In the context of logistics regimes, in which friction is the enemy, the presence of humans becomes a special kind of irritant. These systems and spaces designed for our own fulfillment are both outpacing and excluding us. Consider *Eagle Eye*, a film about a mysterious computer system that ensnares two strangers in its machinations. In a key chase scene, to help the protagonists evade an FBI agent, the computer guides them into an airport's automated distribution hub, effectively inviting them into its world of machines.[1] As they tumble down a series of belts and rollers, the heroes' poor fit is initially an asset. In a bout of slapstick, a low beam clocks the agent giving chase and sends him sprawling backward on the belt, buying enough time for the quarry to gain some ground. The computer system ultimately takes command of the outcome: disguising all the bodies as inventory, it diverts the agent to another part of the warehouse with the help of the mechanical belt sorters.[2] Here, humans are rendered in the computer's 'vision' and register not as bodies but as boxes with pop-up annotations that read "Error: No barcode, destination unknown." This suggests that all elements passing through the computer's gaze will be translated into a consistent metric. While *Eagle Eye* is a product of Hollywood, logistical modes of seeing share the tendency to treat all material within a system as data points to be managed. The industry produces habits of mind that imagine material as data while nonetheless seeking ways to physically handle it. Understanding the world through such abstraction accelerates processes of externalization as *all* decisions increasingly become problems of management and allocation. To an inventory control system, every *thing* and every *body* becomes both a parcel and a data point. As the technologies and practices of logistics increasingly spill out of enclosed worlds of the kind depicted in *Eagle Eye*, we humans will be challenged to make our way alongside them.[3]

To mediate between these escalating incompatibilities, material handling companies have developed augmenting technologies that make it possible for human workers to function within the demands of the logistical environment. To meet their quotas, warehouse employees rely on a host of mobility augmentations to increase both their speed and their range. So-called Automated Storage and Retrieval Systems (ASRS) create a human–machine assemblage in which automated order fulfillment mechanisms transport human 'pickers' to the right location in space, at which point they select the appropriate items to add to the order. The logistical environment is also an encrypted one, and so technologies like wearable computer-scanners are required to navigate its illegible surfaces. As managers and company owners seek ways to increase output and profit, voice-directed picking systems subject the contemporary fulfillment center worker to the demands of software protocols. With these systems, the software can be programmed to communicate in the native tongue of the person it is directing, meaning that the humans embedded in this environment do not necessarily have a shared language to communicate with each other; nor

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Para-Logistics and Useless Inhabitation

1   For an in-depth description of the interior of a UPS sorting center, see John McPhee, "Out in the Sort," in *Uncommon Carriers,* Farrar, Straus, and Giroux, New York 2006.
2   "Dematic FlexSort SL2," dematic.com (*www.dematic. com/en-us/flexsort-sl2/*).
3   *Eagle Eye* is loosely based on an Isaac Asimov story in which an omniscient computer regulates society and preemptively stops crimes through predictive modeling. Issac Asimov, "All the Troubles of the World," in *Nine Tomorrows: Tales of the Near Future,* Fawcett World Library, New York 1959, pp. 137–153.

can they decipher the barcode-encrypted surfaces.[4] As the spaces of logistics continue their transformation from mechanized to entirely automated, the ability to interact with these environments becomes increasingly dependent on mediating and decrypting technologies. Even if these spaces and systems are products of human ingenuity, and even as their contents reflect some idea of fulfillment, access to them becomes more remote. As the habits of mind that form in the space of logistics are biased toward control and efficiency, and as the industry, in its expansion, serves as a training ground for those seeking power or influence, we should not be surprised if the same values of logistics are asserted on spaces beyond the thin enclosures of fulfillment centers.[5]

Logistics aspires to a seamless world of complete operational visibility and asymptotic efficiency in which all friction has been smoothed, all throughput accelerated, and all positions accounted for.[6] Such aims acquire political weight as their pursuit entails various disruptive incursions. To increase the potency and reach of consumer micro-targeting, potential customers are tracked, profiled, and addressed in intimate isolation. In the case of the remote fulfillment of orders of consumer goods, multiple tiers of delivery mechanisms are in constant motion as they relay parcels from one point to the next. In built up urban areas, this burden is taken up by a precarious workforce at the mercy of the demands of much larger corporate actors. This holds true in the warehouses, distribution centers, fulfillment centers, port facilities, and delivery networks.[7] The vast automated environments of logistics tend to dehumanize workers and to subject them to various forms of insidious discipline and control.[8] The consumer objects moving through these spaces are nonetheless, of course, manufactured somewhere and that process of transforming raw material into a sellable something is further externalized and abstracted through the mediating tendencies of logistics.[9] As much as logistics imagines that its operations occur in the ideal space of the computer model or the database, such operations are heavy with spatial, material, and environmental baggage. The more that companies like Amazon work to make time seem to disappear, the more space must be encumbered somewhere to make that possible – a kind of architectural equivalent of the portrait of Dorian Gray, conjured by our eager embrace of convenience, that appears in the flattened landscapes and sprawling spaces of preparation, distribution, and delivery.

Already overwhelming, the force of these systems continues to accumulate through the relentlessness of capitalism and – crucially for architects, urbanists, and environmental designers – through the medium of space. If we can accept that the challenges posed by logistics have distinctly spatial and material properties, then we might seek to meet them through design – not necessarily head on (knowing how logistics works) but rather more obliquely, through seduction or surprise or other counterintuitive angles. Rather than a symmetrical and binary counter-logistics, what might a para-logistics that allows alternative imaginaries and attendant aesthetics look like? The prefix itself is hard to nail down. The Greek root *para-* means "alongside, beyond; altered; contrary; irregular, abnormal," while the Latin *parare* is "to be ready" and suggests "defense, protection against; that which protects from." In this sense, a para-logistics might be imagined as both an alternative space of logistics and a pre-emptive response to it. Standing outside of normative systems but also poised to respond to them, para-logistical systems might contribute to a diversity of ways forward.[10]

If, as described, above, logistics drives the realms it encounters toward efficiency and leanness and austerity, then design – itself a field that often relies on a certain amount of excess to achieve its qualities – can struggle to find purchase. Indeed, engaging logistical design in a straightforward way might be neither possible nor the point. Nonetheless, when viewed from a certain angle, the logistics industry has its own forms of abundance and slack, elements that might be redirected toward alternative ends, toward congestion and irrational use, for example, rather than smoothness and efficiency.

The physical environment of logistics could be one such realm. The inland ports of the United States take shape as a carpet of low-slung and blank horizontal enclosures – the familiar landscape of light-industrial districts and intermodal warehouse facilities that dominate much of the urban fringe. But peel away the nondescript enclosures and the interiors of these spaces can offer a kaleidoscopic richness through the accumulated density of storage equipment and inventory. The building blocks of these environments are industrial shelving systems, robust elements designed to be quickly assembled or disassembled and to hold large amounts of inventory at different frequencies. These pallet racks exist in abundance and are frequently used in multiple sites, reinstalled in other warehouse applications. In a sense, they are a pure logistical material designed to behave with exactly the logics of the larger systems they support. They are specific in their use and design but also productively neutral. Because the shipping pallet governs the dimension of the racks, there is an awkward humanness to their depth and width – not at all domestic but also not entirely industrial either. The racks' construction suggests a cross between equipment and furniture but their scale, order, and repetition create organizational and spatial effects that are fundamentally architectural. Each unit is a clearly identifiable object and yet, in aggregation, it is lost in the larger mass. The pallet rack is an ideal if illegible architectural mascot of logistics.

For the 2018 MoMA PS1 Young Architects Program my office developed a proposal that diverted a large number of industrial pallet racks to create a prototype for a temporary public space. While these are familiar objects, taking them out of their original context and reconfiguring them into a large inhabitable array invites new activities and physical investigation. The racks form a matrix of aisles and cross-aisles that stands at almost three stories high, peering over the 15ft-high perimeter wall of the PS1 courtyard. Selective removal of rack elements generates a collection of gathering spaces to be discovered while

Shelf Life, LeCavalier R+D's runner-up proposal for the 2018 MoMA PS1 Young Architects Program. Projection drawing showing selective removal of racks creates clearings connected by overhead tracks. Furniture insertions, stacks, offer a range of possibilities for use.
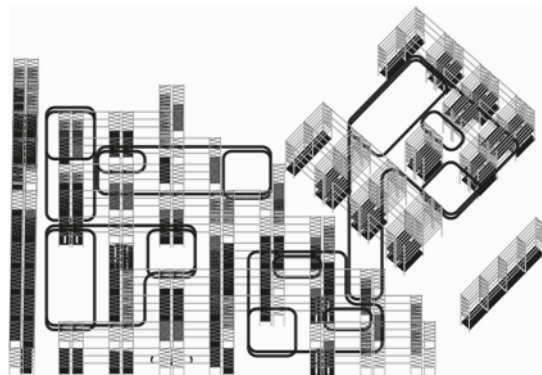
4   For further discussion, see Jesse LeCavalier, "Bodies: Coping with Data Rich Environments," in *The Rule of Logistics: Walmart and the Architecture of Fulfillment,* University of Minnesota Press, Minneapolis 2016, pp. 151–178.

5   Walmart, for example, often grooms its logistics managers for executive positions, e.g. CEO Lee Scott.

6   Langdon Winner addresses the challenges of reification when engaging such phenomena. He writes, "The charge of reification, however, loses some of its impact if one considers that social science consistently reifies concepts such as "society,' 'family,' and 'bureaucracy.' One is hard pressed to think how it could do otherwise. Since we cannot have all that we wish to talk about immediately present as empirical referents, we must employ symbols to represent phenomena." Langdon Winner, *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought,* MIT Press, Cambridge (MA) 1977, p. 42.

7   Bryan Menegus, "Amazon's Last Mile," Gizmodo.com, November 16, 2017 (*gizmodo.com/amazons-last-mile-1820451224, accessed September 19, 2018*).

8   See Deb Cowen, *The Deadly Life of Logistics: Mapping Violence in Global Trade,* University of Minnesota Press, Minneapolis 2014.

9   See, for example, Rob Nixon, *Slow Violence and the Environmentalism of the Poor,* Harvard University Press, Cambridge (MA) 2013.

10   Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins,* Princeton University Press, Princeton 2015, p. 65.

Shelf Life. Interior view of an apparel warehouse managed by the materials handling company, Headzup. Hanging garments are queued up, ready for delivery for the next season.

Shelf Life. Densely packed inventory, suspended from overhead tracks.
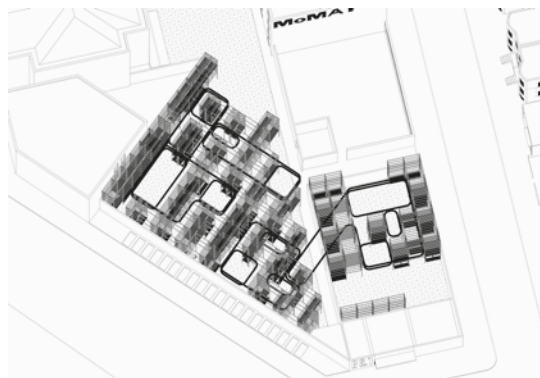
exploring the space of the project. Through some simple structural modifications and the economical use of existing walls, the pre-engineered elements are bundled together for stability, allowing most of the bracing at the ground level to be removed entirely. This effectively creates a ground plane with a massive structure floating overhead, almost like a forest canopy.

Threading through the racks, overhead tracks are assembled from standard conveyance systems, like those a dry-cleaning company might use. They are conduits of light, sound, and fog that generate variegated atmospheres in the clearings while also serving as wayfinders to guide visitors into the depths of the project. The tracks help to delineate the spaces of the installation and, through their dynamic uses of cooling and lighting, generate its shifting atmospheric qualities.

'Stacks' of custom furniture elements are built into the racks from off-the-shelf components, providing a range of inefficient and non-productive possibilities for human inhabitation, with elements enabling both active uses like ping pong tables, and more passive ones like hammocks and lounge chairs. The furniture elements are integrated into the design to create possibilities for more intimate experiences while still supporting the open clearings provided for larger gatherings. However, because the racks are designed to accommodate industrial pallets, the furniture plugins necessarily acquire unfamiliar and awkward dimensions, slightly larger than normal, perhaps inviting a renewed awareness of bodies – one's own and others' – in space.

Once the season concludes, the elements of the project are disassembled and reintegrated into the logistics streams from which they were initially appropriated. The overall form of the proposal is loose, based more on the local particularities of the given site. However, if that context or geometry were to shift, the systems' design can adjust accordingly. Assembling a large quantity of pallet racks in a new context produces certain qualities that reinforce some of the ambiguities inherent in logistical regimes. The project is diagrammatic in its organization, but that simplicity gives rise to a more complex spatial order. Representations of the project are correspondingly both flat and volumetric. There are moments when the constitutive elements are recognizable but often the part is lost in an ambiguous and unstable whole. By rendering the rack useless in its intended purpose new and delightfully inefficient uses emerge. The project is imagined as something to be discovered in a non-linear way and uses the materials of logistics – themselves designed to enable smooth speed – to introduce congestion and friction in search of wilds of a different making.

Shelf Life in its context of the MoMA PS1 courtyard. The main entrance to the museum is in the lower right and the open space in the upper center is where the museum's weekly concert series takes place.

Site plan indicating the relationships between the racks, tracks, and stacks, as well as the spaces they create together.