The Floor Is Not the Ground: Ecologies of Interruptions in Transportation Infrastructure

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Introduction

Harbours, airports, train and underground stations, as well as interchange yards, hubs, and warehouses are all understood within the broad framework of logistics. Moving people and goods is considered an interconnected theme of great importance in the twenty-first century, since the relentless technological innovation in the fields of communication and transportation has fostered global exchanges and competition.[1] Despite their apparent similarities, mobility of people and supply of goods are two separate types of circulation, for the nature of the object to be moved differs: living beings or lifeless objects. Yet, despite this gap, and due to their generic grouping as logistics, transportation infrastructures have largely been led astray by the remarkable developments of the fulfilment supply chain. Strategies and formations originally established to ensure the integrity of product and capital flows are expanding beyond their original field and scale, to structure the back end of human mobility spaces, imposing narratives of efficiency, security and restlessness, eventually treating people like packages in circulation.

Although these logistical strategies are in line with the dominant understanding of infrastructures as mere functional assemblages, ports, airports, train stations, and bus terminals are doing more than just supporting movement and circulation; they are essential public works with direct reference to their everyday users.[2] If we think of everything that is public anyway, spaces of circulation constitute a significant part of it. Unlike other public works like dams, water pipelines or internet cables, transportation infrastructures are unavoidably and by definition open to the public, thus bringing the potential of being active public spaces, in the way James Corner understands them: 'public space in the city must surely be more than mere token compensation or vessels for this generic activity called "recreation"'.[3]

Nevertheless, considering the primacy of the fulfilment supply chain tactics, it is an architecture of logistics that seems to be structuring this major division of public space. This essay is an effort to challenge the contemporary 'fulfilment'-influenced, network-based perception of human transportation spaces, towards, instead, a relational – and effectively political – understanding. This is not only to suggest the re-emergence of localities and traditional notions of place in defence of identity, something that has previously been extensively debated, but mainly to seek possible strategies to interrupt this detrimental, endlessly intensified circulation imposed on public space, and to allow more humane, place-specific spaces to emerge. In the words of Alberto Toscano, the question of what use can be drawn from such disruptions 'in a world no longer dominated by value, proves to be a much more radical question, and a much more determinate negation than that of how to render the metropolis, and thus in the end ourselves, useless'.[4]

I argue that this project is an effort to break free from the universal floor of production and distribution, moving on to embrace the more uneven specific grounds of friction and aberration. The argument is structured on the potential recalibration and rebalancing of these two conflicting sets of forces, conceptually represented throughout the essay by the notions of floor and ground respectively. Contemplation on this pair of terms was triggered by the observation of a recurring confusion between the two in the literature.

The floor: the key ingredient to logistics cooking

The metropolitan agglomerations we inhabit today have their history rooted in circulation concerns. Lewis Mumford identifies the supply chain as one of the indispensable support mechanisms of the contemporary city. The unlimited accumulation of populations at specific locations made it crucial 'to widen the basis of supplies and to protect the "life-line" that connects the source to the voracious mouth of the metropolis'.[5] Indeed, at the founding moments of 'urbanisation', Ildefonso Cerdá produced his theoretical treatise *Teoria de la viabilidad urbana* (theory of urban viability), inventing a neologism to emphasise his concerns for the via, the road.[6] His theory points out the continuity of movement as the first law of *vialidad*, triggering extended studies on the network of ways, the layout of the streets and the nodes of intersections. The well-known chamfer of the Barcelona building blocks emerges as the optimised version for transport and logistics services, largely determined by relevant turning angles of the era.[7] Reducing the city to the urbs, maintaining only the necessary components that support the circulation of capital, was one of the steps towards the problem of the metropolis as Massimo Cacciari put it: 'the Metropolis is the general form assumed by the process of rationalisation of social relations … which follows that of the rationalisation of the relations of production'.[8] Identifying evidence of this development in the contemporary urban experience shaped by logistics is not a difficult task. Internally, workspaces of logistics are increasingly calibrating workers' bodies 'with the needs of an automated system of stuff' in a 'more-than-human' environment.[9] Entire territories covered by dedicated gateways are emerging, sometimes even calling themselves 'cities'. Logistics cities promote bare-labour ways of life and are often comparable to concentration camps.[10] External to these spaces of exception, despite the logistics promises of shrinking distances, consumers seem to be more distant from the producer and the production process than ever. Jesse LeCavalier observes the archiving of consumer wills in warehouses: the 'configuration of the inventory is a dynamic index of consumer desire mediated through the bar code'; human desires have come to be reflected only through impersonal warehouse directories.[11]

Such transformations of social relations are well explained by the emergence of what Manuel Castells labels the space of flows; 'the dominant spatial manifestation of power and function in our societies'.[12] The space of flows emerges as a highly relevant conceptualisation of contemporary social-spatial theory in which the territories of logistics are of utmost importance, serving as its material support. 'Our society is constructed around flows: flows of capital, flows of information, flows of organisational interaction … Flows are not just one element of social organisation: they are the expression of processes dominating our economic, political and symbolic life.'[13] Castells goes on to describe the layers that structure the space of flows. First come the exchange circuits, the spokes and network branches that sweep across space; they ensure connection lines for the flows to travel. Then follow the points to be connected, nodes and hubs to serve as departure, distribution or arrival terminals of the traveling flows. The space of flows emerges like an abstract but powerful mesh, capable of

assigning roles and determining relations and hierarchies among points in space, yet floating above them establishing no associations whatsoever.

Faithful to the space of flows and its structure, logistics organises physical territories in conduits and nodes, also applying a smoothening layer in both these levels of organisation, a layer that makes fields easily navigable and efficiently controlled; it is a kind of 'floor', working across scales and declaring universal ease of access. Traversing its literal and metaphoric meanings, the floor becomes the basic tool to tame and eventually overcome physical geographic abnormalities, to homogenise context and prepare a smooth surface for the frictionless circulation of commodities. The floor becomes the stage for the everyday logistical choreographies of infinite complexity, dances prepared beforehand in detail by a 'regime of total awareness and control'.[14]

Looking at the nodes and hubs scattered around logistics networks, the floor becomes apparent within its strictly literal framework. Logistics facilities occupy vast lands to house their operations; essentially in need of horizontal surface to stack stuff, warehouses and distribution centres produce impressive footprints. Additionally, considering their exterior premises, including parking lots, receiving zones and staging areas, Clare Lyster aptly notes that it might be better to talk of a 'logistics landscape'.[15] Scattered throughout its body, the floor carries instructions for use; arrows, separating lines, stop signs, inscriptions, numbers, and other graphic patterns that communicate its operating protocol. Although low-tech, this kind of horizontal readability must have inspired its later upgrade to become an information carrier, or in Keller Easterling's words 'the brains of an intelligent navigation system'.[16] The floor may incorporate hardware, from tiny mechanical roller balls assisting container hauling, to RFID and GPS tags guiding automated robot vehicles. The dominance of the floor renders the rest of the architectural elements unimportant. If not completely absent, like in container parks, the envelope is reduced to its minimum infrastructural necessities, be that protection from the weather, or housing lighting, ventilation and air-conditioning. Instead of walls or other surfaces, verticality is rehearsed by vehicles already inhabiting the logistics floors, capable of moving not only two-dimensionally, but also in the z-axis. Conveyance systems of this kind shape a whole new structure and suggest new environments.[17]

The floor is indeed the most important physical element of logistics space, but we feel it is helpful to further our understanding of the floor towards a more metaphorical deployment. Zooming out, we see logistics entities leading a life of their own. Their floors, seemingly installed in the middle of nowhere, operate as the projection of the air-floating mesh of the space of flows. Regardless of their surroundings, the only thing that matters is the potential link to the rest of the network. Castells stresses this placeless logic of the space of flows and Lyster goes on to proclaim the network as the 'new context'.[18] This intrinsic incompatibility with physically contiguous environments is essentially another mechanism of friction removal. Applying its figurative meaning, logistics floors defy any language they don't understand: human, environmental, cultural, historic and so on.

Adjusting our lens and looking at spokes and conduits, smoothing has a long history. The first public floors were roads used to facilitate trade and army manoeuvres. Evolving from navigating through pre-existing fields, civilisations started creating manufactured strata. Maxwell Lay notes that the concept of artificial road pavements was introduced by the Minoans in around 2000 BC and after that by the Carthaginians, as an alternative to the earlier technique of simply improving the existing ground. This effort to establish circulation channels from

scratch is also evident in King Nebuchadnezzar's statement after conquering Lebanon around 600 BC: 'I have cut through steep mountains, I have split rocks, I have made a way through and built straight roads for [exporting] the cedars'. The Romans later built on this heritage and improved existing techniques to create their extensive network of roads, bridges and tunnels for which their empire is famed. Their circulation floors were not surpassed until the railroads made their appearance throughout the American landscape in the mid-nineteenth century.[19] Circulation has since begun to require more global narratives, linking spatially and culturally distant regions. Easterling argues that 'universal stories have … accompanied aspirations for shared, rationalised infrastructure platforms'. The shipping container came to be an example of such universal implementation, indistinguishably tidying different goods up in twenty-foot-equivalent boxes.[20] Service quality combined with security proclaims the necessity for a stable underlying structure to carry out circulation. Like other floors, contemporary logistics corridors are the most representative instances of this tendency. Reminiscent of the amber road network formed around 1500 BC, dedicated freight corridors in India and international recommended transit corridors in the Gulf of Aden are planned to facilitate and secure the transportation of goods, particularly in precarious areas.[21] Laying floors to level out unevenness emerges as the most relevant strategy of logistics; the floor as an apparatus of space organisation emerges as the essential element of architecture and strategy in logistics landscapes.

The floor expanded: influences in transportation infrastructure

Yet the floor is not limited to the enclaves of logistics; it escapes the closed systems of warehouses, distriparks and logistics corridors, to structure human environments too: harbours, stations, terminals, streets and cities. It carries along its technological accessories and contagious narratives of seamless circulation, all mixed up with network obsessions. Hence, influences of logistics space on transportation infrastructures is more or less evident in both its hardware and software. I will try to illustrate with examples of the technological apparatus, the structure of space and its overall placement.

People standing on travelators in airports bring to mind the image of suitcases circling around the baggage reclaimers a level below; although the conveyor belt was initially invented for the production space of the factory, it is no less a machine for circulation. Shuttles carrying people on board from the terminal and other driverless rapid transit conveyances follow the model of automated vehicles to be found around logistics warehouses and parks. Easterling investigates companies like FROG, which besides producing sophisticated automated guided vehicles to handle containers, are also entering the market of civilian transportation.[22] In the realm of personal automobiles, automated vehicles imitating experimental logistics projects like the Transcar have appeared in photorealistic visualisations of fellow practitioners moving both horizontally and vertically through their projects.[23]

Furthermore, the patterns of transport infrastructures have been infiltrated by logistics-influenced repeatable formulas; best practices suggest seamless assemblages throughout the world, for circulation speaks a universal language. Most airport terminals fit within a limited typology of five instances, while passenger ports feature seamless truck parking rows and specific fence sequences to comply with the international ship and port facility security codes.[24] At the same time, the structure of transportation spaces is dominated by functional diagrams and flow charts. Terminals of any kind guide crowds to check-in, shop, and board as smoothly as possible. Following the logistical art of space optimisation, designers seek the minimum

walking distance arrangements, while airlines propose a number of ways to arrange more people in cabins: from Airbus's bicycle saddle-like rows to Aviointeriors's standing-up seats and Zodiac Seats' hexagonal seats facing alternately forward and backward, we are reminded of the tight arrangements of twenty-foot equivalent units and pallets on ships and trucks.

Transportation spokes and hubs are mostly arranged according to the hierarchies of the space of flows, imitating the abovementioned logistical strategies and ignoring both the physical context, and its place-specific cultural attributes. Train and highway conduits link points on the map, almost ignoring people and places in between and around them. Highway flyovers in dense megacities like Mumbai shrink distances by literally stepping on and covering the existing urban fabric. Looking at nodes, passenger ports in places like Venice or Stockholm follow the airport model and leave the city waterfront to explore virgin frictionless places along container and bulk ports. Ryanair airport choices land people in the middle of nowhere, while metro stations sometimes emerge in the periphery of the area that they are named after.

After all, it's impossible to tell that figure 1 depicts a port, let alone the contemporary passenger port of what was once the largest maritime empire. [Fig. 1] Having travelled almost twenty kilometres out of the island of Venice, passengers arriving at Fusina port pass through a security check and are then asked to navigate through parking lots full of identical rent-a-cars or colourful container-like stacked parked trucks, following a marked path on the floor. All that seems to matter is to get to their ship as quickly as possible, to escape this emptiness of space and time. Exactly like the optimisation of an item's time spent in stock, passengers get to the harbour just in time, they board the ship just in time; only just-in-time geographies is what they get. Public spaces of transportation infrastructure are structured as the mere vessel to facilitate and guide flows. To quote Rem Koolhaas, 'as more and more architecture is unmasked as the mere organisation of flow …, it is evident that circulation is what makes or breaks public architecture.'[25]

This expansion of the logic of the floor means certain qualities and features of the fulfilment supply chain related to technology, quality, security, standards and space structure are bequeathed to transportation infrastructure. Developed in the context of lifeless entities and aiming for their optimal circulation, such features may suit the spaces of logistics, but are problematic when expanded to the realms of architecture and urban planning. People are treated like mobile packages rushing from A to B on a networked, yet frictionless surface, as if transportation is based solely on the space of flows, serving only the circulation of capital and information. Although it is true that passengers' demands for circulation and interconnectedness shape and justify the transportation network, the interrelations of humans with space and context cannot be overlooked. For transportation infrastructures are primarily dedicated to serving living beings, and are placed in a specific urban context, among people who unavoidably develop experiences and memories, even without using these infrastructures for their primary purpose. Hence transport infrastructures stand in a peculiar position between the space of flows and – its competitor according to Castells – the space of places: different from a mere instrument of flows, like a container port, but more than just a place-specific locale, like a neighbourhood square, harbours and train stations are something in between. I would posit that logistical tactics disregard this peculiar placement of transportation infrastructures between flows and places, shaping the public domain of transition by imposing two interrelated structural changes in space.

To understand both these changes, we first need to acknowledge the foundation of circulation upon relative space. David Harvey's tripartite division of space is relevant here, which breaks it down in three distinct categories: absolute, relative and relational.[26] 'Absolute' stands for the fixed pre-existing space responding to standard measures, while the 'relative' notion distorts the former according to different frames of observation; for example, looking at length, cost, or travel duration results in different understandings of distances between two locations. The space of flows, dictates hierarchies and priorities, and is therefore a strictly relative conceptualisation of space: the movement of goods and people happens in the relative space, dependent on issues of location, distance and proximity.

Such a formulation of space is highly compatible with soulless objects like container boxes, crates, packages, and envelopes, but this is arguably not the case with places and humans. A person inevitably perceives Harvey's third category, relational space, forming experiences, internalising and translating external stimuli. This break between a relative and relational understanding of space, representing the break between flows and places, brings us to the first structural change of transportation infrastructures: the network leaves no space for human stimuli to make sense; on the contrary, a certain logistical tendency to overprotect and securitise its operation becomes evident. When people without access to a car literally ran for their lives evacuating New Orleans on Interstate 10, during hurricanes Rita and Katrina, they were stopped at gunpoint, because freeways are for cars, not for pedestrians.[27] Deborah Cowen observes that 'the circulatory system itself becomes the object of vulnerability and protection, not human life in any immediate way'. Logistics circulation systems are treated as 'vital systems' to be preserved and safeguarded, considering human living conditions subordinate, and thus, 'making sense of logistics … requires an elaboration of the "more-than-human" politics of nature.'[28] Users of space are not people with a past and an identity, they do not have memories and fantasies, they are only represented by their ticket-, passport-, car number plate-, or ID number. They are reduced to 'no more than what [they do] or experience in the role of a passenger, customer or Sunday driver'.[29]

In the relative spatio-temporal understanding of transportation spaces, where frames of observation result in different perceptions, the time frames of flows and places clash. In the space of flows, Castells elaborates the concept of timeless time as the result of the compression of the occurrence of phenomena, while in the space of places he acknowledges the existence of distinct socially bound temporalities.[30] The balance between these two spatio-temporal frameworks 'can', in Harvey's words, 'illuminate problems of political choice': favouring the slowest timeframe of places may disrupt the restlessness of people's flows.[31] This takes us to the second change: contemporary transportation spaces seem to favour timeless time, organising open spaces and buildings accordingly. Influenced by their logistics counterparts, transportation public and semi-public spaces are mostly byproducts of the space of flows. In these domains, people run after the clock, indifferently crossing spaces between their points of interest; travel is reduced to transitions.

These two changes in transportation infrastructures are rooted in the very idea of smoothness; they are caused by the domination of the floor. The latter, I argue, could represent a literal reading of Jacques Rancière's concept of the police, as it 'asserts that the space of circulating is nothing other than the space of circulation'.[32] Passengers can have no other will than to move from one point to another. Subjects that deviate from the primary transportation purpose are unwanted and expelled.

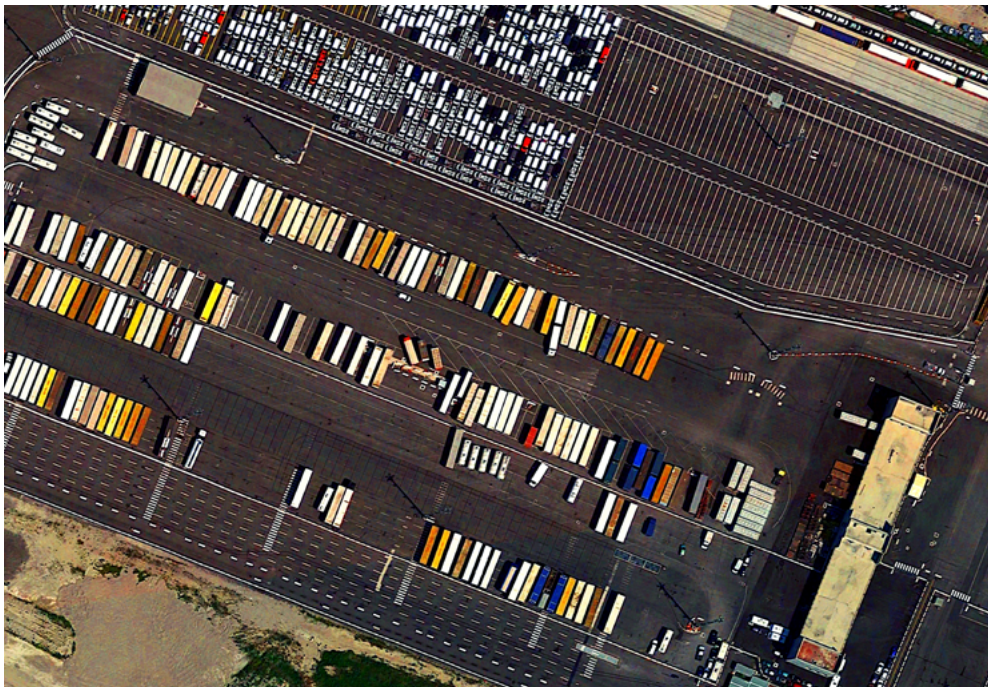

Fig. 1

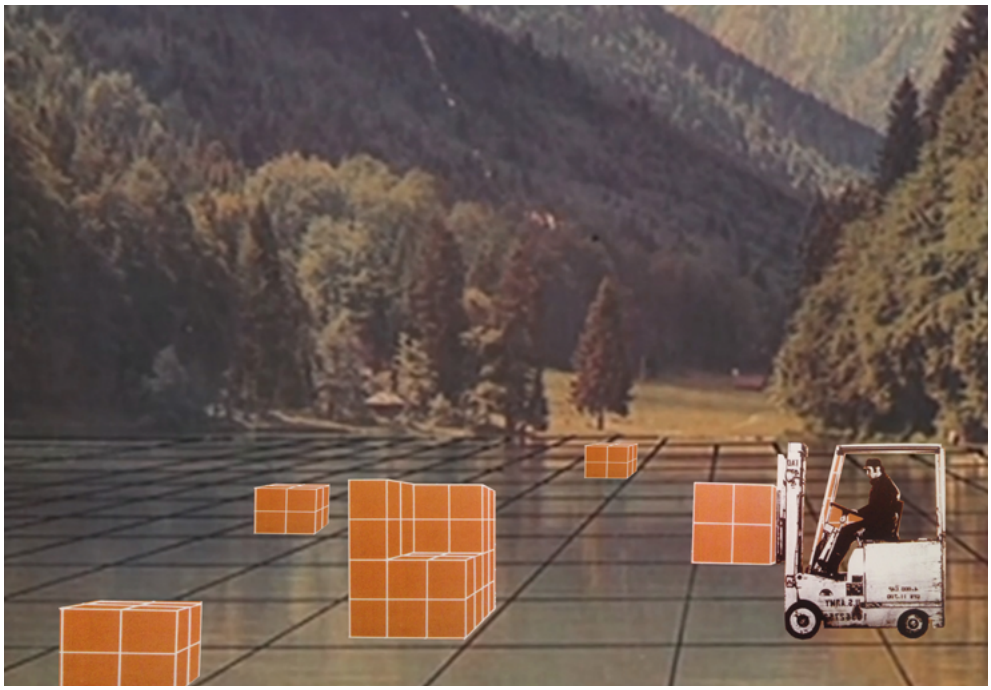

Fig. 2

Fig. 1: Fusina passenger port. A space reserved for humans, designed for objects. Source: 'Fusina, Venice, Metropolitan City of Venice, Italy'. 45º25'33''N and 12º15'10''E. Google Earth. 29 May 2017.

Fig. 2: Superfloor. A collage of a US army logistician moving stock around the Supersurface, an infinite smooth area supposedly receptive of every kind of life activity. Digital collage: Jenny Lazari and the author.

This friction neutralisation implies an absolutist regime of compulsory consensus, which in turn leaves no chance for the appearance of the subject, reducing human movement to algorithmic roaming between points of departure and arrival. In a port like Fusina, a person has no other option than to follow the security protocols, check their ticket and passport, and then move from the terminal to the boat. Spanning pedestrians, cyclists, drivers, truckers, car rental workers, and every other possible user, there is a predetermined sequence of steps to navigate the space. Moreover, space is calibrated to fit this sequence only; any effort to stage alternative activities, from a cultural event to a demonstration, is usually rendered incompatible and unacceptable. In the most introverted and distant part of the port of Piraeus in Athens, the port authority, practically managed by the COSCO shipping company after recent privatisations, did not allow a memorial concert to take place on the port premises. Although permission was requested by the municipality of the neighbouring suburb Drapetsona, the port authority cited security risks, lack of space and incompatibility of programmes.[33] Once the floor, with its attributes and protocols, is determined, it demands to be followed, invoking a certain functionality. Welcoming only subjects who 'move along', the floor is monofunctional, overspecified and highly exclusive.

Floor versus ground: a misunderstanding

In an effort to rethink the floor in a less specified and more inclusive way, one is reminded of Superstudio's concept of the Supersurface, a neutral infrastructural mesh that wouldn't impose fixed settings or protocols of use, thus being compatible with nomads, girls with skipping ropes, domestic environments including ironing boards, and cactuses.[34] To achieve this, the Supersurface flattened an infinite field, imposing a seamless grid to accommodate everyone equally. Likewise, the US army's magazine *Army Logistician* features an image of an orange grid covering everything around a forklift worker, displaying similar flattening tendencies.[35] [Fig. 2] The floor's smoothness could allegedly be employed to welcome different subjects and activities. However, any effort to rethink the concept of the floor would be confined by its existing limitations, rules and understandings – just like in Superstudio's video, the Supersurface only plays upon the available flat fields, unable to climb mountains, hills and glaciers. An inclusive floor would just be a realignment of the existing rather than something inherently new; it would be a modification rather than a substitution.

Instead of resisting the floor on its own terms, what we are looking for is a different language. Such a language that is compatible with the openness and the acceptability of some 'supersurface', but also embraces cliffs, mountains, and other uneven fields, can be found in the notion of the ground. It is arguably only subtly differentiated from the floor, yet the two exist in different worlds. In everyday parlance, 'floor' and 'ground' tend to be conflated. Some dictionaries add to the confusion, when for instance, 'ground' appears as a synonym of 'floor', but not vice versa.[36] Similarly, in relevant theoretical literature of architecture and logistics, the two are sometimes used interchangeably. Easterling, for example, writes: 'the ground or floor, more than merely the durable surface underfoot'.[37] But even more indicative is chapter 5 of Lyster's book *Learning from Logistics*, entitled 'Architecture/ Smart Landscape, Dumb Building: Ground Rules'.[38] Throughout the chapter she uses the term 'ground', either generically meaning 'the lower surface underfoot', or more specifically 'artificial floor', 'natural ground' or 'landscape'. She understands the ground at the same time in Robin Dripps's 'natural' manner, in landscape urbanism's 'landscape' manner, in Hadid's and Eisenman's 'geomorphological surface' manner, in the Laurentian Library's 'floor' manner and in WWII camouflage's 'artificial surface' manner.[39] Apart from the fact that many of these

views of the ground are mutually exclusive, this kind of misuse of the term arguably undervalues its meaning, missing its distinct potential. Grasping these two distinct natures is the first step towards the change of mentality and the project of interruptions we are aiming for.

Indeed, the difference between the words is not just lexical but also semantic. 'Floor' is an Old English word, then written flōr, and it stood for 'the lower horizontal surface of a room', but especially for one covered with boarding or parquetry. But significant is that its distant root (*pele), means 'flat; to spread'.[40] 'Ground', on the other hand, appears as grund in Old English, with its root (*grundus), meaning 'deep place'. It represented the 'earth' and the 'foundations', basically denoting the basal part of something, while the meaning could extend as far as the 'abyss' or the 'depths of Hell'.[41] Carole Biggam, in an article exploring the use of Old English words in architecture, concludes that 'the grund of a building is its horizontal base, either below or on the ground surface', yet it is in both cases 'invisible after the structure has been built'.[42] After all, and although uses of flōr have occasionally been synonyms of 'ground', the difference between the two has an almost spatial manifestation: both stand on the surface, yet 'floor' spreads, while 'ground' digs the depths; eventually the floor is visible while ground remains submerged.

This 'invisibility' of natural ground is arguably the source of the occurring conflation, and is a cultural matter, with deep roots in Western, especially European, post-Renaissance history. Ancient civilisations valued the ground either for its fertile or memorial capacity; Egyptians, Greeks, Mesopotamians, Chinese, and Native Americans celebrated cycles of nature or even established whole religious theories of afterlife based on it.[43] However, inductive reasoning and progress in laboratory isolation that arose during the scientific revolution of the seventeenth century, established, in James Corner words, 'a detached distance between the human and phenomenal worlds, enabling humankind to assume a position of supremacy over nature'.[44] In the process or rationalisation and mechanisation of the world view, the ground was discharged as a mere natural system that should be studied in order to optimise its rough and unstable qualities. Horizontal surfaces in developed civilisations were covered with 'floors', controlled and regulated surfaces, from the interiors to the whole city. Hence, the deep, erratic natural 'ground' of Old English has been buried under many covering overlays and subsequently forgotten, while a new 'ground' emerged, more superficial and more closely related to the floor. This 'new ground' is nothing more than the floor of the exterior, the floor in disguise. [Fig. 3]

The ground is no less invisible in the fields of architecture and urbanism. Rather expectably, architecture, as an art of taming the natural elements to establish a protective separation for human beings to dwell, has suppressed the ground. Aaron Betsky, following Vitruvius and citing creations as early as the ancient Greek temples, notes that the act of building has been one of defence or defiance against land and nature.[45] Robin Dripps notes that the ground is considered an abstract generic background so as to fit the need of architecture (and humans) to stand out.[46] The recent resurgence of the landscape following the emergence of landscape urbanism is, in fact, a step towards the reappearance of the ground. The idea of dealing with landscape operationally reveals the importance of process and brings new understandings of the ground as part of a wider ecological system. Nevertheless, sometimes, even within the realm of landscape urbanism, pure systematic thinking renders groundworks abstract again. Flows of materials, water, energy, or information may take us back to floor-like protocols. James Corner, in his frequently cited text *Terra Fluxus*, recognises the horizontal surface as one of the basic concerns of landscape urbanism.

As he points out, these surfaces, operating like continuous infrastructures, 'sow the seeds of future possibility'.[47] However, thinking of the overall exclusive and flattening nature of the floor we presented above, we believe it is the ground that allows for the potential of sowing; the qualities of the ground include not only 'promise' but also 'uncertainty'. Thus, a de-systematised understanding is imperative so as to arrive at new definitions.

The ground: assembling a toolbox

The claim for the invisibility of the ground seems counterintuitive when one thinks of contemporary western philosophy and especially phenomenology, where certain ideas concerning ground, terrain, and territory have been the subject of an immense discourse. The ground as pre-existing matter and an archetypical common operates as the cultural definition of a place; it is where physical geography and history merge to form Schultz's genius loci. The ground then negotiates issues of origins and identity, while certain thinkers extend its scope to issues of territoriality and sovereignty.[48] Yet this way of dealing with the ground only affirms the invisibility of its 'natural' nature. It is impossible to challenge the utterly 'productive' floor only by looking at the ground as an archaeological relic, one that carries history and heritage. Although very important, these elements are weakened in today's globalised world. Instead, we need to readjust our vision and look for the ground's distinct type of productiveness. This vision is in fact marginal, mostly evident in recent literature on degrowth and ecology, or certain food and farming practises. Following theories or practises like these, I believe the ground may emerge as an antidote to rebalance the dominion of the floor.

That such a project sounds simple, is because modern farming practises have become overly simplistic. Indeed, mainstream contemporary ground treatment seeks to transform it into some kind of floor: overspecified, perfectly smooth and utterly productive. Artificially aided, intensified monocultures exhaust valuable nutrients from the ground while also altering seasonal crop cycles. Representing the contrary position, chef Dan Barber describes his telling experience of improving their farm, by gradually adding livestock: goats to push back the forest, then chickens to improve the pasture, then cows to improve ground nutrients: 'as you get deeper into these symbiotic relationships, you're only improving the grass … To support the continual improvement of the whole system is the goal for better flavour.'[49] Barber's permaculture exploration emphasises diversity as the key to the productivity of the ground. It is exactly this combinatorial potential that I want to address: the possibility to accommodate and reconfigure fragments in no predetermined way. In her essay, Dripps reflects on the potential of the complex ecological system of the ground:

> Grounds operate with great nuance. They resist hierarchy. There are no axes, centres, or other obviously explicit means of providing orientation. Single, uncomplicated meanings are rare. Instead, there are open networks, partial fields, radical repetition, and suggestive fragments that overlap, weave together, and constantly transform.… Relationships among grounds are multiple, shifting, and inclusive.[50]

If anything, the ground is open and hospitable, which makes it a changing and fluid field, one that is hard to isolate and measure. If the floor is created with accurate calculations, the ground slips through them.[51]

This multivalence, volatility and inclusivity also suggest the acceptance of random and unexpected events, inevitably making the ground chaotic and unstable. And this, I would argue, is the reason why this way of being productive is radical; in its ultimate manifestation of inclusivity, the ground accepts errors too. Weeds are the most representative example, being a flaw by definition. Setting aside their interference in the human cultivation of crops – which is

a matter of human priorities – certain weeds can be noxious and invasive even in a naturally sustained ecosystem. Still, breeding weeds is considered a natural tendency of soils because of the nutrients diffused in their body.[52] Moreover, the ground also accommodates a multitude of other microorganisms that may under certain circumstances cause a nuisance. Nematodes and acarids that attack plant roots, illness inducing protozoans and very corrosive fungi form part of different complex interweaving ecosystems.[53] Although aberrant or harmful in certain placements, scales, or quantities, they are not recognised as errors to be covered or removed.[54] The ground's resistance to hierarchy, a notion well articulated by Dripps, stands for resistance to the unilateral or exclusive valuation of one system over another; one system's trash can be another system's treasure. In this way, more than just being cosmopolitan, the ground is truly open to error, being itself finite. Healthy soil exploitation requires fallow cycles, to allow for the replacement of nutrients and minerals. Unlike the infinite overwhelming expansion of its competitor, the ground is modestly and unpredictably fruitful.

Bringing these ideas together suggests a varied and bumpy surface; it represents a different understanding of productivity, one already celebrated by degrowth and ecology as mentioned above, but most importantly, one that the floor cannot grasp. Unlike how the latter would comprehend production, the ground is multifarious rather than homogenous, it is persistent rather than intense. Similarly, unlike how floor would comprehend disruption, the ground is rough rather than discontinuous, it consists of distinct finite elements rather than fragments. Here the language differentiation we are in search of starts to appear: the floor and the ground both 'say white' but they 'do not understand … the same thing in the name of whiteness'.[55] The vocabulary of this language consists of the ground's intrinsic characteristics we discovered above.

Openness, a variety of simultaneous systems, an interweaving of scales, finity, and deviation acceptance compose the aspects of the ground's software that we are interested in. However, this software does not strictly represent naturalness. Contrary to Dripps, who in her *Groundwork* speaks of the ground mainly as the 'natural' which has to get connected to the 'human-made', the ground's software is not to be limited in natural land, soils and landscape. Thus, I will not suggest assembling landscape design tools like hummocks, groves and soils to counter how transport is logistical. Instead, one has to look at how the floor introduced certain protocols to be applied beyond its literal material state: in the aforementioned example, an intensive mono-cultivation of corn in California adheres to the floor's precepts of smoothness and stability; as do the infinite greenhouse landscapes in southern Spain's Almeria.[56] Thus, the floor is not only about cement and tarmac non-organic surface constructions in cities. Likewise, the ground does not stand only for natural entities. Subsequently, the distinction I am maintaining throughout the essay does not correspond with the duality between natural and artificial, as it is formulated in Landscape Urbanism. Urban structures, like those of transportation infrastructure, may feature the ground software described above.

Ground floor: balancing interruptions

So far, I have separately elaborated the themes of the floor and ground, to make their strong but veiled difference visible; however, the two are found in constant mixture, especially in the case of transportation infrastructure, where flows are involved along with places. Resembling Deleuze and Guattari's oppositional metaphors like the smooth and the striated, the ground and the floor have intermingled throughout their history.[57] Indeed, although the 'smooth' spaces of the ground have been progressively striated by floors, in order to be controlled and measured, various scattered errancies and contradictions, from unpredictable weather phenomena

to pirates, sustain a certain smoothness.[58] Despite the prevalence of the floor from language to practise, the ground retains its dynamic of emergence. Returning to weeds and the other ground 'errancies' referred to previously, we see that they appear among cultivations, grow in the middle of neat natural reserves, and rise through cracks in cement. The ground has its own way of establishing diversity, filling in its competitor's gaps, taking advantage of its weaknesses.

Bearing in mind the constant mixture of the floor and the ground, 'the direction and meaning of the mix', and essentially their balance, becomes a crucial consideration.[59] On the one hand, weeds appear localised in places where they are not wanted, occasionally interrupting cultivations and natural reserves. Some crops may be destroyed, some indigenous or protected plants may be damaged, but farmers and preservationists remain united in their battle against noxious species, limiting their expansion and leading to a fluctuating balance. On the other hand, certain weeds and vagabonds may eradicate whole species, or even take over entire territories. Such a radical alteration that introduces a 'second nature' is reminiscent of an eruption process, a forcible alteration of a given context.[60] These two categories, abrupt eruptions and continuous fluctuations, represent two main ways in which the ground and the floor come together, mostly expressing the way the ground emerges to challenge the floor.

When the ground erupts, it mostly causes a temporary breakdown to the systems of the floor. Natural disasters and severe failures – like the road collapse in Fukuoka, legal or illegal occupations, like the vegetable markets held on streets with vendors replacing traffic, but also demonstrations, strikes, and even pirate operations – are some relevant examples. Lining up vehicles or bodies to block highways is a common form of demonstration. Spaces of pure unimpeded circulation are repurposed to accommodate different functions, different ecosystems, immobility and friction; the floor then collapses, wholly or partially, for its protocol is defied. The ground takes full advantage of the floor's systems, structure, weaknesses and narrative. Workers recently striking at the container section of Piraeus port understood its function as a chokepoint of Chinese container trade, as well as its impact on the business and shipping image of the port, and turned these to their advantage.[61] Because of their ability to provoke severe disruptions, the floor deploys any precautionary or suppressive mechanisms against ground eruptions. The container workers' strike was immediately deemed illegal by the judicial authorities. Privatised or vital highway arteries have altered their protocol to forbid any protest or other human presence in their domain, calling in riot police if necessary, like in the case of Interstate 10 cited above. Nevertheless, ground takeover is only temporary, retreating as soon as its energy erupts. The floor quickly restores its vital functions, thus giving 'eruptions' a floor-ground coexistence throughout a specific time range.

On the other hand, the ground may become evident in a much subtler way, intercepting the floor throughout its operation. In the case of transportation infrastructure, this could mean interruptions in circulation, distractions, and detours that cause delays. These become possible through the simultaneous existence of different transport or urban programmes. Shared spaces are a good example of the former. Although they seemingly support an infinity of flows, they do encourage interruptions; drivers and pedestrians, two ecosystems with different goals and standards, are encouraged to negotiate a common field. In the completely informal, non-designed 'shared spaces' of intersections in Delhi, different transport systems interweave: pedestrians, carts, bikes, rickshaws, buses and sometimes trains or elephants, adjust

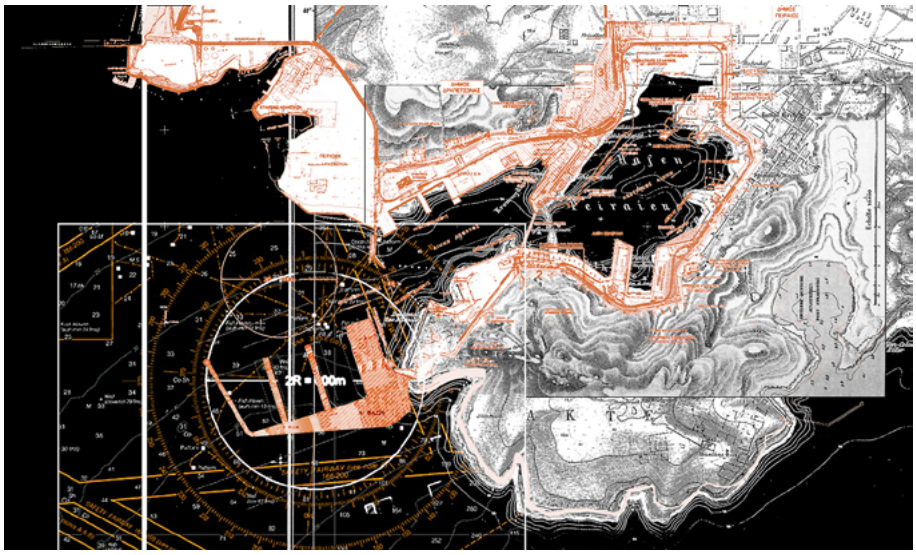

Fig. 3

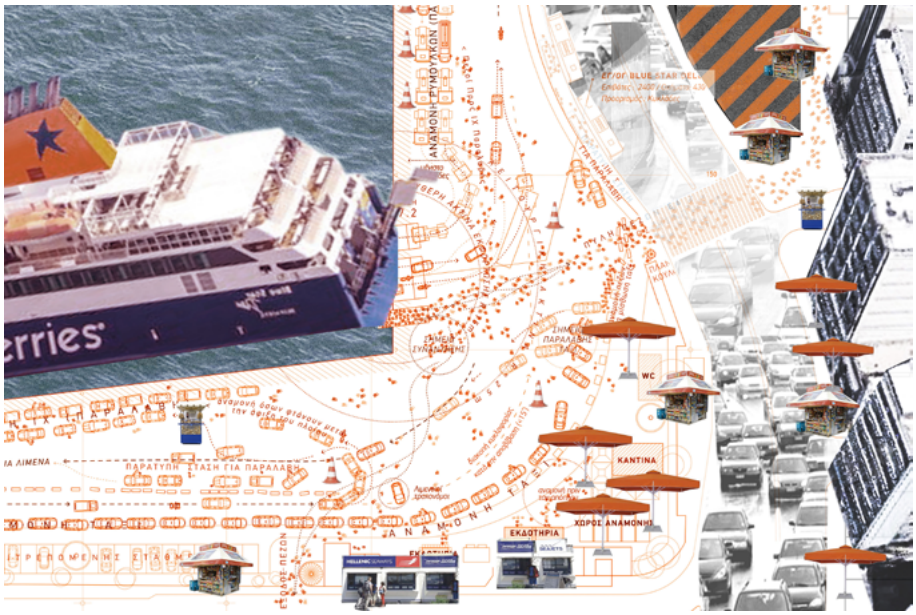

Fig. 4

Fig. 3: The floor that hides the ground. Recent privatisation of the port of Piraeus, Athens's ancient harbour, revealed a new master plan proposal for the port, including a massive six-place cruise ship anchor platform, overwhelming the physical geography of the peninsula and the natural port. The floor of tourists circulation, resembling that of a cargo port, overlays the ground, making it invisible. Digital collage: Jenny Lazari and the author.

Fig. 4: Ground floor fluctuations. Kiosks, vendors, cafes, and ticket booths merge with cars, passengers, and ships in the port of Piraeus, creating a complicated diagram; human relations and their movements reveal the ground within the floor. Digital collage: Jenny Lazari and the author.

their speed and sometimes their course to reach an equilibrium. Furthermore, an example of diverse programmes coming together in transport infrastructures can be found in the port of Piraeus; a part of the liminal space between the sea and the city is occupied by diverse entities like cars, bus stops, kiosks, ticket booths, refreshment stores, street vendors, and ships, each belonging to a different ecosystem of distinct spatial and temporal understanding. [Fig. 4] Hundreds of people pouring from the arriving ships, periodically impede car traffic on the seafront, ignoring zebra crossings and traffic lights. Conversely, heavy car traffic frustrates individual travellers who reach the harbour on foot, as they have to wait for the green light while their boat already lifts the gangways; kiosks, street vendors, and people in nearby refreshment stores and bus stops literally stand in their way. This peculiar infrastructural spectacle, is also enriched by a non-travelling audience who fish, take their dog for a walk, or just watch the ships blow their horns, complicating the task of the officers who regulate boarding. Like a parasite, the ground emerges in the body of floor, occupying its gaps and creating new ones. The ground takes an active adaptive form, making it difficult for the floor to locate and suppress it.[62] Eventually, with 'fluctuations', the floor and ground coexist in both space and time.

Given the prevalence of the floor described at the beginning of this essay, the ground's efforts to surface define its political repertoire, so long as they consist of an act of opposition; both eruptions and fluctuations are strategies to counter its appropriation. However, their categorical difference is important: following a distinction evident in Rancière, eruptions are more like resistance, whereas fluctuations are more like dissenssus. The former oppose a given context of rules, whereas the latter invent their own. Eruptions may be limited to being instantaneous mirrors of the floor, whereas fluctuations are always original strategies of another language. That said, and although eruptions are useful offensive acts of defence, it seems that fluctuations make up a stronger strategy to address the floor in the long run.

In any case, a more balanced relation between floor and ground is best pursued at the ground floor level, where the city meets the cars, the buses, the trains, and even the ships. It is perhaps not by chance that the two words meet each other there; most instances of transportation infrastructure are necessarily expressed on the ground floor, for the public to reach them. There, all sorts of different systems are capable of establishing seemingly disorderly relations and distractions. Besides, the floor is always trying to escape the complexity of the ground floor with fences, buffer zones, and concealed spaces. Useful for some while distracting for others, conflicts of purpose and temporal clashes on ground level configure a real open-ended field of potentials, yet often at the risk of even missing the boat. Eventually the ground floor tells stories of things that will not always 'work'.

Epilogue

As circulation and flows increasingly structure urban contexts in their totality, one would think that the software of the ground could be considered as generally applicable throughout the urban realm. However, we focus solely on transportation infrastructures, since unlike other public spaces, they perform under strict functional protocols. In the interface of places and flows, they seem to represent Castells's idea for spaces where 'the geography of the new history' will take place.[63] Public squares and parks may also be influenced by circulation, but passenger ports and metro stations are arguably more critical, because they have to respond to specific functional ends. Within a positivistic mentality, the performance requirements 'justify' the mono-cultivation of the floor, which becomes the end, rather than remaining the means. Initially conceptualised to serve lifeless

items, it expands in spaces of people's circulation, imposing its effective overdetermination, and eliminating spatial experience.

Nevertheless, the goal is not for the ground to take over, but rather to enter a state of reciprocity with the floor. James Corner, speaking about the paradox of the simultaneous precision and errancy of modern measurement, he comments: 'The aporia of modern measure … might actually present a situation that ought to be neither negated (poets, environmentalists), nor affirmed (technocrats, engineers) but, rather, critically appropriated and imaginatively redirected for its full, liberating promise to appear.'[64] Transportation public spaces have to balance between determinant variables, statistics, and network restrictions on the one hand, and human approximations, spontaneous desires, and intuitive determinations on the other. This recalibration is essentially a political project, not only in order to define the point of balance between the opposing forces, but also the nature of their relation. Especially in the case of fluctuations, which is a highly undiscovered field, architecture can have a definite say in inventing and designing active forms, breaking the codes of smoothness, and working with errors.

Hence, instead of debating the possibility of directing flows, I propose a reorganisation of the ontological characteristics of the ground to imply finity, imperfection, abnormality and unexpectedness, to speak a language that the space of flows does not understand and therefore cannot suppress, assisting the space of places to re-emerge. The acceptance of errancies suggests more than the typical claims of consensual diversity expressed through allegedly 'mixed' programmes of shopping malls inside train terminals. The ground software is about the symbiosis of different ecosystems, which although perhaps complementary, will inevitably develop larger or smaller areas of friction and conflict between them; different ecosystems work at different scales and have different standards, meaning they understand different things as 'right' or 'wrong', as 'efficient' or 'interrupting'. Rania Ghosn, commenting on Rancière's ten theses on politics, writes: 'Architecture is political when it engages in a quarrel on perceptible givens, calling into question nothing less than the spatial and perceptual organisation of our world'.[65] In the spaces of circulation, architecture should challenge this very protocol of circulation; in transportation infrastructure architecture should challenge the identification of subjects as mere passengers.

Notes

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33. Notably, the concert was to be held in memory of Pavlos Fyssas, who was murdered by members of the far-right Golden Dawn party in September 2013. See the website of Keratsini-Drapetsona municipality: https://goo.gl.
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61. Cowen, *Deadly Life of Logistics*, 126–7.
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Biography

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