseases it may cause.

Recycling is not enough

Over one million plastic bottles are sold

plastic production amounts to 78 million tons but recycled plastic only amounts to 2% of this. The potential of recycling is limited - only some types of plastic are recyclable and, in each case, it is the conversion of the raw material into a lower-quality material. So, plastic cannot be recycled endlessly.

Overproduction results in the export of used plastic from developed countries to developing ones such as India, Nigeria and China. The EU's radical resolution banning the single-use plastic was definitely expedited by the Chinese ban on imports of used plastic introduced in January 2018 and which triggered a crisis in the global waste economy. Until then China had received 45% of global plastic waste.

China has now banned the importation of plastic and paper packaging as well as car-body parts, chemicals, electric cables and large-volume waste from the European Union. The system's inefficiency expands the grey area and the scope of the garbage mafia which profits from the illegal purchase of waste (usually burnt afterwards) and illegal recycling. Poland, for example, became an area of such illegal action. It costs around 250-300 Polish złotych (57-68 Euros) to take a ton of waste into a landfill in Poland. If 50,000 tons of waste were burnt in a fire in a rubbish dump in Zgierz, the potential profit from accepting new consignments in its place would be 15 million Polish złotych (3,500,000 Euros). The number of fires at Polish landfills grows every year.

The Great Pacific garbage patch is also growing fast. This is a patch of waste created by ocean gyre in the North Pacific Ocean. 99.9% of the "island" is made of plastic and it covers an area of 1.6 million square kilometres - bigger than Canada.

#### Time for change

How will the ban introduced by the European Parliament affect our lives? It will probably make little difference to ordinary citizens: plastic packaging in stores and restaurants will be replaced by eco-friendly alternatives.

However, entrepreneurs who have to change their practices face the biggest tasks. From a business point of view, companies producing plastic packaging will lose out the most although there is huge potential: the production and distribution of eco-friendly packaging is still a niche area that has to be filled as quickly as possible.

The problem is not plastic itself which is not a bad thing as long as it is properly used. Our planet struggles with disposability and so substituting plastic single-use items with other single-use items is only a partial solution to the waste catastrophe. We should change our habits and use our own coffee cups, water bottles, reusable bags and food containers on a daily basis. Organic single-use bags should be the final choice.

The creative industry is also facing a major

Opposite page:

"Pla-Kappa:

A Cautionary Tale  
of Accumulation"

by Tel Carpenter, Arianna  
Deane and Ashely Kuo  
(Agency-Agency),  
winner of the "LA+  
Imagination" ideas  
competition to design  
a new island, organised  
by LA+ Interdisciplinary  
Journal of Landscape  
Architecture.

The project by the New  
York studio imagines  
life on the island  
of Pla-Kappa, consisting  
in 150,000 km² of organic  
matter and accumulated

human-made waste  
in the ocean currents  
of the North Pacific.  
Its surface has become  
home to an extreme  
ecosystem with endemic  
species that have  
adapted to their new  
habitat such as mutant  
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# The future of urban mobility most likely result in a mixture of continuity and change. What, in transport terms, is going to change and what is most likely to stay?

Mobility is an essential feature of our cities. It mirrors our lifestyle and it is simultaneously cause and effect of urban life.

Although technology has enhanced what we can achieve without leaving our homes, we move and have things moved possibly more than ever before. Furthermore, our mobility needs have collective consequences: pollution, congestion and noise.

With the automotive industry on the cusp of a technological revolution, it may well be that the mobility systems of the future will be different from what is in place in most of the world today. At the same time, however, it is safe to assume that some fundamentals will not change.

The need to cut emissions and use energy resources efficiently, for example, is leading us towards vehicle electrification.

The possibility of reducing the number of accidents, meanwhile, is inspiring the development of autonomous driving solutions. The first self-driving vehicles expected on the market by the mid-2020s will have twofold consequences. On one hand, they may well encourage even more

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Nowadays, however, a whole variety of non-traditional means of mobility – such as vehicle sharing schemes – are cropping up in our cities and are proving popular. Car sharing services such as Zipcar or Car2go are making it easier for people living in urban conurbations not to own a car, while scooter and bike sharing schemes offer personal mobility solutions tailored to individual needs. These, along with companies offering peer-to-peer taxi services such as Uber, Lyft and others, are in many ways redefining the future of public transport.

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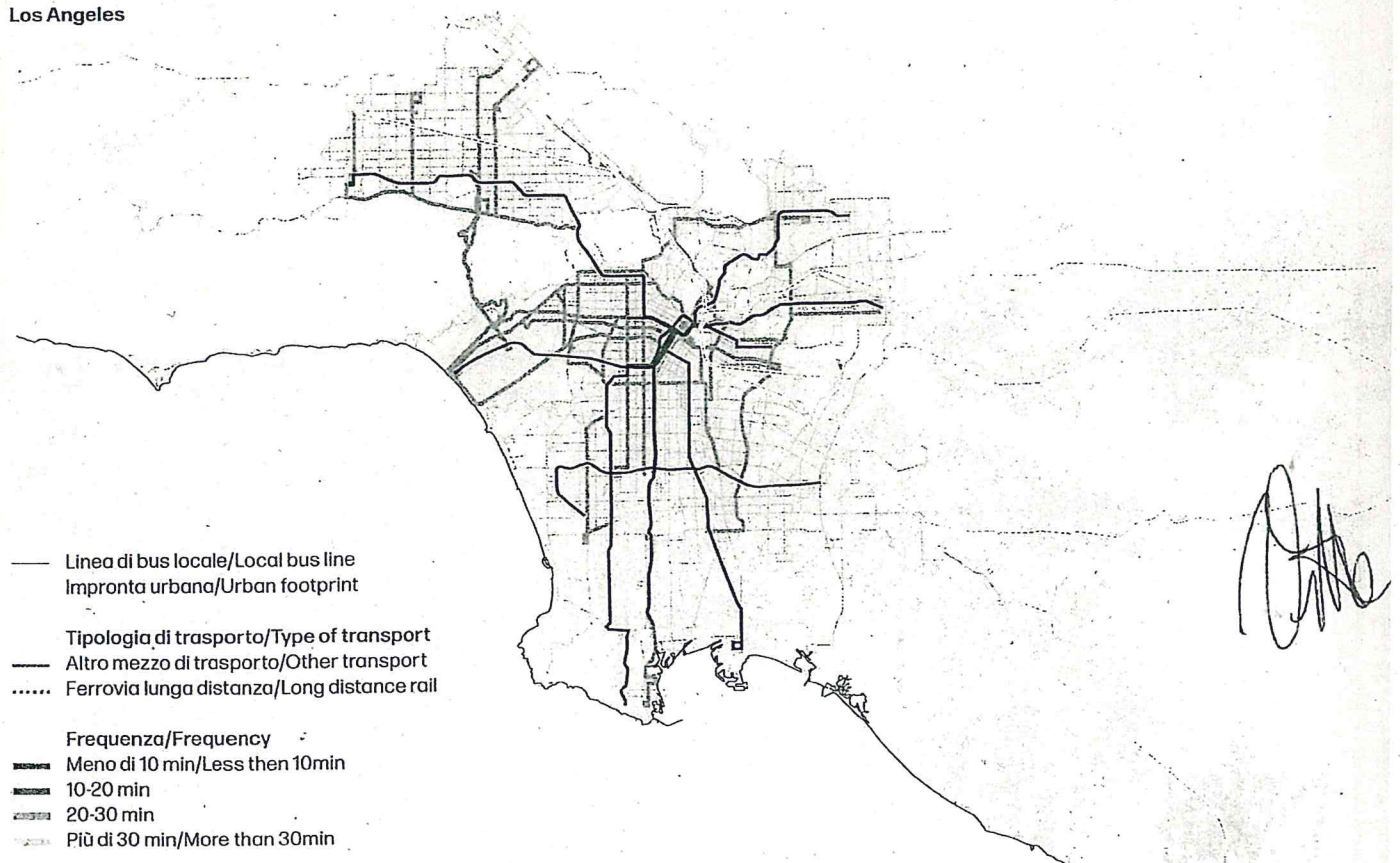
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Pagina a fronte:  
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 On 10 October 2018, the European Parliament Committee on the Environment, Public Health and Food Safety adopted a resolution banning the use of single-use plastic items. From 2021, plastic bags, plastic beverage stirrers and take-out packaging will be banned in the European Union. By 2025, plastic ice-cream and sandwich containers are to disappear.

France has also announced a charter to fight plastic waste on beaches. The long-term objective of this action is "zero plastics discharged into the sea by 2025."

Environmentalists and activists have been raising the global problem of the excessive production of disposable plastic for many years. Why did we have to wait so long for legal actions intended to stop the littering of our planet that has long been out of control?

#### The history of plastic

Plastic is a colloquial term for all synthetic materials produced via the chemical modification of natural materials. The history of plastic began in 1851 when Nelson Goodyear patented ebonite, used for example in the production of insulating elements. PET, the most common thermoplastic polymer, was invented in 1941. The first PET bottle was made in 1973 by Nathaniel Wyeth.

Only four years later, PET bottles pushed the previously used glass bottles out of the market. In the second half of the 20th century we chose disposability for the sake of convenience. We usually do not think about the fate of a used PET bottle or coffee cup.

It is easier to order a take-out in a polystyrene box than to bring a reusable container from home. This is, of course, damaging our planet and the natural environment.

Alvin Toffler diagnosed this problem in 1970 in his book *Future Shock* where he stated that we are a throw-away society.

Reusable glass bottles and cloth shopping bags were in common usage just a few years ago. Disposability is still on the increase. Over the last ten years, we have produced more plastic than in the entire last century.

It takes up to 500 years for a PET bottle to decompose. For a better understanding, imagine a bottle thrown out by Elizabeth I of England in the 16th century only decomposing today.

After 500 years a bottle is still not fully biodegradable. It breaks down into microscopic particles and pollutes the environment. Sea-fish mistake so-called microplastic floating in the water for plankton. It enters the soil from biodegradable plastic bags and the digestive system of animals. People and animals inhale tiny pieces of plastic floating in the air.

Researchers estimate that over 50% of the population may have microplastics in its gut. Further studies are needed to learn what this discovery means and what diseases it may cause.

would fill one garbage truck with plastic production amounting to 100 million tons, but recycled plastic only 10 million tons. The potential of recycling types of plastic are recycled it is the conversion of the lower-quality material. Some recycled endlessly.

Overproduction results in plastic from developed countries such as India, Nigeria and others. A radical resolution banning imports of used plastic into the waste economy. Until then 45% of global plastic waste

China has now banned plastic and paper packaging parts, chemicals, electric equipment's inefficiency expands the scope of the garbage mafia (the illegal purchase of waste afterwards) and illegal recycling, example, became an area of waste. It costs around 250-300 Polish Euros) to take a ton of waste from Poland. If 50,000 tons of waste a fire in a rubbish dump in 2018, the potential profit from accepting waste in its place would be 15 million (3,500,000 Euros). The number of landfills grows every year.

The Great Pacific garbage patch is growing fast. This is a patch of waste in the North Pacific Ocean. The "island" is made of plastic and covers an area of 1.6 million square kilometers in Canada.

#### Time for change

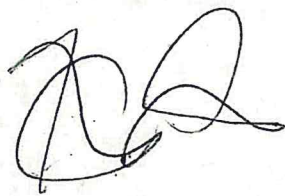
How will the ban introduced by the European Parliament affect our lives? It will make a little difference to ordinary consumption. Packaging in stores and restaurants will be replaced by eco-friendly alternatives.

However, entrepreneurs whose business practices face the biggest challenges. From a business point of view, compared to plastic packaging will lose out there is huge potential: the production of eco-friendly packaging in an area that has to be filled as quickly as possible.

The problem is not plastic itself, but not a bad thing as long as it is properly managed. Our planet struggles with disposing so substituting plastic single-use items with other single-use items is only a patch to the waste catastrophe. We should change our habits and use our own coffee bottles, reusable bags and food containers on a daily basis. Organic single-use items are the final choice.



the inevitable end of the golden age of plastic is something that concerns all of us. Design and architecture professionals face a huge challenge: how to employ eco-friendlier materials while also reducing waste production to a minimum at all stages of the design process?



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"Pla-Kappa: *A Cautionary Tale of Accumulation*" by Tei Carpenter, Arianna Deane and Ashely Kuo (Agency-Agency), winner of the "LA+ Imagination" ideas competition to design a new island, organised by LA+ *Interdisciplinary Journal of Landscape Architecture*. The project by the New York studio imagines life on the island of Pla-Kappa, consisting in 150,000 km<sup>2</sup> of organic matter and accumulated human-made waste in the ocean currents of the North Pacific. Its surface has become home to an extreme ecosystem with endemic species that have adapted to their new habitat such as mutant caddisfly larvae (which use waste particles as protective cases), mealworms that feed on Styrofoam and plastic-eating bacteria.

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The creative industry is also facing a challenge.



# cts join forces rticulturists, pe designers, sts and climate ers to cultivate rban nature

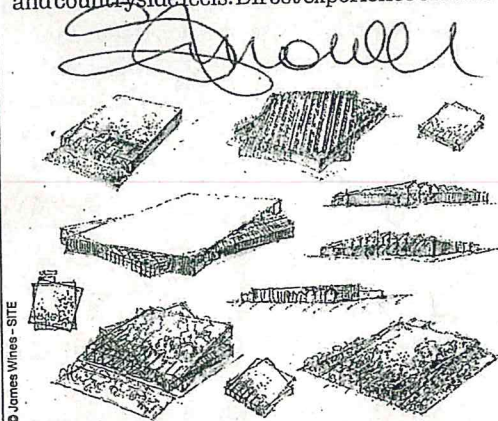
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One well-known solution is the "vertical forest",  
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## Can buildings be growth-friendly?

Different epochs have placed different de-  
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# the future of urban mobility most likely result in a mixture of continuity and change. What, in transport terms, is going to change and what is most likely to stay?

Mobility is an essential feature of our cities. It mirrors our lifestyle and it is simultaneously cause and effect of urban life.

Although technology has enhanced what we can achieve without leaving our homes, we move and have things moved possibly more than ever before. Furthermore, our mobility needs have collective consequences: pollution, congestion and noise.

With the automotive industry on the cusp of a technological revolution, it may well be that the mobility systems of the future will be different from what is in place in most of the world today. At the same time, however, it is safe to assume that some fundamentals will not change.

The need to cut emissions and use energy resources efficiently, for example, is leading us towards vehicle electrification.

The possibility of reducing the number of accidents, meanwhile, is inspiring the development of autonomous driving solutions. The first self-driving vehicles expected on the market by the mid-2020s will have twofold consequences. On one hand, they may well encourage even more

dispersed residential patterns, while on the other, driverless buses and trains will allow transit agencies to optimise their services, because a significant component of their cost structure is tied up in human labour.

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These new ways of moving are as enablers of change. But they also pose a whole array of new challenges. Technical, logistical, social and regulatory issues lie at the core of mobility trajectories in different cities.

We looked at four cases in North America and Europe. In Los Angeles, though cars are the dominant mode of transport, since the 1990s the city has invested in a complex multimodal system that encompasses light rail and is serving more and more of the city. In addition to the 6 lines of the Metro Rail system, the Metro Rapid system with its 7 routes is proving increasingly popular.

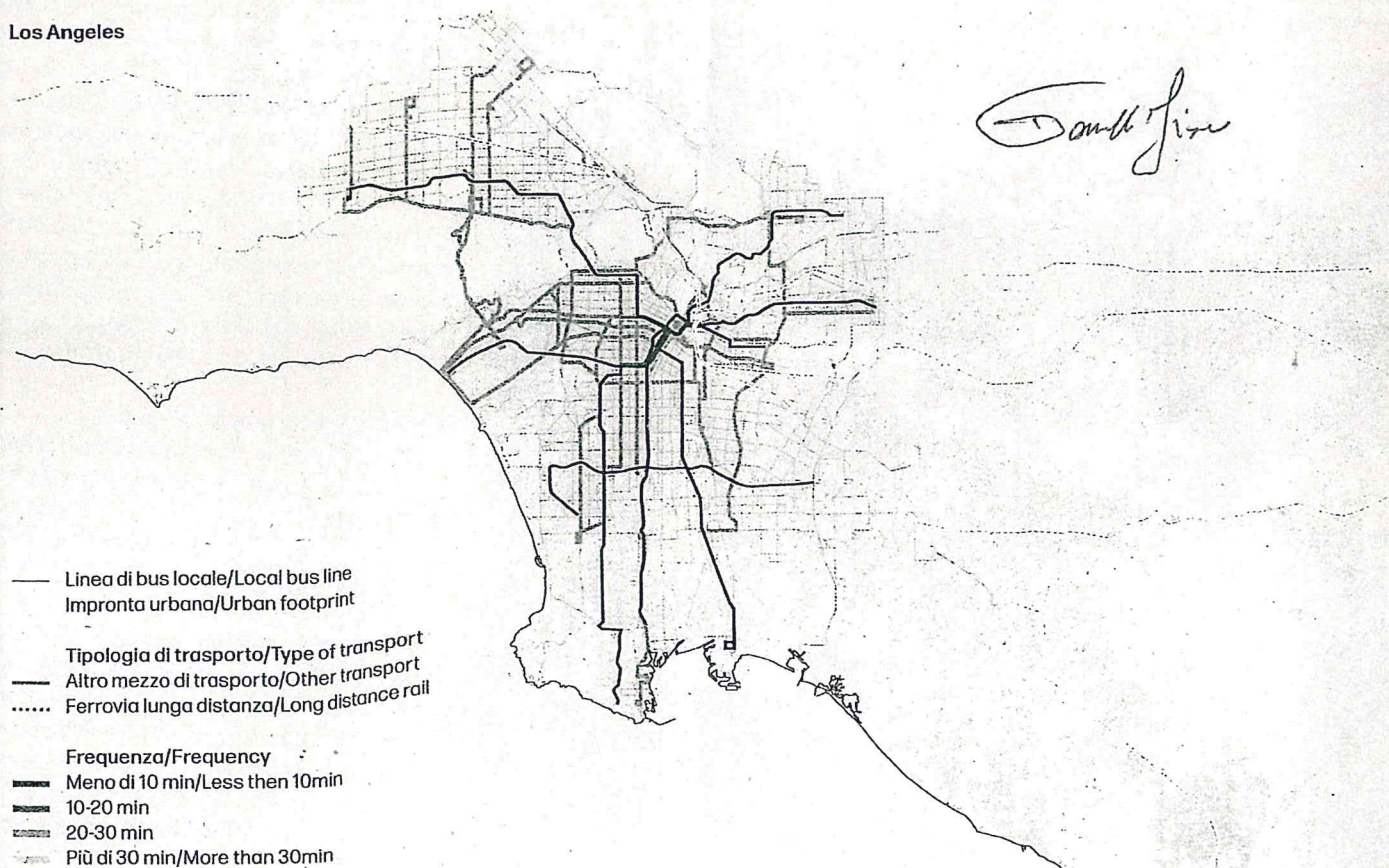
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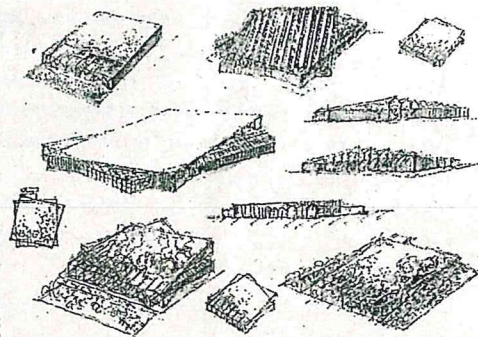
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© James Wines - SITE



– regardless of the floor one lives on – came together with an opportunity to connect with one's neighbours. As for the project by Fargas and Tous, it is nothing less than Barcelona's (and, apparently, Europe's) first vertical garden. Each of the building's nine floors is hooped by a double belt of planters with a combined length of 3.8 km. Biologists Jordi Aguilà and Xavier Martínez have developed a pioneering hydroponic system to feed this hanging garden, while Everest Munné selected the species for a natural-looking green enclosure where different plants would keep it alive at different times of the year. In a recent, particularly poetic example of urbanature, architect Takashi Fujino (Ikimono) placed his home, office and garden under a transparent eight metre-high roof. The concrete structure with large glazed openings provides "just the right amount of physical comfort, but is extremely generous in the way it engages all of the senses," Fujino says. In spite of its modest size, the project points to many aspects of urbanature.

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## Can buildings be growth-friendly?

Different epochs have placed different demands on architecture. In a world where two-thirds of the population will soon be living in cities, the demand is to provide conditions for accommodating life – not just for people, but "for living beings in general," believes Frédéric Chartier, principal at Chartier Dalix architects.

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at the beginning of September, representatives of 150 fashion brands signed the "Fashion Pact" by which they committed to the impact of their work, for example by reducing plastic. The pact includes Prada, Gucci, Chanel, Nike, H&M and Zara. The "Fashion Pact" was commissioned by French President Emmanuel Macron and developed by François Pinault, the chairman of Kering (the largest fashion concerns).

It was presented and signed during the last G7 summit in Biarritz. "The global challenges we are facing are complex. They know no borders. Only coalitions can overcome them, bringing together Governments, businesses and civil societies" tweeted Pinault. Industries are undertaking similar action all over the world.

Ecology is a huge problem for architecture and construction with as much as 26% of the plastic produced being used by these industries, mainly as foamed polystyrene. It is the second most "plastic" sector after the packaging industry. Pro-eco solutions should be introduced at the design stage. Green architecture does not only mean a focus on the materials used to construct a building but also on the natural context and the ergonomics of the design.

The carbon footprint left by using the building

should be as small as possible - and can be lowered by employing solar batteries to generate electricity and heat.

At the project implementation stage, the minimisation of waste production is just as important as the use of eco-friendly materials. Appropriate work planning allows savings of the Earth's resources and money. Waste generated in the construction process should also be taken care of and (if possible) sent for recycling or other uses.

**Let's work together to change the world**

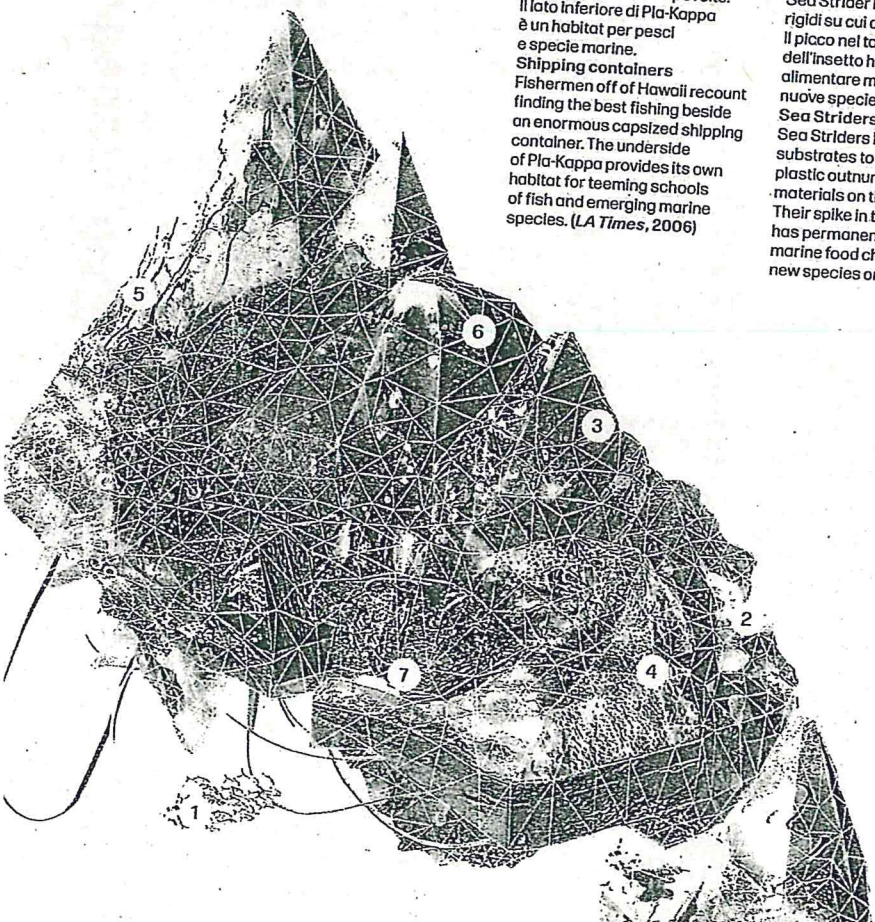
The inevitable end of the golden era of plastic is a fact and all the creative industries worldwide have to accept this. Scientists are not only looking for new materials but also for organisms that can boost the biodegradation of already produced plastic.

Scientists are researching new materials and organisms that can help with the biodegradation of produced plastic. A bacterium capable of breaking down and consuming plastic was discovered in Japan in 2016. It broke down a partially decomposed bottle in a few weeks. They have also discovered enzymes allowing decomposition of PET. Perhaps, they will be used to develop microbiological formulas that will support us in the fight with used packaging. The vision of an eco-disaster is becoming

increasingly affects nature. One of the main generators of post-apocalyptic no drink. However, by taking legal and administrative resolutions, it is still not clear. We can find ways: by involving corporations as (including excessive) also urgent and work may vary towards an

**Marcin Szczygiel** and founder of *Snob*. He curates a Civilization Copernicus. He and Hugo about garbage Architecture

**PLA-KAPPA: UN CATTIVO ESEMPIO DI ACCUMULAZIONE/ PLA-KAPPA: A CAUTIONARY TALE OF ACCUMULATION**



**1 Container**  
I pescatori delle Hawaii sostengono che la zona più pescosa si trovi intorno a un enorme container capovolto. Il lato inferiore di Pla-Kappa è un habitat per pesci e specie marine.  
**Shipping containers**  
Fishermen off of Hawaii recount finding the best fishing beside an enormous capsized shipping container. The underside of Pla-Kappa provides its own habitat for teeming schools of fish and emerging marine species. (LA Times, 2006)

**2 Sea Strider**  
Dato che la plastica supera di gran lunga i materiali organici sulla superficie dell'oceano, i Sea Strider hanno più substrati rigidi su cui deporre le uova. Il piccolo nel tasso di crescita dell'insetto ha alterato la catena alimentare marina, producendo nuove specie su Pla-Kappa.  
**Sea Striders**  
Sea Striders have more hard substrates to lay eggs on as plastic outnumbers organic materials on the ocean surface. Their spike in the breeding rates has permanently altered the marine food chain, producing new species on Pla-Kappa.

**3 Tricottero**  
Nel 2070 su Pla-Kappa una versione mutata di tricottero che usa seta con frammenti per creare involucri e secerne un enzima per produrre nuovo Caddisfly.  
In 2070 a mutation of larvae burgeoned on using its silk to form cases out of loose particles, secreting an enzyme to produce r

**4 Papere di gomma**  
Nel 1992, durante una tempesta, un container di papere di gomma è crollato in mare sulla rotta dagli Stati Uniti. Ci sono tre anni perché le papere completassero l'intercambio delle correnti del Pacifico settentrionale, per intanto alla fine nel perimetro di Pla-Kappa.  
**Rubber ducks**  
A container with 29,000 rubber ducks fell overboard from Hong Kong to the States during a large storm in 1992. It took three years for ducks to circulate the entire Pacific Gyre, eventually into Pla-Kappa's outer fringes. (The Guardian, 2011)

**5 Scarpe da ginnastica**  
Nel 1990, durante una tempesta, 80.000 paia di scarpe Nike sono cadute in mare da un portacontainer al largo delle coste della Corea. Le scarpe hanno vagabondato per gli oceani per oltre 10 anni fino a formare una parte sostanziale di Pla-Kappa.  
**Nike sneakers**  
In 1990, 80,000 pairs of Nike sneakers fell from a cargo ship off the coast of Korea. The shoes drifted across the oceans for over 10 years until they formed a significant part of Pla-Kappa.

*Handwritten signature or initials.*



## The exponential increase in the production of palm oil is causing grave damage to the environment and rural communities in areas of cultivation

*Handwritten signature*

In the photo on the opening pages, *Clearcut #1*, amorphous crop circles hint at an alien power, as they consume a verdant forest. The landscape is a scene of opposition – artifice and nature, the virginal and the ravished – yet the antagonists in this conflict are faceless. The photograph reeks of human touch, without evidence of who wreaks it.

Plantation agriculture is ecological violence. Globally, oil palm plantations have razed 27 million hectares of forest, an area the size of New Zealand.<sup>1</sup> Given the crop's equatorial growth zone, these monoculture plantations replace some of earth's most biodiverse rainforests. In Indonesia, the world's main producer, fires lit to clear forest for planting triple the country's net carbon emissions. Annually, they drape a toxic smog over Southeast Asia, killing 100,000 people in 2015.<sup>2</sup>

Palm oil's rise is staggering: a 23-fold production increase from 1970 to 2010,<sup>3</sup> now set to repeat in just a decade. As the cheapest fat to produce, palm oil is put in most processed foods. Refined into oleochemicals, it gives soaps and detergents their lather. In the 2000s, the US and EU created a massive new market for the crop by increasing the share of biofuel added to gasoline. Recognising

globally, the market for palm oil is booming.

A consumer in Singapore does not know the chocolate bar in her hand is the reason she has to remove her face mask to eat it.

Oil palm can be four times more productive than other oil crops, but achieving this requires a precise supply chain. Seeds, cross-bred in laboratories to create the high-yielding *tenera* variety, are germinated in controlled conditions before the sturdiest seedlings can be planted. It will take three to five more years of investment before the trees yield fruit. A plantation worker harvests several hundred 10- to 40-kilogram fruit bunches a day, which are then trucked to a nearby mill. The fruit must be milled within 24 hours to avoid growing acidic. From here, oil goes to a refinery for processing before being shipped off to the factory.

The 24-hour limit for bringing fruit to mill is materially inscribed on the landscape, in paved roads and industrial sites. So too is the meticulous regime for forest management, with trees spaced to optimise yields, and simplify fertiliser and pesticide application. Enormous patchwork grids of palm across Sumatra, Borneo and the Malay Peninsula can be seen from space.

Critical geographers use the term "planetary urbanisation" to describe the ways corporate production and extraction subsume territories far beyond city limits.<sup>4</sup> Cities may appear as isolated dots on a map, yet their continued growth demands ever-larger zones of support. In Indonesia's Riau Province, 28 per cent of the total land cover – half, in some sub-districts like Rokan Hulu – bears the texture of palm cultivation.

*Clearcut #1* captures this process of urbanisation, but its aerial perspective cannot tell the full story. Outside the frame are the labour camps, empty villages and plantation offices. Confronted

A sinistra: pedoni nella Marina Bay di Singapore sullo sfondo del quartiere centrale degli affari avvolti dallo smog causato dagli incendi boschivi indonesiani, appiccati per incrementare le piantagioni di palme da olio, settembre 2015. Pagina a fronte. In alto: gli effetti dell'incendio di una foresta a Bukit Tigapuluh, Sumatra, Indonesia, provocato dai produttori di olio di palma. In basso: raccoglitori dei frutti di palma nella piantagione del villaggio Kuwala, distretto di Kutalimbaru, Deli Serdang, Sumatra Settentrionale, Indonesia, gennaio 2017

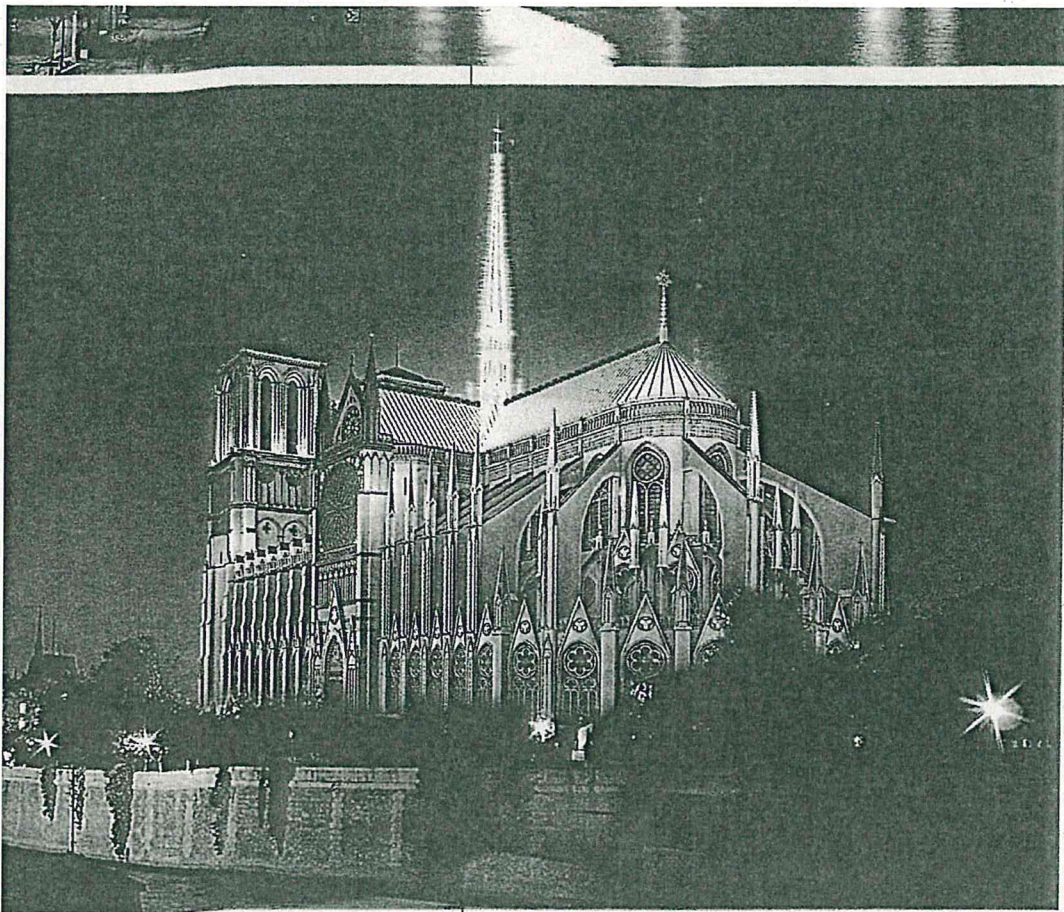
Left: shrim in the Marina Bay of Singapore with the central business district in the background, September 2015. Page opposite. Top: the effects of a forest fire in Bukit Tigapuluh, Sumatra, Indonesia, caused by oil palm producers. Bottom: palm fruit harvesters in the village of Kuwala, Kutalimbaru district, Deli Serdang, North Sumatra, Indonesia, January 2017

precarity of a new labour regime. We must interrogate the destruction, and descend in view to indict ourselves.

Oil palm plantations are: labourer works six to eight blocks sit isolated. Older village cropland, are mostly empty. labourers brought in from afar or kinship ties and are less a better working conditions. A estates employ an estimated 600 workers, mostly Indonesian day, they carry out the back-breaking labour of spraying toxic chemicals on fruit bunches; their job tenuous, releasing employers of the for workers' rights or benefit conditions is to court death. It leads oil palm's expansion in land rights activist Hernán. I palm oil companies and was activists brutally killed in 2010.

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ano e/and Doriana Fuksas

1  
già il giorno  
cendio, la  
nagina la  
del tetto in  
carat

First discussed in an  
interview the day after  
the fire, this proposal  
imagines the roof rebuilt  
in Baccarat crystal

## ate the past or think future? The fire of risian Cathedral has ed an online debate

16  
The histories of Notre-Dame de Paris are  
ree periods will stand out as critical  
the cathedral's story.  
is its construction, a period that  
2 years from 1163 to 1345. The second  
n with the cathedral's rehabilitation  
ic imagination, initiated by Victor  
1 novel that took the building as its  
and ended 33 years later in 1864 with  
tion of Eugène Emmanuel Viollet-le-  
ration project.  
period is our current one, beginning

with the fire on 15 April 2019 that destroyed the  
building's roof and Viollet-le-Duc-designed *flèche*  
and ending – if we believe the promises of French  
president Emmanuel Macron – in five years' time,  
before the opening of the 2024 Paris Olympics. It  
is often said that buildings which have survived  
dramatic and threatening events both contain  
and display their history in their physical struc-  
ture. But in its evolution through these three  
periods, the structure of Notre-Dame is a time  
capsule cataloguing not only its own story, but  
also the story of an ever-changing world. J

### "This Will Kill That"

When the cathedral was built, it was done so  
largely without debate: the decision to construct  
a new building was made by the Church, and de-  
cisions about design were made by high-ranking  
members of the Church and the master builders  
they appointed. But by the 19th century public

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Un tetto gonfiabile,  
concepito come  
intervento temporaneo,  
suggerisce di  
guadagnare tempo per  
discutere un'adeguata  
soluzione definitiva

This infla  
intended  
intervent  
as a way  
time to di  
appropri  
solution

debate, enabled by printed media,  
the decision to restore Notre-Dam  
novel stirred the public imagina  
lysed calls for something to be don  
ironic twist, given that Hugo's nov  
entire chapter expounding the th  
book will kill the building" as a co  
medium). Printed media also he  
the details of the restoration, w  
Duc engaging in vigorous public  
Quatremère de Quincy, alongside  
jections from figures such as John  
21st century, many might be surp  
that these debates, conducted th  
articles and books, never really end  
of Viollet-le-Duc's work at Notre-D  
not only beyond the completion o  
beyond Viollet-le-Duc's death in  
into the 20th century.

A different kind of media, intern

*John L.*



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*Opinion*

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