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Tokyo's Train System: The Interaction between Culture, Technology and Urban Design

Public transit system are the pulse that beats through any modern, dynamic urban centre. In few other cities is the importance of mass public transit clearer than in Tokyo; train lines snaking between residential buildings and skyscrapers, hordes of people moving through stations at rapid pace and brutal efficiency, these are all images of Tokyo that embed themselves in the global imagination, and form a key part of Tokyo's urbanism.

Tokyo is particularly renowned for its high quality train system, in large part due to its technology. The metropolis' trains have reached a point where technical faults are not a major problem impacting efficiency, as for example might be the case in New York - with faulty switches, poor track maintenance. Hence, the main concern for operators in terms of maintaining efficiency in their systems is to decrease dwell times as much as possible, and ensure a fluid, consistently efficient experience for commuters.

What becomes evident as technology reaches a point that is difficult to improve is that commuter culture plays a large role in the efficiency of a transit system, particularly one operating at such high capacity (and beyond capacity) as is the case for Tokyo. The more time you spend in Tokyo's train network, the clearer it becomes that three key facets play a role in this efficiency: commuter culture, urban design, and technology. All these tenets interact and work together to form an efficient commuter rail network. What this project aims to explore is just how these three facets actually work together, through an analysis and ethnography of Tokyo's commuter culture.

I spent two and a half weeks in Tokyo, during which I spent peak commuter rush hours observing the behaviour of commuters, and participating as a commuter myself. My research involved field notes, photographs, timelapse footage and sketches, all in an attempt to familiarise myself with the experience of being a Tokyo commuter as quickly as possible, whilst constantly considering any link between this experience and the efficiency of the system. Obviously I do not claim to be an absolute authority on Tokyo's train system, nor its commuter culture, after two and a half weeks, but I do believe that this was enough time to provide significant insight into the Tokyo commuter experience.

As mentioned earlier, dwell times become the primary source of concern for Tokyo's train operators in times of high system usage. Michael Fisch, in his extensive ethnography of Tokyo's commuter rail system, *An Anthropology of the Machine*, outlines a concept that I believe is important to keep in mind in any observational study of Tokyo's rail network. This concept, which he coins the 'interval', refers to the way that trains operate in peak hour times, and the way that commuter behaviour changes as a result. Enabled by advancements in technology and signalling, when trains operate in peak hour, operators focus not on getting to each station at a specific schedule, but rather to maintain a consistently small interval time (or dwell time) at stations. What Fisch coins 'finessing the interval' is the way in which this interval is decreased to a point of near impossibility. Trains operate well beyond capacity at this time of day, with the term 'finesse' connoting this notion of impossible efficiency; this efficiency is enabled by the behaviour of passengers, the skill of train drivers, and the efficient syncing of all elements of the commuter system.

This paper will explore in more depth just how this interval is finessed and how commuter culture is created, while keeping in mind the reality that this experience is by no means necessarily pleasant. The paper will then explore a spatial anthropology of Tokyo's

train stations, and the in-train experience, both in substantial depth. These parts of commuting, whilst not necessarily fine-tuned for efficiency in the same way as commuter culture, nevertheless are important parts of commuting to consider.

Ultimately, what becomes clear is that Tokyo's transit efficiency only becomes possible through an efficient interaction of technology, urban design, and culture; this paper aims to explore just how that interaction plays out.

Public transit as a core tenet of Tokyo

Upon a traveller's first steps out of a plane in Tokyo, whether at Haneda or Narita airport, the first thing that this traveller sees is the huge signs hanging overhead showing train departure times. As a traveller arrives in the city itself, most likely by train, their first glimpses are of the sprawling metropolis filled with mid-rise buildings with dotted skyscrapers through which a plethora of continuously changing, combining and disbanding train lines weave. If there is a defining aspect of Tokyo's urban landscape, apart from the sheer number of people and the bright neon lights at night, it is almost certainly the multitude of physical, above-ground train lines that are visible. Indeed, the surface lines are only an outward presentation, a tip of the iceberg, of the plethora of transit systems that exist in the city, with subway lines underground not actively visible to an observer of the urban landscape, but certainly present in the minds of residents of this city.

In her recent book, *Tokyo in Transit: Japanese Culture on the Rails and Roads*, Alisa Freedman delves into the extent to which forms of transit and transportation have played a role in the collective culture and experience of Tokyoites, and of foreigners' perception of the city. "The sight of long trains rapidly snaking between skyscrapers, and of commuters...flooding station platforms, characterizes the allures and difficulties of Tokyo in the global imagination" (5). It is not just the train lines themselves, however, that form core

to a collective urban culture, but stations as places themselves. Freedman speaks about how stations started publishing magazines in attempts to profit from the burgeoning culture of reading for pleasure, and the universalisation of literacy. Urban sketches, or short stories written by popular authors, formed a part of these magazines, largely in an attempt to lure in readership. These were stories set in stations or on the streets surrounding them. Freedman argues that through this, the concept of transit, but particularly the stations themselves, became engrained in literature, which in turn informed collective urban culture, and was simultaneously a reflection of that urban culture. (128) "The terminal afforded a different view of Tokyo society than could be seen on its trains, streetcars, buses, and taxis" (117-18).

Freedman's extensive work documents the further ways in which transit cemented itself as part of urban culture, and I would argue that the literature that was produced was almost certainly in part informed by the landscape of Tokyo itself. While the cultural importance writing and literature is not as immediately obvious to a foreigner as the sheer immensity of the physical train lines weaving through the city, it is nevertheless evident how central transit is to life in the city.

Looking back historically, this change in literature occurred simultaneously with the development of railroads. Through Hidenobu Jinnai's book, *Tokyo: A Spatial Anthropology*, a history of the urban experience of the city can be examined. Most notably in regards to the train lines was the "reorientation of the city from water to land" that occurred in tandem with "the development of the rail-roads". These "changes strongly influenced the redefinition of Tokyo's urban space", and this redefinition is likely at its most clear when walking through the city today. (174)

An observation of the railroads physically, however, is insufficient to infer any understanding of the urban culture of Tokyo itself. Whilst physical terrain and urban design

certainly informs this culture, this culture is informed by more than the experience of simply living among train lines. Paul Noguchi's text *Delayed Departures, Overdue Arrivals: Industrial Familialism and the Japanese National Railways* principally examines the workplace culture that was formed as a result of the denationalisation of Japan's railways in the late 1980s. However, Noguchi also exposes the way that railroads engrained themselves in collective urban culture. Focussing on children, Noguchi states that "[k]nowledge of railroads acts as a unique agent of socialization in Japanese cities. In an urban environment a child learns very early in life that a thorough knowledge of station stops is essential for urban survival". Furthermore, it is not just the train stops but the "hazards of crowded platforms and uncomfortable riding facilities during the rush hours" that are socialized into the urban understanding of Tokyoites.

To sum up and connect the observations of these three texts, Tokyo, as an urban landscape in the way it has evolved, in its literature, and in the way that children are raised and eventually come to understand the urban environment as adults, is inextricably connected to the train lines and their centrality. Train stations, crowding, the boarding process, the stops, the experience of riding a train, all of these elements of urban life are existent to a large extent in most Tokyo residents' lives. To form an understanding of Tokyo's urban culture, one must at the very least consider the role that these train lines play in said culture.

Relating this culture to efficiency is what the rest of this paper aims to do. Clearly, public transit and trains form a core element of Tokyo's culture; in turn, what does this culture actually look like, and how is it efficient? Additionally, however, I would argue that the mere fact that this culture exists to such a deeply-engrained extent is an important element in the fostering of efficiency. On a first level, people are already familiar with the operation of the train system, and become familiar with it from a very young age. Hence, when certain

actions need to be taken by commuters to maximise efficiency (as this paper will delve into), these actions and customs have already been socialised early on. There is no need for passengers to constantly learn and adapt, but it merely forms an unspoken way of navigating the urban landscape. On a second level, I would posit that the aspects of the system that may otherwise be perceived as annoying - the bumps from other commuters, the significant overcrowding - are not perceived as quite as frustrating when Tokyoites have grown so accustomed to such annoyances over time.

Continuing on, the rest of this paper will examine how this culture of commuting eventually maximises efficiency.

Forming an Efficient Commuter Culture

Commuter culture in Tokyo is unique and somewhat magnificent in its consistency and efficiency. When stepping into a station for the first time, especially one of the scale of Shinjuku or Ikebukuro station, a commuter is greeted by swathes of commuters rapidly moving through tunnels, grouped together hurriedly descending wide staircases or escalators, with barely a confused look from anyone in the premises. At first look, this seems to be peak chaos, an immensely confusing swarm of commuters that is impossible to join, but once you begin to understand and become familiar with the system, the facade of chaos fades to reveal significant order.

This is arguably no clearer than on train platforms themselves, particularly the wide and open-air platforms of the JR lines. Two of the most over-crowded JR lines intersect at Shinjuku station: the Chuo-Sobu line, and the Yamanote line. Both trains run with headways of roughly 2 minutes at peak hour, and trains in either direction share the same platform. It is difficult to estimate just how many commuters are on the platform at any given time, but standing on the platform and watching the masses alight and disembark trains is fascinating.

Commuters line up at each train door patiently waiting for a train to arrive. As soon as a train does arrive, the group of commuters aligned with each door move towards it, and form a sort of guideline for those exiting the train - they surround the doors in a way that does not impede those disembarking, but instead gives them a clear and explicit direction of how to exit the train, get to the platform, and get to their next direction.

It seems impossible to believe that a platform could facilitate such a constant mass exodus and influx of people, but every 2 minutes, the flux and flow continues.

This commuter culture is by no means unique to JR lines either. Spending time on the most heavily-crowded line in the entire Tokyo train system, the Tozai line, this efficiency continues. Passengers line up in an orderly fashion, wait for on-board commuters to disembark, then orderly alight the train themselves. Even with the natural space constraints of underground stations, the culture pervades.

If commuters in line cannot fit onto the train, then they simply wait for the next one. The fact that they are already lined up means there is a clear distinction of who is next to board a train, and who should wait if they cannot all fit. Much of the frustration of not being able to board a train, however, is offloaded by the fact that there is a train every 2 minutes; missing this train is very unlikely to make you late for work or school - the next one will get you there on time.

This commuter culture leads to efficiency in main part by reducing the amount of time that a train spends at a station - a train's dwell time. The main cause of delays to a train

system with such little headway between trains is dwell time delays. If one train gets held up at a station, whether by commuters simply being inefficient at boarding, or whether by passengers holding open doors or trying to force themselves onto trains, this can easily cause a series of knock-on delays that can affect the entire system. Tokyo's commuter culture helps prevent these delays.

The formation of an efficient commuter culture

The way in which I believe this culture is formed, whether in Tokyo, or in any other train system, is through the establishment of a consistent and easy-to-follow habit through station design. Good urban design, through not only informative signage - directions of where to go to get to whichever platform for whichever train, or directions of how to interchange between trains - but also through what I will call 'directive' signage is important to establish habit within commuters. Tokyo's system is particularly effective at using this form of directive signage and design, and this in turn leads to its effective commuter culture.

A key part of this directive signage as well is that it be consistent, obvious, and omnipresent. If this design is only present at a couple of stations, or perhaps only on one train operator's platforms, then it will be difficult to establish habit within all commuters. It needs to be consistent throughout any given commuter's experience with the system in order to be established within their understanding of the operation of the system.

Upon seeing this directive signage so consistently through the system, commuters form an understanding of the expectations and needs as they use the system. This then forms the basis of a habit that is established within people - it becomes a norm and unintentional way of acting, no matter what station you are in. As you adapt and come to understand the platform signage and layout, you begin to act in a way that is more instinctive, less cognisant of the directions that you are subtly being given. Whether the brains of commuters are

subconsciously processing the signs and indications of where to go, or whether these actions merely become such a strong habit that they feel like intuition is unclear; regardless, of its source, this habit becomes engrained within commuters. After some time, this habit becomes so engrained that it becomes part of the culture of commuting, a subtle and non-explicit way of using the system, and one that leads to peak efficiency. However, this culture is not formed merely as an organic byproduct of Japanese culture, but rather through careful design choices that take into account Japanese, and particularly Tokyo culture. It is in the interaction of design and culture that this efficiency is maintained, and that the commuter subculture is created.

Line markings on platforms are the first of a series of cues that help to establish this habit.

Michael Fisch spends some time exploring just how commuter culture can be manufactured, in his case looking at the way that in-train culture is created. He looks to 'train-manner posters' as an example, but importantly notes that these posters "do not produce train manner". Such posters are not "disciplinary technologies that effect commuter compliance to behavioral standards". Rather, the "manner poster elicits a sense of a collective by calling attention to the existence of manner through its violations." (Fisch, 62-3) Similarly, I would posit that station signage, whilst being somewhat directive, instead works in a more subtle way than merely disciplining obedience. Instead, as commuters use the system, they become aware of the harm caused by the violation of this culture - harm not only to other commuters, but to themselves. Over time, as more and more commuters become aware of this

harm, behaviour shifts more and more consistently towards an efficient culture, rather than the other way around. The signage is merely a catalyst that enables this shift to occur.

Indeed ultimately, this habit and culture of commuting that is formed renders the signage almost unnecessary - people begin acting in this way instinctively, moving efficiently through stations and lining up organically, without the assistance of signage to guide them. It is not uncommon to stumble upon a smaller station where these line markings on the platforms are not present (except for perhaps some indication of where the doors will line up with on the platform), yet people still line up waiting for a train to arrive. Interchanges are often found in stations where there are no signs directing people to stay left or right, yet the consistent group movement still continues. Sometimes signage is actually disobeyed, with the designated ‘up’ section of a staircase reserved for those descending, yet efficiency is maintained through the fact that everyone acts in the same way following the unspoken rules

that facilitate the efficient movement of people. If people are acting in this way independently of or actively against signage, then I believe that it is due to a commuting culture that is created and developed within commuters.

Up/down arrows create habit of how to go up and down stairs, to the point where people always form an orderly group going up and down etc.

Effects of this culture on efficiency

As already discussed, when engineering problems are ruled out as a cause of delays, dwell times become the primary concern for train operators. Research has been conducted into the way that train and platform design can impact dwell time delays, but some of this research has overlooked the importance of passenger behaviour and commuter culture.

Thoreau R et al.'s research is an example of the under-consideration of this important aspect of efficiency. Even in the one photo of their experiments that was included in the

report, there was a far-from-efficient method of boarding that was followed by test commuters. People were running into one another, with subjects trying to board who were crowding the door exit space. The results of the research showed that “none of the scenarios showed consensus on any of the design features tested”. Hence, if we are considering how Tokyo’s commuter culture relates to the efficiency of dwell times, it is unlikely to be as a result of door width, platform size or platform setback, but rather as a result of the commuter culture contrived in Tokyo, and the way that it interacts with the technology and design that is present.

It is difficult to envisage a way of boarding and alighting trains that is more efficient than that which is common in Tokyo. What is unique about Tokyo when compared to other systems around the world is just how stringently this culture is followed by all passengers.

This is not all to say that Tokyo has reached a point where it is the most perfect commuter culture that enables peak efficiency. There are obviously times where commuters do not follow this culture well enough to be efficient. For example, sometimes while riding, a commuter will realise last-second that this is their station, will attempt to alight, and will run into the influx of passengers that believed that they had already waited for the exodus from the train. This causes disruption, as this mistaken passenger has to fight his way through the new influx of visibly annoyed and frustrated passengers, and potentially even causes the train to wait longer at the station. It’s hard to tell just how common these occurrences are, and shows just how important it is to have full participation in any commuter culture for it to remain effective. Nevertheless, Tokyo reaches an extraordinary standard of consistent participation from commuters that makes it one of the most efficient in the world.

Intersection of Technology and Culture

Culture forms only one part of an important intersection that is necessary for efficiency: the intersection between technology and culture. Culture alone cannot lead to efficiency; at a base level, an efficient boarding culture does not really matter if trains often break down or face signalling faults. Similarly, a train system may have the most efficient, technologically-advanced trains in the world, but that matters little if commuters are not boarding efficiently and cause dwell-time delays. What became evident through my experiences on the Tokyo train system was the necessity of an active interaction between culture and technology. It is a bidirectional relationship, with culture and technology informing one another to ensure an ever-evolving system that continually attempts to be as efficient as possible. Commuter behaviour adapts to the technology that is provided, and the technology is designed with commuter behaviour in mind. When both are as in sync as possible - as I believe Tokyo comes close to achieving - then efficiency becomes merely a by-product of an effective relationship. As Paul Noguchi notes in *Delayed Departures, Overdue Arrivals*, "the [Tokyo] ridership's dependence on the precision of train operations… sets the tempo for the commuter culture" - it is an integrated, bidirectional relationship between operation and culture.

On a macro scale, this relationship can be seen as merely the behaviour of commuters interacting with the efficiency of technology. That is to say that an efficient commuter culture - waiting for passengers to disembark first, lining up at train doors, etc - is only actually effective when trains are similarly efficient at arriving on time and not breaking down.

On a more micro scale, however, this relationship can be examined in even more detail. For example, efficiency is enabled in large part due to not just the markings on the platform that inform people where to line up, but also the fact that the trains consistently

align with these markings, and that passengers always obey the markings themselves. It is an interaction between technology - the consistent alignment of train cars - culture - the fact people follow the ground signage - and urban design - the existence of this signage in the first place. If the doors did not so consistently align with the platform markings, then people would have to move to reach the doors, the lines would no longer be ordered, some confusion would ensue, and boarding delays would inevitably occur. If the doors rarely ever aligned with the platform markings, then passengers would probably stop following the signage altogether - there is no point following signage that does not actually enable efficient outcomes for oneself or the collective commuter body. In the reverse, it would not matter if trains consistently aligned with platform signage if the commuter body does not follow the signage in the first place. Hence, the efficient boarding procedure requires full participation from commuters, and full - or significant - consistency from technology.

Another example of this bidirectional relationship is the way that very high-interval train schedules inform commuter behaviour. A common difficulty that train systems face around the world when boarding is that people try to force themselves onto trains that literally cannot accomodate them, holding open doors, all in an effort to get to their destination on time. Commuters cannot risk missing this train and then inevitably being late. The efficient train technology in Tokyo disrupts this inefficient behaviour. Because trains arrive every 2-3 minutes in peak-hour, if a commuter misses one train, it is highly unlikely that they will be late to whatever event they are trying to get to. Similarly, because people are lined up, there is no dispute as to who is next to board a train, and if a passenger misses one train, they know that they will be first or near-first to board the next one as the line order is maintained. Hence, as a result of high-interval trains, people become less inclined to hold open doors because they know that there will be another train coming in a couple of minutes.

Fewer disruptions occur when commuters behave in this way, and the commuter behaviour itself is only really enabled by efficient technology in the first place.

Indeed, whilst this relationship may be impressively efficient, it is not always pleasant nor kind to commuters. As Fisch explores in his text *An Anthropology of the Machine*, the concept of 'finessing the interval' relies on a brutal obedience from commuters to enable near-impossible efficiency at the expense of comfort, pleasantness and satisfaction. What ultimately ensues is a "collective labor of human and machine" (Fisch, 76), an efficiency that depends on both advanced train systems, and ruthless participation from the commuter body. Whilst efficiency may ensue - and indeed near-impossible efficiency in the view of Fisch - it is one that exploits the experience of the commuter that reduces their experience to merely playing a role in the operation of the vaster technological system. Technology and culture collide, and what results is a collective machine that ultimately dictates this experience.

Questions of spatial anthropology

1- Thee analysis of spatial experience

To begin an analysis of the spatial anthropology and experience of the Tokyo train system, it is first important to understand how best to analyse spatial experience, taking into account cultural and exterior influences. Edward T Hall, in his well-known book *The Hidden Dimension,* sets out a way of understanding the experience of space as a human subject. He first of all posits that a number of sense receptors create our perception of space: distance receptors - our eyes, ears and nose - and immediate receptors - touch and sensations from skin. Whilst these physiological indicators of space perception are identical no matter what culture you originate from - your body still perceives touch and smell and sight in the same way anatomically - Hall posits that the way we perceive these on a conscious level varies from culture to culture. (Hall, 40)

For example, Hall points out the difference between the layout of Japanese and Western gardens and rooms as demonstrative of this variation between the way that cultures perceive space. Ultimately, Hall comes to define notions of four 'types' of distances as a framework for understanding spatial perception: intimate, personal, social, and public. The interpretation of these distances varies between cultures - "what was intimate in one culture might be personal or even public in another" (Hall, 121).

Hence, taking this analysis and applying it to the experience within trains and station platforms, we can come to a clearer understanding of how Japanese transit systems are perceived by their users.

2- Within trains

Japanese trains are often noted globally not only for their efficiency, but their almost incomprehensible levels of crowding. In the past, 'pushers' have been employed to squeeze commuters onto trains during rush hour; whilst levels of crowding may have diminished somewhat, it is still easy to experience just how crowded trains can become by watching commuters step onto trains that seem entirely full, yet impossibly accommodating of this new addition. Yet crowding persists on Tokyo's train systems, and there is little done to accomodate or make any changes to this level of crowding - it is crowding that has been consistent and continuous over time, obviously partially caused by the fact that there is literally no other way to accomodate such high numbers of passengers.

However, Hall makes an important point about how this 'crowding' - or what a Westerner may perceive as uncomfortable crowding - may be perceived differently than a Tokyoite or a Japanese person.

> "To the Westerner of a non-contact group, 'crowding' is a word with distasteful connotations. The Japanese I have known prefer crowding, at least in certain situations." (Hall, 142)

This point is important to keep in mind when considering the experience of riding on Tokyo's trains - whilst they may seem incredibly overcrowded - and therefore uncomfortable - to a Western traveller, the same may not be true for a Japanese passenger, due to these differences in perception of space. Hall's analysis still has some elements of cultural romanticisation and is not entirely objective, however. As such, it is difficult to take his analysis at face value. What is nevertheless clear, regardless of cultural interpretation, is that Tokyo's peak hour trains are by all means filled to capacity, and often over-capacity.

If we for a moment put aside the differences in cultural understandings of the discomforts crowding, and take a more universal approach to attempt to comprehend how crowding is so tolerated, some insights can be made. In his text *Rush Hour: How 500 million commuters survive the daily journey to work*, Iain Gately outlines his own concepts for how this crowding can be tolerated by commuters: "If the theory of proxemics [Hall's concepts of distance] is valid, then how do we tolerate its violation, especially when we do so voluntarily when we commute?" (Gately, 172) Gately outlines two theories in response to this question.

Firstly, he posits that the natural 'freeze, fight or flight' response is invoked when travelling on a crowded train. When we travel in an over-crowded train, we are "paralyzed with fear, and this is why [we] avoid eye contact and stare instead at each other's feet" (Gately, 173). The second theory is the "theory of objectification" in tandem with "collective resilience". That is to say that we view each other as inanimate objects, rather than people whose personal space we are invading, whilst simultaneously feeling a shared sense of community in the crowding that ensues,. The notion of a shared sense of community

is one, to Gately, most clearly revealed in times of strife. For example, during the London suicide bombings of 2005, the "tragedy had made [the survivors of the bombings] feel far more connected than usual" (174), exposing a sense of community that exists whenever people commute. Hence, to Gately, "a combination of objectification and collective resilience" (175) helps to explain how we tolerate overcrowding.

I would posit, however, that there is an additional layer to both Hall and Gately's analyses that can help to create an understanding of the experience on Tokyo's trains. This experience can be understood as the faux privacy of public space: the attempts made by commuters to try to create elements of privacy even when crammed into an uncomfortable, public space. On a first level, just as Gately observes in his work, eye contact between commuters is rarely made, and at all times avoided. Commuters, not just in Tokyo but across the world, will look at their phones, listen to music, read a book, all just to be as isolated as possible in a cramped environment. Notable in Tokyo, however, were passengers that would literally always close their eyes when on trains, avoiding visual contact - closing one of their 'distance receptors' (Hall) - and attempting to isolate themselves.

On a second level, commuters who are reading will more often than not put a cover on their books in order to hide what they are reading from the prying eyes of other passengers. Whilst this may just be a reflection of Japanese culture in general, it is particularly noticeable on a train, and plays into an understanding of the Tokyo spatial experience on trains as one that encourages this 'faux' privacy as much as possible.

Finally, on a third level, the silence of Tokyo's trains is incredibly jarring. Entering a train during peak hour, you are almost always greeted with intense, utter silence, much unlike what you are greeted to on other cities' transit systems. You cannot hear the music of other commuters through their headphones as you can in other cities - in fact there are multiple

adverts advising against this behaviour - and all you can hear is the whir of the train engine and air conditioning, and the friction of plastic handles against metal poles.

> "No words are exchanged among commuters during the process, and no words will be exchanged for the entire ride, leaving the train car in an absolute silence punctuated only by regular service announcements and reminders from the conductor." (Fisch, 18)

On all these levels, Tokyo commuters seem to attempt to relieve the invasion of a number of these 'receptors' that Hall coins - their visual and auditory receptors in particular, combined with an attempt to achieve personal privacy. The commuter is immersed in their own small world when riding a Tokyo train, and while this may not make it bearable for a Western commuter in many cases, it seems to make it bearable for the Tokyo commuter, and at the very least *more* bearable.

However, Fisch claims that this experience, whilst perhaps more bearable than other cities, is by no means a pleasant one for commuters. In the same vein, it is not a choice that commuters make, but a ncessary part of life in the urban environment. "'There is no choice': one hears this phrase often from commuters in Tokyo regarding the packed morning commuter train" (Fisch, 29). It is a necessity that commuters must bear, rather than a pleasant experience that any commuter may enjoy.

3 - Within stations

Within the physical spaces of stations themselves, this culture of commuting leads to an interesting phenomenon that can be described as the 'invisible walls' within stations. Whilst the physical structure of stations - the walls, the platforms, the stairs - are constructions that are static, stations themselves are spaces that are constantly in flux, ever-

shifting and never permanent. This is all due to the movement of people through a station, whether through the narrow connecting tunnels between platforms, or wide open concourses navigating between train lines. These ‘walls’ are not physical barriers in the same sense that railing, actual walls, or ticket gates are. Rather, these walls are caused by the common, unified mass influx of people as they move through stations at rapid speed.

Whilst sometimes hard to capture, the ‘walls’ are somewhat obvious here, with two distinct and opposing flows of people.

This barrier is in fact both physical and mental. On a physical level it is difficult to literally move through a group of people all moving in unison in the same direction. Doing so leads to bumps, unwanted contact, and discomfort. On this level, a ‘wall’ is formed, and the navigation through the flow of people is discouraged, for want of avoiding uncomfortable and unnecessary contact. Whilst it may be physically possible to move through this ‘wall’, it

is certainly not mentally palatable. In this regard, the notion of a mental ‘wall’ can be understood. As commuters, we are often mentally impaired from moving through a wall of moving people - it is difficult to mentally force oneself into causing the disruption, and dealing with the discomfort that ensues. Hence, barriers are formed through the mass movement of people, and the physical and mental perception of other commuters.

Whilst standing and observing commuters in Shinjuku station, the shape-shifting nature of these walls became increasingly obvious, as did the way in which Shinjuku station and Tokyo’s commuter experience works to maximise the efficiency of movement.While not actually transferring between trains or exiting, but instead attempting to observe the movement of other people, it became increasingly difficult to stand in one place, or move in a direction that I found useful for my observations. Instead, I found myself moving with the flow and flux of the station and its commuters, being pushed around by the ever-evolving walls, walls that were constructed and dismantled by the changes in the presence of people en masse.

In confined spaces, these barriers are even more obvious as the flows are squashed together.

This experience speaks clearly to the notion that stations are places with these ‘invisible walls’, not just the brick and mortar physical barriers that exist. These walls shift and change as need be, directing flows of people through the station, and this method is particularly effective in Tokyo.

Moving into a station in Tokyo for the first time, it is almost like observing a ‘hive’ of people moving to the gates and to the train. There are some stragglers, some commuters that try to cut in line, but most stick to the mass huddle of people moving through a station. As an unfamiliar traveller, you join the hive, grouped together moving in what seems to be the most efficient way to move through the station. For a normal commuter, this experience is already habit, and is part of the established commuter culture.

Where Tokyo's stations succeed is in the impressively organised and universally-adopted commitment of passengers to these flows; the more universal the movement, the harder it is to act in opposition to this movement. The more people that join the hive and create the 'invisible wall', the firmer these barriers become. Indeed, these walls and these flows of people become so engrained that to cause alteration to such movement requires strict intervention. When an escalator was operating in the opposite direction than usual, three station staff members were employed to redirect commuter flow through the Shinjuku station tunnels, along with temporary railing. The walls had to be disrupted by a firmer barrier - a literal physical barrier in the railing, and a directive barrier through the station staff. This experience reveals just how rigid these passenger flows become, particularly in Tokyo.

As explored in this paper, Tokyo's train system is an efficient beast that relies on the participation of commuters. Commuter culture is core to any successful mass transit system, and this necessity only becomes more obvious once the distraction of technological failure dissipates. Whilst efficiency may be the primary goal not only of train operators, but also of commuters wanting to get from place to place punctually, that is not to say that efficiency necessarily equates to pleasantness. In fact, this efficiency often comes at the expense of commuters, reducing them to mere cogs in the machine of efficient transit - a necessary frustration to which commuters must ultimately consent or bear the consequence of not being able to travel.

Commuter culture is formed through signage and station design, and efficiency is enabled through this culture playing effectively in tandem with consistent technology. What is reached in the end is a high-stakes system that succeeds when these elements are in sync, an outcome that is fairly common for Tokyo itself. What is nevertheless clear is that if cities

are looking to improve their commuter transit systems, whilst technology is a necessary improvement that must be made, the overall system as a whole must not be overlooked, particularly the ways in which commuter culture can be manufactured and improved. Tokyo succeeds in the near-impossible because these elements exist in a consistent unison - this unison is what cities around the world should aim for.

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