

The City Delimited

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

We were building cities as we moved across the continent, connecting a network of moments, of arrivals and departures, of cafés and unfamiliar beds, of stairs upwards and down, of ghostly night-time piazzas and vibrant markets bathed in sunlight, of rests in the shade and exhilaration under cloudless skies. A part of our world was experienced firsthand, the other composed of fleeting glimpses of possibilities and flights of the imagination.

This thesis operates on the premise that without movement there is no identity—without an oscillation in or transition through space, there is no way to distinguish one moment from the next. Even the slightest motion, a wisp of smoke drifting through the air, a ripple passing across the surface of the water, the flicker of a distant light, the faint tremor in a hand, gives us a reference against which we can measure where we are, what has come, and what might yet occur. And so we project ourselves into the unknown distance and through our movement, string together people, places, and events, mapping out a spatial identity bound by time. We cobble together cities from routes and moments, each space we pass through enfolded in and inflecting on the next; our communal movement imprints us with an identity, wearing the trace of its motion into our very being.

Positioning itself as an investigation into the affective capacity of transport, this thesis argues that the potential of a city is both composed and

revealed through its systems of movement, contending that the sensorial and expressive qualities of a city's transit govern how its citizens perceive and access the scope of experiences available to them. Essays on movement and identity, the limits of the city, immobility, adaptation, and eccentricities, move in parallel with meditations on departures, arrivals, and the time of transit toward a mandate for an amplification of motion and energy.

The thesis traces a route from Ontario through London, Rome, and northern Europe before returning to Toronto only to founder in the region's gridlock. To free the city's constricted potential, a new passenger rail line running from Pearson Airport, through Toronto on the Canadian Pacific Rail corridor north of Dupont Road, to the site of Pickering's future international airport is proposed.

The key interchange of the new line, Lake Iroquois Station, is developed in detail, feeding on an intense overlap of historic and contemporary infrastructures. Located just south of the historic First Nations trading trail of Davenport Road at Dupont and Spadina, the station gathers the primary midtown electrical corridor, extensions of the Bathurst and Spadina streetcar lines, the existing University/Spadina subway, and expansions of the city's cycling network, knotting them together with regional passenger rail in order to transport the city and its imagination.

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Dedication

To my father, whose ingenuity has shown me there are no dead ends, just a different means of getting there.

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Before the real city could be seen it had to be imagined, the way
rumours and tall tales were a kind of charting.

– Michael Ondaatje, *In the Skin of a Lion*



Prologue

The network of railways developed over the past 150 years, linking the primary industrial and urban centres of Canada, provided the initial, large-scale framework for the growth and concentration of density and economy across the country. Cities and industry attached themselves to the spreading threads, accumulating compactly to ensure direct access to the thin, linear infrastructure. But with the subsequent introduction of automotive and air transport and their associated infrastructures, the magnetism of the rail networks weakened. Competition in the transport of both goods and passengers over short to medium distances against the car/truck and over medium to long distances against the truck/plane relegated the railways to a secondary, or even tertiary, system. The city spread as the car spread, aggregating now around highways and airports, and as interactions with railway transport declined, its prevalence in the consciousness of the Canadian public also diminished.

However, the growing global pressures of urbanisation and ecology have forced a renewed focus on mobility in Ontario. Regional transit initiatives have come to the fore in both government-based planning policies and in public discourse. In contrast to the extraordinary space and energy consumption associated with automobile and air transport networks, rail travel offers an appealing alternative. Having languished in a comparatively rudimentary state for decades, the commuter rail infrastructure of the Greater Toronto Area is still pliable. The forms and interfaces proposed in the locations of new stations, the avenues of rail connecting them, and their overlap with existing modes and systems of transportation hold tremendous potential. Their implementation and evolution will control the movement of the GTA's population and the shape of its public realm for years to come. As such, a re-examination of the imaginative potentials inherent in rail transit and its associated infrastructure is crucial.

fig. 1. Existing rail corridors in Central Ontario

The existing passenger and freight rail systems in Central Ontario are the expression of a history of the continuous tracing, erasing, and retracing of routes of travel. Each modification in the network is the result of an envisioned opportunity for improvement in speed, capacity, and quality, responding to advances in rail technology, increases or decreases in projected demand and capacity, spatial constraints, frequented or desired destinations, etc. With each focused improvement (addressing track repair, line extensions, bridge or tunnel construction, etc.) comes the opportunity to address issues of public space, aesthetics, and ecology, often considered tangential or, worse, inconsequential in relation to the prime motivations of efficiency, economy, and engineering. As the pressure of density forces cities and citizens into more frequent contact with all forms of infrastructure, the social, emotional, and spatial impact of the structures underlying and supporting cities can no longer be an afterthought or considered as a side-effect. The potential benefits and hazards for the public realm embedded in the reformation of any widespread network must be addressed pre-emptively.

The commuter rail system of the GTA contains the possibility of making an exemplary contribution to Ontario's public realm. Held in public trust and confronting all of the public in some manner on a daily basis, the manifestations of transportation infrastructure provide responsive feedback, making apparent the future aspirations and current predispositions of the citizens they are built for; they act as both a driving force behind and also resultant expression of the ambitions of the public itself.

Displaying the public's predilection for particular modes of travel, the automobile and air networks have enjoyed near constant reinvestment and reinvigoration, evidenced by the yearly slate of road construction projects and the decades long Terminal 1 project at Lester B. Pearson International Airport.¹ In contrast, the languid state of the commuter rail system is evidence of a long-standing, general indifference.² Of late, however, a renewal of large scale investment has been made in Ontario's rail networks with expansions out from and along most GO Train service routes and an in-progress renewal of Toronto's Union Station. The Toronto Transit

1 Government of Ontario, Metrolinx., 5, 6. The *Big Move* report further discusses Ontario's dependence on automobiles and the continued investment in its supporting infrastructure, citing these factors as a primary cause of diminished economic growth and decreased quality of life. See also Hume, "Toronto public transit suffers while car is king."

2 See Wells, Jennifer. 'Ontario's Northlander train makes its final run.' The divestment of the Ontario Northland Transportation Commission by the Government of Ontario and the associated elimination of the Ontario Northland service can be seen as emblematic of a province still limited in its appreciation for forms of transportation alternative to the automobile.

Commission has also made commitments (though wavering on a near monthly basis in scope and funding) to expand its network and service.³ The question remains, however, whether these investments will be carefully spent to achieve durability while making significant contributions to the public realm and re-invigorating a sense of civic aspiration or merely used to meet short-term service needs without exceeding them.

Beyond the short-sighted economic concerns, infrastructural projects in the increasingly urbanised region of Central Ontario must confront the escalating complexity and delicacy of the urban fabric with which they intersect. The contrast between the concerns of the large scale network and the small scale neighbourhood requires sensitive mediation. Though a new line of infrastructure may serve a singular purpose, in the city, it traverses multiple and varied conditions, each of which imposes its own constraints and opportunities. Perhaps the most overlooked opportunity for transportation infrastructure is at the personal scale of the passive interaction. While each segment of a network must contend with the demanding, active objectives (e.g. cost, span, traffic/capacity) required to be met for its base function, it is the tactile, aesthetic, personally felt conditions confronting the passive participant (the pedestrian, cyclist, driver, or passenger) which have the most profound influence on perception. The public whose route only incidentally intersects a given piece of infrastructure will be affected by the haptic experience rather than by any objectively definable, esoteric performance criteria. The repudiated success of an infrastructural project may be measured by its large scale effectiveness, but it is at the scale of direct interaction and experience on which much of the appreciation for any public work hinges; these personal and intimate moments are where the emotion of the city is formed and public imagination takes flight.

—

The renewed interest and investment in mobility and public transportation in Ontario presents a tremendous opportunity to reevalu-

3 A limited survey of news articles drawn from *The Toronto Star* and *The Globe and Mail* since November 2011 demonstrating the contentiousness of transit issues can be found in the appendices. Edward J. Levy's webbook, *Rapid Transit in Toronto* <<http://levyrapidtransit.ca/>>, also provides an insightful view into the history of Toronto's near perpetual indecisiveness on issues of transit.

ate how Ontario envisions itself in motion. Expanded, overlapping, and improved transit across the province holds the possibility of connecting Ontarians not only with one another but with a vastly broader range of experiences. Growing variety in modes of transit also introduces new means of experiencing the time and space between destinations, shifting how the public interacts with the urban form and revealing previously hidden facets of the region. This thesis thus positions itself as an investigation into the affectual capacity of transport itself, proposing that the potential of the city is both exposed and accessed through the sensorial and expressive qualities of the frameworks for movement permeating our built environment.

An approach to transport and its infrastructure is developed through five essays and an intertwined narrative. The essays trace an arc of the relations of movement, structure, and desire, while the narrative moves in parallel, developing the themes of the essays *in transit* from Ontario to London, through Rome and Northern Europe, and back again to Toronto. The motion of the narrative is incorporated both to function as a tangible, concrete relation of some of the more abstract ideas presented in the essays as well as to provide a platform for the integration of the design proposal. The thesis meanders a winding path, encompassing aspects of the author's personal experience intermixed with fictional projections and design, alongside the research and speculation of the essays.

Here, then, is a sort of cursory roadmap to the thesis, describing the primary routes and waypoints so that the reader can prepare for the journey:

The thesis begins by setting out the key proposition that there is an intrinsic relation between movement and memory, motion and emotion. The first essay, *Identity in Motion*, traces the flux of identity in cities and individuals. Paired with this investigation, *In Transit 1* begins the narrative by moving through London, England, navigating the city and new means of motion before departing for Rome.

The second essay, *The Limits of the City*, extrapolates on the experience of motion in the city, drawing on London as a case study

to convey how the potentials (or limits) of the city are revealed by its infrastructure both from within, as a facilitator for accessing experience, and from without, at the farthest points where the marks of its influence can be felt. The third essay, *Apathy and Im-mobility*, meanwhile, examines the breakdown of this relationship, portraying the disastrous results of a disconnection between a city's structures and its desires.

In Transit 2 brings these themes into relief, resuming the narrative account a few years later during a second experience in Rome where the constrictions of the city wind tightly before release is found in the intensity of speed and projection of a journey through northern Europe. Memories of the motion are built in compilations of snapshots from trains, both in photos and text, which reveal colour, emotion, and landmarks in the blur of movement. The exhilaration is short-lived, however, as an even deeper stagnation is confronted upon arrival in central Ontario, followed by an almost all-too predictable disaster.

The fourth essay, *Adaptation*, explores strategies for realigning civic infrastructure with civic ambition, spurring mobility through adaptation. The section returns to the relations of infrastructure, desire, and the potential of the city previously discussed in *The Limits of the City*.

In Transit 3 brings the narrative back, again several years later, by embarking on an allegorical tour of Toronto, drawing the core of the thesis into transport through the city, arriving at the proposed *Lake Iroquois Station* and departing again in *In Transit 4* towards the potentials of the city and motion beyond.

The fifth and concluding essay, *Eccentricities*, recovers the theme of movement and identity, exposing the role of unpredictability which contests the seeming determinism of transportation infrastructure.

Identity In Motion

The city, however, does not tell its past, but contains it like the lines of a hand, written in the corners of the streets, the gratings of the windows, the banisters of the steps, the antennae of the lightning rods, the poles of the flags, every segment marked in turn with scratches, indentations, scrolls.

– Italo Calvino, *Invisible Cities*

What moves as a body, returns as the movement of thought.

– Brian Massumi, *Semblance and Event*

A record of movement, drawn across a surface, carved into matter, the trace is an imprint of a gesture through time and space. The scuff of a boot on polished marble, the ink of a brush pulled across paper, a spreading rust-coloured stain trailing down a stone wall, the steel guardrail crumpled in an accident, a gorge cut by the slow action of a stream of water; through traces our environments retain the memory of past motion and reveal the actions that have shaped their present condition. Myriad forces acting in confluence impose a unique identity on each instant and instance, shaping character, form, texture, resonance, resilience. And, reciprocally, through sometimes subtle affects, traces of the aggregated actions can be read and begin to shape action themselves.

The fabric of our cities acts as a register of their evolving use, restructured and remodelled as populations, ideals, and technologies change. Aldo Rossi, in the third chapter of *Architecture of the City*, emphasizes the singularity and permanence of his notion of locus (the underlying and ephemeral spirit which gives conceptual shape to the built environment) but then goes on to describe the city through examples such as the Imperial Fori of Rome as a constantly mutating thing, “seen as a material artefact, a man-

made object built over time and retaining traces of time, even if in a discontinuous way.”⁴ The urban form flexes to accommodate the movement of the many agencies acting on it. Though enduring, the city and even the many individual loci that compose it are hardly permanent. Instead they evolve in reaction to both the effects of natural forces and the constantly changing habits and predispositions of their temperamental inhabitants. At any given moment, the city appears stable in contrast to the greater speed of the processes which utilise it, but it too is in flux.

Even the most iconic aspects which define a city are subject to not only the ravages of weathering but planned reorganisation and spontaneous vandalism, malicious or benign. On a nearly daily basis, the city is reconstituted and reappropriated as its occupants shuffle and reorganise both themselves and the urban fabric, cleaning, trimming, and reclaiming its surfaces, recovering, to a certain extent, the image of the city they retain in their memory from the previous day. The advance of time, evidenced in the accumulation of dirt, is held at bay with a broom stick. The bustle of a day’s work is scrubbed from the sidewalks, the stains of the night’s revelries put in the wash. Gradually this maintenance becomes more pronounced, even aggressive. Entire streets, as they wear out in ruts, cracking and heaving, are torn apart and resurfaced; the rusting, calcifying bowels of the sewer systems are ripped out and replaced as leaks spring or pipes are choked; the slowly dying trees lining boulevards, limbs stiff and barren from years of contesting the sun and smog, are felled and replanted. At the scale of the individual building, simpler operations testify to the effort to deny the action of time: brick walls are re-pointed, new layers of stucco are applied, fresh paint is spread on the wood trim of windows. For the most part, this work is an act of restoration, an attempt to revive the characteristic qualities which, to the collective understanding of its inhabitants, define the city’s identity. Effacing any hint that time has advanced or the city may be changing, they hold on however tenuously to a past, often glorified structuring of space, even while their lives are in constant motion around and through it.

But when this vigilance slips, when the city stops attempting to

revivify its constructed image, traces remain and begin to spread. Subtle evidence of internal tension shift the conception of place; in the inner city, the growth of claimed territory is evidenced in the dispersion of gang graffiti tags, the penetration into and contestation of place ingrained in the overlapping layers of flaring neon names and acrid scrawling symbols. The marks are a first step towards reappropriation. Similarly, but on an historical scale, incisions into and accumulation around what were once unassailable edifices testifying to the pride of an empire by the construction of humble residences, occurred throughout the Roman Forum during the medieval era. The almost humble nature of residential occupation belied a more dramatic shift in ideals, evidence of a population no longer concerned with outward movement and the expression of power but instead requiring internal focus and the localisation of security.

Over time, traces accumulated on the fabric of the city begin to both effect and affect action. Past movements provide prescribed paths for the present; the trickle of a stream of water carrying away sediment erodes, in its course, a stream bed through which a deluge then finds its path. Enduring routes or trajectories are made concrete through their consistent use, courses of travel marked out through systems of painted lines guide drivers, cyclists, or pedestrians to their destinations along historic or imposed avenues, influencing movement with guarantees of safe and easy conduct. The interaction of traced memories and new movements is reciprocal; as change is processed, it is also instigated. Maurice Halbwachs in his book, *The Collective Memory*, discusses the mutual influence observed between a collectively organised group and the space which it occupies:

The group not only transforms the space into which it has been inserted, but also yields and adapts to its physical surroundings. It becomes enclosed within the framework it has built. The group's image of its external milieu and its stable relationships with this environment becomes paramount in the idea it forms of itself, permeating every el-

fig. 2. Untitled (*Zigzag Crowd*),
Alexey Titarenko, 1994



5 Halbwichs, 130

6 A passage in Giuliana Bruno's *Atlas of Emotion*, traces a similar thread: "[A]rchitecture is built as it is constantly negotiated by emotions, traversed by the histories of its inhabitants and its transient dwellers. Seen in this way, architecture reveals urban ties: the product of transactions, it bears the traces of urban emotion and its fictional scriptings. A relation is established between places and events that forms and transforms the narrative of a city: the city itself becomes imaged as narrative as sites are transformed by the sequence of movements of its traveller-dwellers." 66

ement of its consciousness, moderating and governing its evolution.⁵

The flux of the environment and the flux of the forces and users acting on it inflect constantly on one another, demanding concessions and continual adaptation. Just as a group's habits and rituals make their mark on constructed space and become concrete, the existing urban forms and topographies shape how the group moves or collects and disperses.⁶

The adaptation of mannerisms or identification occurs not only in relation to interactions with the localised and (semi-) permanent forms of the built environment but also in relation to the experience of the more volatile change of location itself over time – i.e. velocity and acceleration. This experience is not simply one of a visceral shift in inertia—a body or bodies reacting to acceleration or to one another, deflecting or combining to generate new speeds—but again of a reciprocal transformation of the identity of the individual or group involved. The taxicab can serve as an example: upon enter-



*fig. 3. Untitled (Crowd 1),
Alexey Titarenko, 1992*

ing the vehicle, the former ‘pedestrian’ becomes a ‘passenger’, made to sit in the backseat and required to sacrifice certain freedoms – i.e. money – in exchange for the privilege of increased speed, in proportion to the distance traveled. At the same time, the formerly aimless motion of the cab and driver is subjected to the will of the passenger, obligated to venture wherever he or she requests. The pedestrian acquires a new means of motion while the taxi acquires a ‘fare’. In each, the imprint of the other can be read.

For Alon Confino, Professor of History at the University of Virginia, this evidence of the identity of a traveller in their means and destination of travel is especially illuminating. In circumstances where the traveller may be unable or unwilling to acknowledge a personal predilection or opinion, the traces of their journey, in choice of waypoints, selection of postcards, timing of travel, discretion in company kept, etc. speak strongly of the conception of self they carry with them and allow for speculation on their motivations.⁷ But where the journey is more restricted, preventing the possibility to meander, the identity of individuals and even of groups

7 Confino, 112-15



fig. 4. Untitled (*Crowd 2*),
Alexey Titarenko, 1993

becomes obscured and is less effective at exerting its own force on the system in which it participates. The flight path of an airplane with a predetermined point of departure and destination will reveal little more than wind speed and atmosphere and say next to nothing of its passengers, while the common culture of commuter trains and highways will obscure individual predisposition in a multitude of possible motivations for any particular journey. Instead, as the speed and direction of travel become necessarily more regulated for reasons of timing and efficiency or safety and security, the experience of movement increasingly governs the expression of identity, controlling where, when, and how its users behave.

In his essay, “Sense of Movement,” Arnold Reijndorp, drawing on Marc Augé’s commentary on the Paris subway, writes of the codes, habits, and regulations to which the users of public transit become accustomed.⁸ Through use, the passengers embody a knowledge of and sympathy with the system, its maps and motion imprinted on their movement. Regular commuters are able to recognise the most banal differences between stations that appear to

8 Reijndorp, 88

the uninitiated as indistinguishable—the missed stop is rare, even when riders cannot resist a nap on the route home. They are able to navigate the winding tunnels leading to the exact train doors which they know will open onto the exit at their destination, taking them as quickly to their desired street as possible—floods of commuters will step out from the same carriage at their home station while only a trickle of confused visitors will descend from the car furthest from the exit. They find comfort in the minimal space available, assuming poses propped against poles or hanging from the straps, relying on the endurance of muscles trained to resist the unnatural strains of acceleration, deceleration, and prolonged standing. The rhythm and course of the train, streetcar, or subway fixes the pace of their passengers. The commute itself becomes a sort of muscle memory, a reflexive procedure performed without a second thought. The commute insidiously remoulds those who use it consistently, shaping their lives through a type of assimilation.

Jean Baudrillard develops this theme in his commentary on America as a concept and as a visceral experience, exploring collective travel and identity as formed on the country's ubiquitous freeways:

To the person who knows the American freeways, their signs read like a litany. 'Right lane must exit.' This 'must exit' has always struck me as a sign of destiny. . . . This is the only real society or warmth here, this collective propulsion, this compulsion . . . Why should I tear myself away to revert to an individual trajectory, a vain sense of responsibility.⁹

In utilising the framework offered by the freeway, the American traveler accedes to its laws and is subjugated to its rituals. For the time of the journey, the traveller's identity is fully shaped and limited by its bounds, a vector propelled forward by the asphalt and painted lines slipping beneath the tires of the automobile.

'Must exit': you are being sentenced. You are a player being exiled from the only – useless and glorious – form of collective existence.¹⁰

9 Baudrillard, 53

10 *ibid.*, 53-4. The remainder of the passage is equally telling: 'Through traffic merge left': they tell you everything, everything is announced. Merely reading the signs that are essential to your survival gives you an extraordinary feeling of instant lucidity, of reflex 'participation', immediate and smooth. Of a functional participation that is reflected in certain precise gestures. The lines of traffic diverging towards Venture Freeway and San Diego Freeway do not leave one another, they just separate out. At every hour of the day approximately the same number split off towards Hollywood or towards Santa Monica. Pure, statistical energy, a ritual being acted out – the regularity of the flows cancels out individual destinations. What you have here is the charm of ceremonies: you have the whole of space before you, just as ceremonies have the whole of time before them.

The experience, in contrast to the freeway's promise of incredible velocity and free movement to far off destinations, is one of intense control but a control intended, and required, to ease the strains that can arise with speed and distance. As the traveller grows accustomed to these constraints, the comparatively unrestricted space beyond the edge of the freeway or at the end of the off-ramp becomes frightening in its wildness. The essence of the freeway becomes embedded in the traveler's desire and direction.

Gradually the experience of movement extends even beyond the time of travel. Every seasoned commuter will bear traces of their preferred mode of travel with them into their personal and professional lives. The most obvious mark, carried almost universally, can be found in the presence of a multi-stamp ticket or an electronic pass tucked into the wallet or in a pocket of a purse. The possession and location of the pass is as, if not more, critical to their peace of mind as a driver's license, cell phone, perhaps even family photos. Without it, the commuter is immobilised, stranded, or subject to fine and expulsion, cast out from the commuting collective—a banishment fraught with shame and discomfort. Less obvious are the rhythmic echoes of the commute beyond the doors of the station or streetcar. The pace of the commute controls movement not only within its spatial and temporal frame but resonates throughout the commuter's entire day. Work hours and the length of days are set by the schedules of irregular departures (e.g. leaving the office at 5:20 and walking 15 minutes to ensure a seat on the 5:43 train westbound; allowing an extra half hour for unexpected delays on the bus route).¹¹ Patience is set by the minutes between departures, and meeting length measured against variable trip times. The inertia of movement carried out every morning and evening embeds itself in the very essence of the commuters, altering everything from their posture and gait to the amount of time they are willing, or able, to spend analysing and making a decision.

In the essay "Island Time," Jaigris Hodson and Phillip Vannini explore the effect of the ferry commute between Gabriola Island and the city of Nanaimo on the islanders' perception of time and of themselves. The ponderous slowness of the ferry works its way into

11 Infantry, 'Cost of Gridlock: A tale of two transit users'

each of the Gabriolans daily habits. They relate to one another and identify themselves in contrast to the inhabitants of Nanaimo and Vancouver Island through an innate adherence to what they label as *island time*. Hodson and Vannini explain, “Island time means a later time than what the universal clock says, it means being as late as the ferry is, and it means moving as slowly as the ferry does.”¹² The rhythm of the ferry figures consistently in island life. Its inflexibility requires the Gabriolans to conform to its schedule and its idiosyncrasies. The pervasiveness of the ferry’s influence is apparent in one of the authors’ personal account:

I arrive at the Nanaimo harbour side of the Gabriola ferry terminal just in time to see the ferry pull away from the dock. Normally I’d be upset with myself for missing the boat by such a narrow margin. But they changed the schedule recently, so it’s not my fault. When I used to take the ferry in high school and early college, the ferry left Nanaimo every hour on the half-hour. Not this one, anymore. Oh well, I have some shopping I should do anyway. “I could just walk across the street to the mall to get groceries,” I think to myself, “I have fifty minutes to kill.”¹³

After a short while, as a consequence of his ill-timing, he arrives late to a meeting he himself scheduled. He assesses his emotions as having been altered through contact with the ferry:

I should be upset to be arriving at the group interview later than I had hoped, but for some reason I am not. After a while waiting for people to arrive, I realize why I wasn’t upset to be late. Everyone else is late, at least 45 minutes. And nobody minds; we are on island time.¹⁴

Over and above the basic physical segregation caused by the geography of Gabriola, it is the experience of the ferry that leaves the greatest imprint on the islanders. Their conformance to the pace of the ferry is incomprehensible to visitors whose restrictions on time and movement are based on the flexibility of car travel or the speed and regularity of a train.¹⁵ Forced to adhere to an atypical

12 Hodson and Vannini, 262

13 *ibid.*, 265

14 *ibid.*, 267

15 *ibid.*, 269

framework of movement and time, the Gabriolans are socially and conceptually segregated from the mainland but fully in sync with one another. Moving in time with the ferry is not merely a habit but an integral part of their being.

We construct identity in motion, etching traces of movement into our cities and memories. These worn paths, in turn, mould our motion through them, shaping encounters and emotions. Giuliana Bruno builds the argument of her book, *Atlas of Emotion*, on this principle, “that motion, indeed, produces emotion and that, correlatively, emotion contains a movement.”¹⁶ Movement is not simply a displacement in location but a shift that affects us to the core, reorganising our perceptions in relation to our transit. Our motion through past environments and the paths we project into the future are the root and route of our being.



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In Transit 1

We approached the city from the north, the tracks bending subtly westward towards the last shrinking segment of the sun before making their full northwest swing, to penetrate the city walls and slide past the dim dusk outlines of old stones and weathered brick. Bleary yellow lights glinted on the tightening ribbons of steel pulling us forward, deeper into the dense pack of palazzos and apartment blocks. The shadow of the city closed around us, muffling the long, ringing sigh of our slowing motion. Dull snaps strummed against the windows, softly at first, but intensifying in insistent syncopation and soon matched by sudden blinding flashes. As the train dragged itself along the platform, a sudden mob of blue crashed against us, propelled by crackling explosions at the far west of the station up ahead. Hands taking up the now deafening rhythm slapped the sides of the carriages. The rush of sound accelerated as the train came to a stop, a gurgling noise, incomprehensible, thundering around us. Our own voices caught in our throats. Tripping down the steps in a break between waves and still swaying from four hours of restless travel, we clung to our lug-

gage and struggled through the next surge, warily snaking between the bursts of shouts and leers and the swinging, erratic bodies around us. We moved quickly to the head of the platform, skirting the back end of a strained line of riot shields, pushing past the shops and ticket counters and scattered travelers, until the doors of the station slid open and we burst breathless and sweating into the dark expanse of the Mediterranean night.

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It had been a ten day journey to reach Rome but the trip had been building in motion for seven months. The heat and energy of the Italian peninsula had only been a faint conception when we left Toronto in the dead of a bitter winter and, when we arrived in England, even our transport through London was mysterious. On our frenetic first day, after scrambling through the warrens of the underground to make connections from Heathrow across multiple subway lines, we exited at Waterloo. The contrast of the expansive, late morning atmosphere in the station to the previ-

fig. 5. The route of our travels

1. London; 2. Brussels; 3. Dordrecht; 4. Rotterdam; 5. Amsterdam; 6. Vienna; 7. Munich; 8. Milan; 9. Rome

ous two hours we'd spent crowded in breathless tunnels had us gasping in an attempt to absorb all the air and space that had suddenly surrounded us. But the interruption was brief and we were soon back in the subway, blindly navigating beneath the monuments and streets we had still only seen in postcards and movies.

The feeling persisted for the first month as we criss-crossed London, trying to settle ourselves. The city appeared in flashes. The hash marks at Abbey Road juxtaposed with apartment flats in Shoreditch; Trafalgar Square appeared next to Piccadilly Circus appeared next to the shops of Portobello Road; we waited in front of Buckingham Palace to watch the Trooping of the Colour and then emerged in Brick Lane to eat samosas. We were in London, seeing London, eating London, hearing London but it was a fragmentary, schizophrenic city.

As we settled into a routine, moving primarily between two points, the city remained full of voids. For all we knew, there was a desert, a wilderness between our two stations. The scope of our city narrowed to shops lining the fourteen minute walk

between our apartment and the tube and the eight minute walk between the other end and the office. Underground we learned the hunched posture of the evening commute, how to skim the edges of the platforms, where to wait to avoid the crush at the exit, how to resist the inertia of acceleration without any support. Each day our eyes would dilate in the dark only to shrink in the dim light of the grey sky that waited for us at the surface. Eventually we could feel a similar effect on our bodies, but our joints and limbs would take hours to recover.

Then somebody mentioned the buses. The next morning, instead of descending into the dark underbelly of the city again, we waited by a post at the sidewalk. The streetscape opened around us as we took our seats on the second deck. Even the spot on the sidewalk where we had been standing now had a texture and tone. The breaks in the pavement stretched in a grid to each building—the surface of the city could be measured and surveyed like a chessboard. And the act of moving itself, being carried, hurried past buildings and landscapes we had never seen, veering through the traffic, tilt-

ing precariously with every turn, was euphoric.

Over the next weeks, the fragments of London we had glimpsed in our short excursions out of the underground stretched and knitted into one another. The monuments and museums settled into a cohesive fabric of Georgian row homes, office blocks, shops, and pubs. We saw Russell Square in the round; Kings Cross, St Pancras, Euston, Marylebone, and Paddington all jutted into view in succession, broken in their series by the southern tip of Regent's Park; St. James's, Green, and Hyde Parks strung like pearls from the Thames to Kensington; Elephant & Castle hid deep in the dense pack of South London, the seeming convergence point of all the routes over the river. By the end of the month we had moved flats, convinced by the map coming to form in our minds that London was both smaller and much more cohesive than we could ever have understood underground.

The new apartment was a short walk from the office. For a time, our range of movement had shrunk to a one kilometre radius. Markets, parks, corner bars and the high street were no more than a fifteen minute walk. But, by chance, so were two

of the city's largest rail stations, Kings Cross and St Pancras, with a third, Euston, only a little further down the road. We would walk by, at first intimidated but then, later, fascinated by their sheer size. They quickly became reference points. 'Towards the stations' or 'up past St Pancras' were ingrained in our vocabulary; St Pancras' pointed, red-brick spire and Kings Cross' gaping arches were etched into our minds. Their influence grew more profound when we finally took the time to wander inside. Kings Cross secreted a gritty energy, surrounded by a mess of ad hoc structures and filled with glowering light seeping through the unwashed glass of its vaults.

St Pancras, on the other hand, pulsed. As we were passing by one day, we felt the urge to slip through one of the arches off the street and meander down a hallway. An old stone staircase rose through a passage on our right towards a softly growing light. At the top of the stairs (though the run was short) we could barely catch our breath—Barlow's train shed opened out in front of us like the barrel of a cannon. The vaulting steel and glass stretched relentlessly forward while, below,

the trains ratcheted in and shot out again in succession. Each platform attached to a different destination: Sutton, St Albans, Luton; and further: Brighton, Margate, Sheffield; and to the continent: Calais, Brussels, Paris. London had suddenly exploded in scope.

Through the spring and summer, almost every other weekend we would venture to a different station and board a train out across the English countryside. As our stay in London drew to a close, the distance to Rome contracted. The stations that reached into the city had become portals to experiences spread across vast areas. In a matter of hours Leicester, Sussex, Liverpool, or Edinburgh would become a part of life in London. An office trip stretched our thread even further as we were propelled underneath the English Channel to spend 36 hours in Antwerp. It became possible to imagine extending the same motion all the way to the Mediterranean.

We finally left London in the early hours of a late August morning. St Pancras' spire stood out against the sky, even in London's pre-dawn haze, its clock slowly winding the minutes as we walked

toward the station. A breath of air smelling of a mixture of coffee and old brick brushed against our faces as we entered the concourse. Checking our tickets, we made our way to the escalator, the smell of coffee and the heat of the air intensifying as we ascended to the platform.

Our train sat gleaming beneath the sky-blue vault of the shed, its taut contours giving the impression of tense alertness, as if it had been waiting through the night for our arrival—prone but wide-eyed and sleepless. Slipping through the coach door, we entered the dark, cool cavity of the cabin. The floor seemed to give slightly as the lithe machine accustomed itself to our weight. Luggage stowed, we sunk into our seats like compressed springs, pushing our impatience for the journey ahead deeper into our stomachs while our imaginations stretched out, past the length of Barlow's shed, to the cities lining the rails beyond. We could barely hear the engine which whirred with such fervent energy as we walked by on the way to our coach; the noise came to us now like the secrets passed between the couple in the seats behind us, unintelligible but loaded with hidden urgency.

The red brick arches outside the coach window began to slide away, imperceptibly at first, towards the centre of London, as if a giant hole had begun to open under the Thames. But the machine was impassive, resisting the overwhelming gravity of the city. Grasping the steel threads below us, the train accelerated, pulling free of the station, sprinting past neighbourhoods we had known, and, within a few minutes, spiralling out of London's orbit. The city was receding behind us, falling away to some unknown fate; the villages we raced past hurtled frantically back to its rescue.

The speed was familiar, the first leg of the route retracing our trip to Antwerp via Brussels. Then after following the meander of the Rhine and the Maas we would turn south to Vienna, Munich, Milan, and finally, to Rome, and the heat of the Mediterranean night.



The Limits of the City

Now, in the city, he was new even to himself, the past locked away. He saw his image in the glass of telephone booths. He ran his hands over the smooth pink marble pillars that reached up into the rotunda. This train station was a palace, its niches and caverns an intimate city. He could be shaved, eat a meal, or have his shoes coloured.

—Michael Ondaatje, *In the Skin of a Lion*

It could be far easier to travel from London to Rome than by rail, meandering across the continent for ten days. Up to 23 flights a day fly direct from one of London's four primary airports to Rome's Fiumicino or Ciampino, not counting charters; the Eurostar departs from St Pancras for Paris Gare du Nord 17 times on a regular workday, arriving in around two and a half hours or less with connections to Rome via Milan or direct overnight. Ferries at Dover, Harwich, Poole, Portsmouth, and others which can be accessed by car in about one and a half to two hours from the city make sailings up to 41 times a day for the continent. The remainder of the road trip connecting from Calais, Hoek van Holland, Cherbourg, Le Havre, St Malo, can be as direct or indirect as one might prefer but could be made in as little as 14.5 hours. For the more athletic, cycling routes, not counting the distance covered by the ferry, are just over half the length of a standard *Tour de France* (around 1750 km or two weeks for a experienced cyclist, saying nothing of the alps of course!). Finally, walking the distance is a rather absurd proposition in this age but, for the truly leisurely, could be completed in two months at six hours a day. But these itineraries speak of only one of thousands of other global experiences accessible from London by plane, train, automobile, and more.¹⁷ The breadth of potential on offer in or through London is staggering. London's banks, industries, media, etc. draw on resources from practically ev-

fig. 6. From London to Rome

The multitude of transportation options available create an intimate relationship between London and almost every city on the globe. Shown here, only the most direct of the myriad transport options between London and Rome

17 Estimates of departure frequencies obtained by scans of Heathrow, Stansted, Gatwick, and Luton's websites, along with Eurostar timetables, and directferries.co.uk on 30 April 2013; travel times and distances were gathered through google's mapping services.

ery point on the globe and, as evidenced by the ever growing spread of the English language, are reciprocally penetrative. This extensive reach is implicitly reliant on the long and steady development of its infrastructure.

18 Taylor, P.J. *Global and World Cities Research Network*

Today London ranks, with New York, as the most globally connected city in the world¹⁸ but when it was founded by the Romans in the first century there was little to distinguish it from the hundreds of other encampments in Britain and across the continent than the muddy River Thames meandering along its southern boundary. London's foundation was likely laid in the customary, Roman manner fixing the site of the city in relationship to both its physical context and to the Roman conception of the ordering of the cosmos, aligning the city's structure with the path of the sun, traced by the *decumanus*, the axis around which the sun revolves, the *cardo*, and demarcating the purview of the civic body in the sacred boundary of the *pomoerium*.¹⁹ This cosmic regulation fixed the framework that governed how the camp, and later the city, would grow and operate, distinguishing it from the erratic whims of the natural world. London, as determined by its street grid and orientation, would be a *Roman* city.

19 Rykwert, 45-9, 129-35. See also Cooley, Charles H., 112.

Though the exact locations of the Roman installations are not precisely distinguishable, their influence has reverberated as the city has grown. The crossing of the *cardo* and the *decumanus* inherently centralised urban activity,²⁰ focusing ritual and interaction on their intersection. In direct relationship to this crossing was most probably the *mundus*, which Joseph Rykwert describes in *The Idea of a Town* as the "passage to the underworld and the spring of fertility, and therefore the source of the town's existence, its matrix."²¹ It was *from* this point that the city extended, that the city was conceived to have originated, and *to* this point that the citizens brought their regular offerings to the continued prosperity of their city. The *pomoerium*, meanwhile, functioned as the delimitation of the city proper. Originally marked in the foundation ritual by a furrow ploughed around the city extents, this tract of land developed into the defense walls, protecting the inhabitants both physically and metaphysically, defining the city's jurisdiction in contrast to, and

20 An educated guess would situate this crossing near the Monument to the Great Fire at Cannon Street and Gracechurch Street which would have led to the Roman bridge across the Thames.

21 *ibid.*, 59, 127

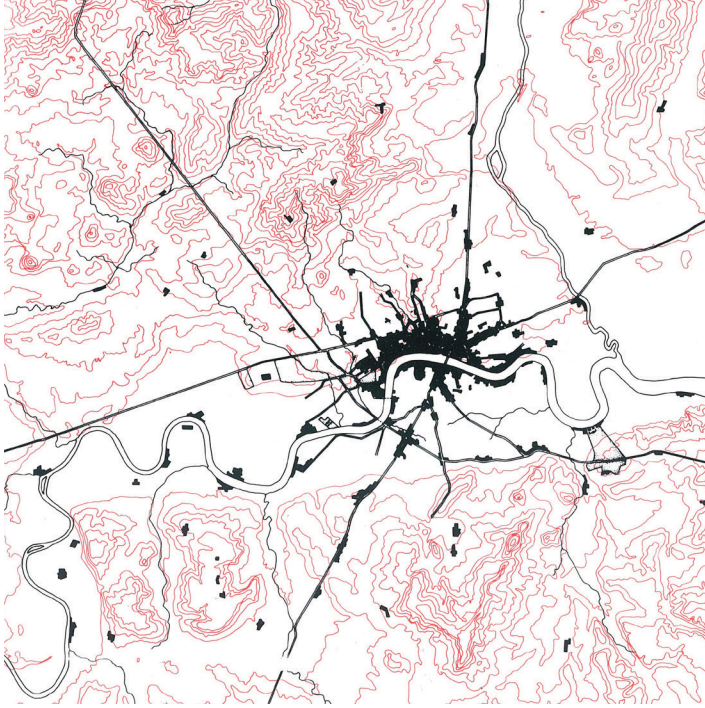


fig. 7. London - 17th Century

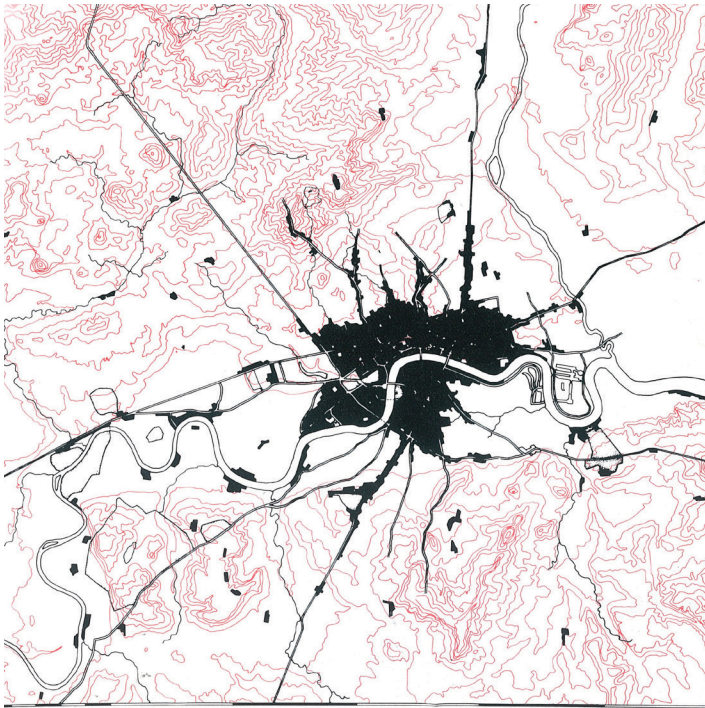


fig. 8. London - 18th Century

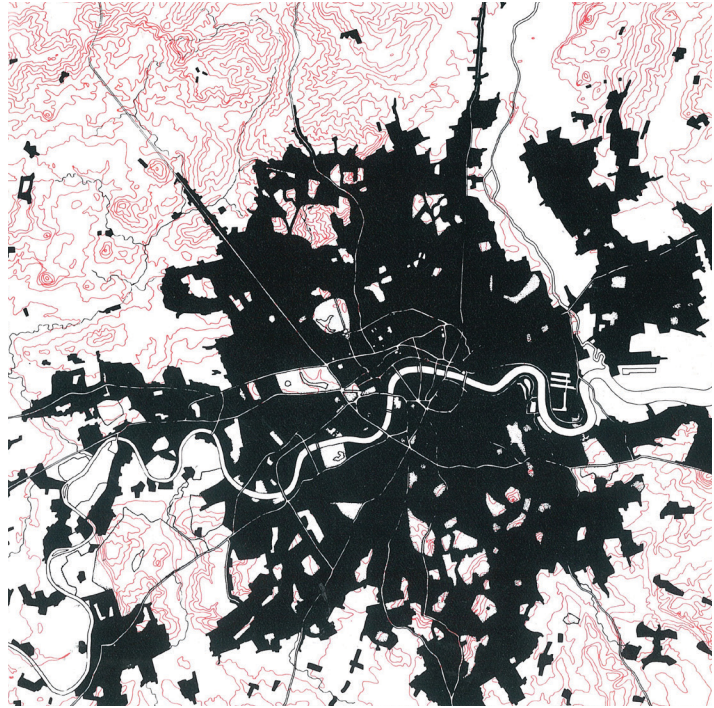


fig. 9. London - 19th Century

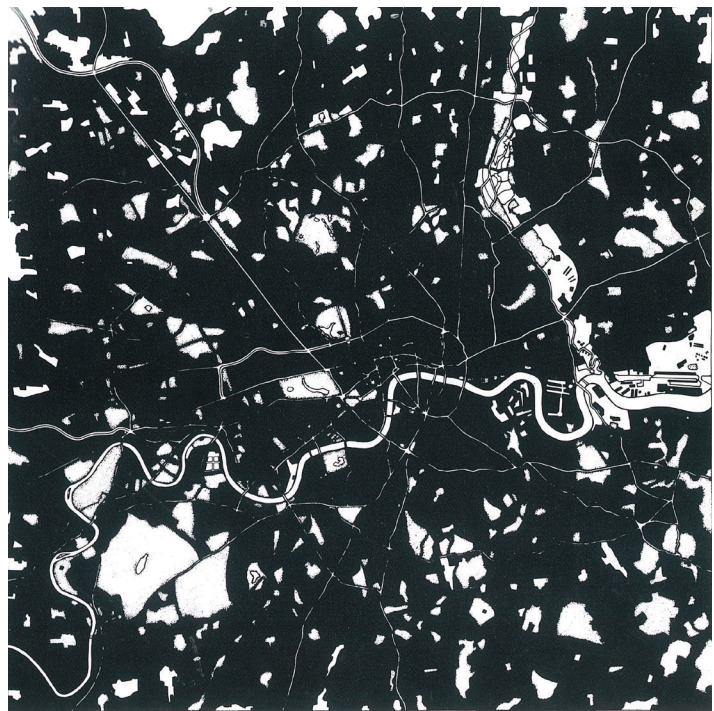


fig. 10. London - 20th Century

on par with, the natural universe beyond its domain.²² These geometrically simple inscriptions marking the territory of the new city acted as its first instances of infrastructure, establishing harmony in political, social, and ritual activity. As physical imprints the *cardo*, *decumanus*, and *pomoerium* provided, respectively, routes of travel and the containment of growth while as religious references they made evident the order guiding civil conduct, aligning the city with the cardinal bearings both as a physical entity and as a psychological construct. The Romans stationed at the outskirts of the empire, in the obscure camp then known as *Londinium*, could carry on their affairs and pursue their ambitions in the assurance that they were delimited and supported by the same auspices that governed Rome itself.

London continued to cling close to the confines of the Roman settlement through the seventeenth century, guarding the security offered by the city walls and accepting the stability of the familiar fabric.²³ However, as the eighteenth century drew to a close, London had begun to transform into a primary generator of the growing Industrial Revolution and, during the Georgian and Victorian eras, to develop into the centre of influence of a burgeoning empire.

The inscription of rail lines across the English landscape began to dramatically alter the conception of London. Cities that had previously required multiple stages of travel were now reachable within a day or less. The incredible expansion of transportation multiplied the capacity of activity and commerce inherent in the city. The potential of unbelievably fast motion opened the imagination of London's citizens to entirely new ways of inhabiting and using the City.

However, as the railways began to spread across England, limits were placed on their penetration into London. Despite the economy they brought with them, the centre was thought to be no place for the associated grime, noise, etc.—the rail termini were banished beyond the built-up area of the City. However, this necessitated additional transport from the stations to the City itself. Omnibus operation took up the task, running services along the New Road which stretched from the westernmost terminus at Paddington, past

22 *ibid.*, 130, 4-5. The sanctity of this boundary was so important that a death sentence was imposed on any who transgressed it by means other than the city gates and its expansion was reserved for only those who had extended the boundary of the empire.

23 Taylor, S., 10.

Euston and Kings Cross to the northern edge of the City. The added transit on the New Road attracted even more development and as traffic and commerce in the area around the stations intensified, this same route was followed by the world's first underground railway, cut into the New Road and then covered over again to restore the streetscape.

The growth of the railways and the subways not only siphoned people in to London but also drew London ever outwards. The possibility of living near the countryside but being able to travel into the city quickly and easily proved extremely attractive. As suburban services increased, settlements grew up along the branch lines.²⁴ Proposed boundaries defining the city, the defensive walls of the Roman encampment having long been breached from within, began to blur.²⁵ The spread of the urban area engulfed towns in the former countryside surrounding London, connecting them intimately with the City and rendering developments as far as 3.5 kilometres away nearly as accessible and as integrated with the city as Southwark across the London Bridge.

24 Barker, T.C. and Michael Robbins, xxv.

25 For a more comprehensive description of the relationship between the development of London and its transportation systems, see Taylor, S., 10-24

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The delimitation of space as provided by the development of transportation infrastructure defines the operation and conceptualisation of cities. Providing avenues of movement, segregating functions, sorting use and information, bundling or dispersing activity, transportation infrastructure provides the framework for the multitude of operations carried out by urban inhabitants and gives form to civic emotion. As Michel de Certeau describes in his book, *The Practice of Everyday Life*,

It is the partition of space that structures it. Everything refers in fact to this differentiation which makes possible the isolation and interplay of distinct spaces. From the distinction that separates a subject from its exteriority to the distinctions that localise objects, from the home (constituted on the basis of the wall) to the journey (constituted

on the basis of a geographical “elsewhere” or a cosmological “beyond”), from the function of the urban network to that of the rural landscape, there is no spatiality that is not organised by the determination of frontiers.²⁶

26 de Certeau, 123

Spatial structuring, controlled by infrastructure, generates the characterisation of place, supporting or limiting the activities which imbue space with specific meanings. The diversity of characters expressed in routes of travel serve as prime examples: cutting through the city, sinuous and self-contained, broad thoroughfares propagate a desire for speed, passage, and an increasing disconnection with the surrounding context. As de Certeau writes, “what allows us to move through . . . inscribes, indefinitely, the injunction to pass on; it is its order written in a single but endless line: go, leave, this is not your country, and neither is that.”²⁷ The winding, often interrupted, narrow alleyways of the dense, historic city, as a counter-example, engender a condensation of activity, slowing movement, and bringing the people who move along them into direct personal contact with each other and the spaces they traverse, coercing them to linger. Each infrastructure embedded in the city invokes specific affects, inflecting how the city is perceived and provoking tendencies in use.

27 *ibid.*, 112

Taken collectively networked routes of travel begin to define the personality of the city at large. The uniform grid road systems of North American cities bely an ambition of equalised space and movement, despite uneven topography or variances in density or use. Rem Koolhaas, in *Delirious New York*, describes how, “in its indifference to topography, to what exists, [the grid] claims the superiority of mental construction over reality.”²⁸ The arbitrary division of the island of Manhattan into hundreds of blocks cut by avenues and streets imposed both a limitation to the scope and a freedom through neutrality of any conceived action. Organised into discrete rectangles, “the city [became] a mosaic of episodes, each with its own particular life span, that [contested] each other through the medium of the grid.”²⁹ Navigation of the grid city, through parcel after parcel extending the length of Manhattan Is-

28 Koolhaas, 20

29 *ibid.*, 21

land, proposes a relentlessness wherein hierarchy is negated and travel in any direction is equally compelling.

However, an *a priori* scheme for the form and construction of a city is inherently limited in its scope. As aspirations which exceed the city's initial organisation principles emerge, new proposals are necessarily superimposed on the existing structure. In Rome, the Ur-city of London, water, sanitation, and transport infrastructures overlaid on the original form of the city were constructed to manage issues arising from increasing density and to accommodate the Republic's growing expansionist temperament. As Rome's colonial and military aspirations grew, the construction of supporting infrastructures, most conspicuously exemplified by the paved roads extending out from the city to far off forts and colonies, imprinted the martial character of Rome not only on its own urban structure but on the surrounding countryside, even to the edges of its frontiers. The strength of Rome could be recognised in the solidity of the basalt beneath a traveller's foot. The expansion of the road system paralleled the growing aspirations of Rome as it syphoned resources, knowledge, and even humanity itself into its increasingly dense and socially fertile fabric while at the same time spreading Roman order across the surface of Europe.³⁰

30 Relations between the growth of the empire to the spread of the road, aqueduct, and other infrastructural systems could be drawn but are perhaps best left for a more historically versed scholar. However, an exploration of the intrinsic relationship between the perception/conception of Rome and its aqueducts is included in the appendices.

31 Cooley, Charles H., 42, 69, 70.

32 Shannon and Smets, 84

Transportation infrastructure acts as a language, communicating the assumed relationship of society to the spaces it penetrates and encapsulates.³¹ Extrapolating the effects of systematic regulation, Kelly Shannon and Marcel Smets note in *The Landscape of Contemporary Infrastructure* that, "infrastructure, by its very nature, expands the public realm beyond the boundaries of a single space. It articulates the aspirations and dignity of contemporary society,"³² (or, conversely, the limitations of imagination of the same) and in so doing, concretely manifests guiding principles of development.

Electrical corridors, multi-lane highways, railways, and sewage systems are only a few of the most obvious traces of the latent structuring of space which guide civic action and ambition. They

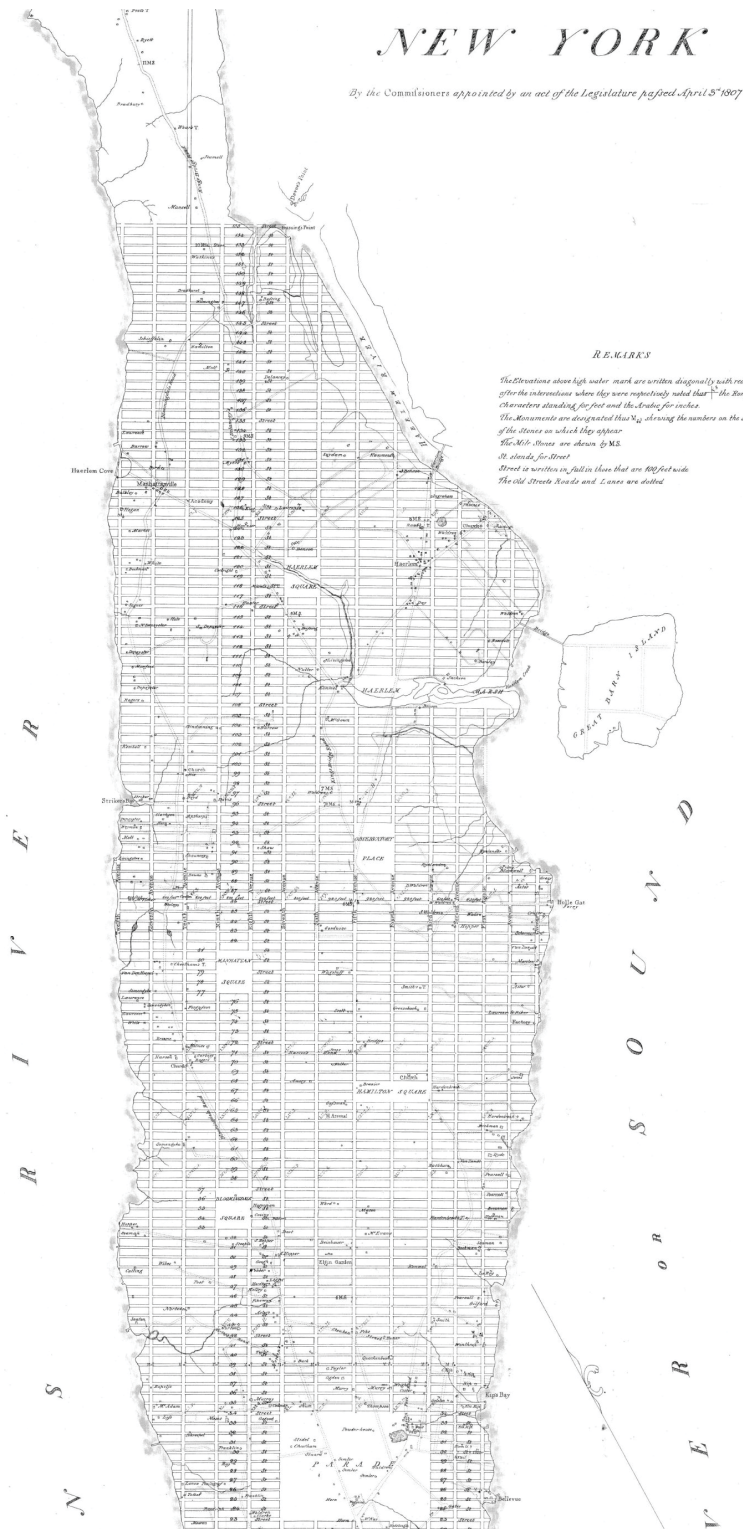


fig. 11. Manhattan - Commissioners Plan of 1811 (partial)

The grid projects its order across the island of Manhattan, overriding geography and assuming a relentless, uniform structure

fig. 12. Highway Signpost

The traveller begins to abstractly relate to the city long before its urban form becomes apparent.



33 Writing on exhibitions of the eighteenth and nineteenth century, Giuliana Bruno describes the transport induced by cartography and architectural models: “In the display of architectural sites, a body of spectatorship left home by way of topographic journeys. ... Not just a vicarious type of journey, this was the enactment of a different form of travel: an interior voyage, a journey of the imagination, an experience of heterotopia. “... One not only could go to Switzerland without leaving London but experience a new form of voyage, an architectural montage of places. As in topographical view painting, here the spectator was transported to (and by) the city viewed, as the city itself moved toward her. A new geography was constructed that adopted the principle of editing and created an architectural heterotopia—an “elsewhere now here” [sic]. 185

serve as reminders that the spaces which they permeate are loaded with notions of how a society functions and is woven together. The opportunities they permit are made evident within the city—the *Milliarium Aureum* of Rome, from which all distances in the empire were measured, gave Romans a concrete point from which to envision the spread of their power. From the centre of the city, they could imagine their domination over foreign states, exercising their influence simply by reading a name and a distance. Similarly, in the modern city, the lists of destinations on departure boards in a train station or the voltage specified on a socket (controlling how much electricity can be drawn from any one point) indicate the city’s available potential.

Reciprocally, infrastructure acts as a herald for the city beyond its borders. Milestones bring drivers into a relationship with the cities they measure distances from long before an encounter with a municipal boundary; iconic landmarks seen far off on the horizon give rise to the sensation that the city really is within reach.³³ In a more abstract way, installations such as hydro dams or power stations signal the immense amount of energy being consumed elsewhere even if there is no other indication of a settlement nearby.



fig. 13. CN Tower - Toronto

A fixed point in the city, infrastructure, in this case the transmission tower, acts as a near constant geographical, social, cultural, and civic reference.

The city is both bound by and revealed in its infrastructural works. The demarcation of its walls, the capacity of its sewers, the length and windings of its roadways each frame the domain within which the city's population can move and act. However, the idea of the city can no longer be conceptually constrained to the area within an historic *pomoerium* or even within modern municipal boundaries. The character of urbanity makes an impact as distantly as its critical infrastructures are able to spread. It would be absurd to confine the definition of London to the Square Mile or to its modern 32 boroughs. It can hardly even be said to be confined to its greater Metropolitan area—the City is insinuated in every other city it is connected to.

Apathy and Immobility

Stasis is death, the general law of the world.

– Paul Virilio, *Speed and Politics*

We need only refer to the necessary controls and constraints of the railway, airway or highway infrastructures to see the fatal impulse: the more speed increases, the faster freedom decreases.

The apparatus' self-propulsion finally entails the self-sufficiency of automation. What happens in the example of the racecar driver, who is no more than a worried lookout for the catastrophic probabilities of his movement, is reproduced on the political level as soon as conditions require an action in real time.

– Paul Virilio, *Speed and Politics*

The city is under constant threat, reliant on the complex coordination of its interwoven networks, the failure of any one of which can send the city spiralling into disarray. Through use over time, the threads of these networks accumulate an inertia, thickening and hardening, losing their flexibility as they increase in tension. The thickest threads dominate the system, attracting more and more use through a gravity of convenience, increasing to such a scale that they begin to preclude the growth of alternatives. Their heft demands attention, syphoning resources and sympathy out of proportion to their effectiveness in an aggressive investment of diminishing return. Too important now to fail but too immense to support their own weight, they strain the capacity of the city even in the basic demands of their maintenance—wearing elephants, pale with age, bones too brittle even to step aside.

Set in motion by intuitive propositions, the city gathers speed in growth. The networks and nodes prescribed at its foundation attract and guide the development of the city. Transit corridors chan-



fig. 14. California Street - San Francisco
The rigid partitioning of the city has an exaggerative effect - the road becomes pure linear movement, the spaces between compacted with apartments.

nel the movement of the population, collecting activity and density at their intersections, the distribution of resources and communication enabling the cascading spread of the city, while its boundaries strive to maintain and stabilise its size. The effectiveness of these infrastructures reinforces their prominence. The networks themselves begin to undergo development, accommodating increases in volume and intensity of use. The stamped earth of pathways overlaid with paving, the walls of the city thickened and re-clad, temporary markets given permanent foundations, and places of congress roofed and squared off—consistency of use becomes concretely evident.

The order engendered through this concretisation—the structuring of standard places to rest, eat, and shop, regulated routes and modes of travel, an accepted limit to the jurisdiction of the city, common media of communication—allows the city to be understood and navigated. A natural division and settling emerges as zones of commerce, residence, and industry are determined and begin to attract sympathetic uses and infrastructures. A legible cityscape develops. The typological forms of industrial waterfront development, with its associated warehouses and railway lands, or suburban tract housing, with its attendant meandering roadways and broad lawns, to give two well-known examples, segment the city into discrete, recognisable territories. These territories facilitate the accelerated growth of highly specialised uses, efficiencies gained through concentrated investments in development and precisely aligned infrastructures.

The zonal partitioning of the urban fabric is an extrapolation of the construction of simple boundaries. As the emplacement of a wall precludes free passage but to the advantage of the distinct separation of one space from another—interior from exterior, familiar from foreign, conditioned from chaos—so the segmentation of the city involves the abdication of flexibility in favour of a more firm determination; developed urban zones achieve a spatial and operational structuring attuned to their specific needs. The tendency to reinforce existing urban frameworks rather than invest in untested schemes is, for the most part, a safe and effective approach—what has worked in the immediate past is likely to continue to work in

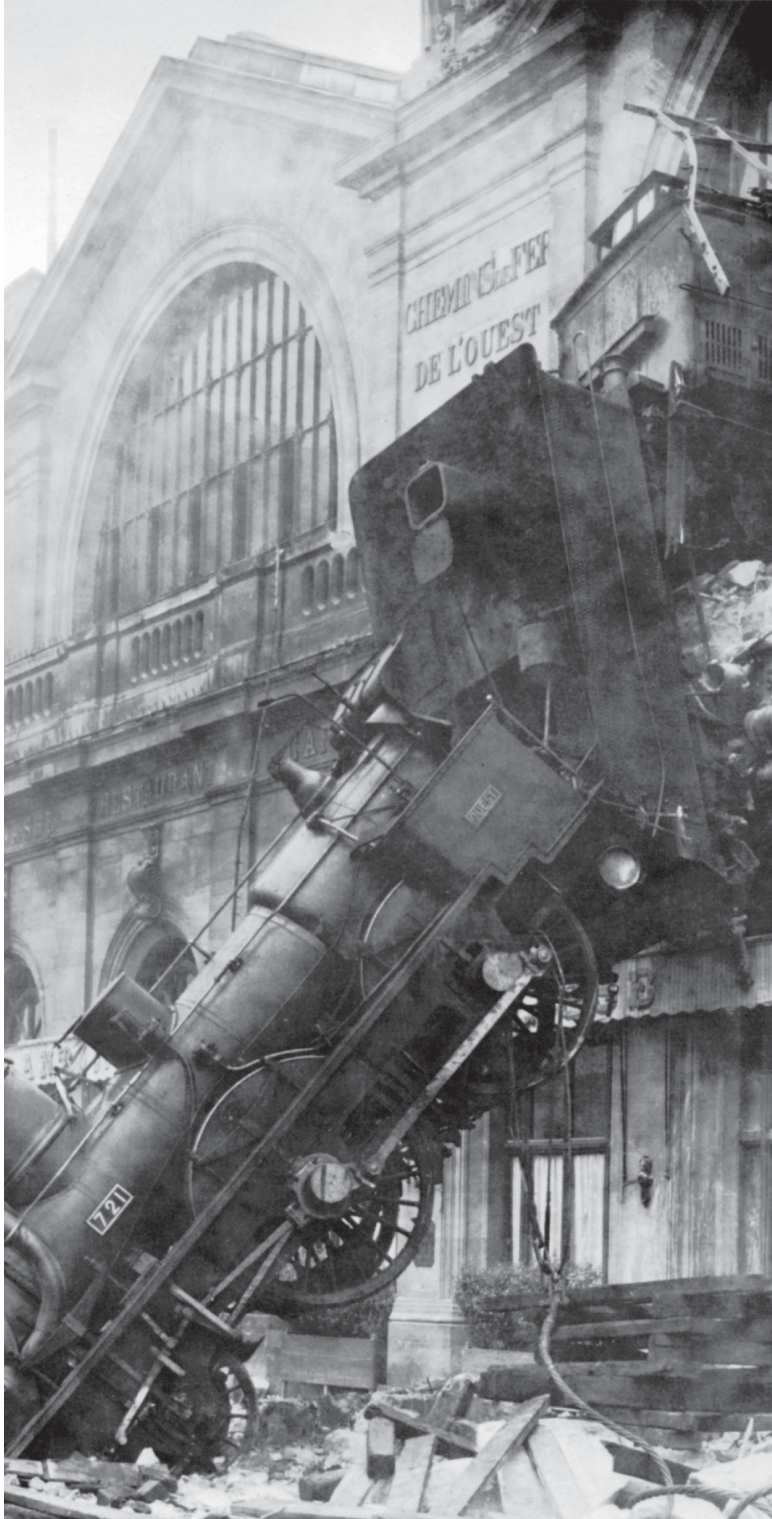


fig. 15. Train Wreck at Montparnasse
The failure of even one component leads to catastrophe; the brakes fail and the momentum of the train propels it to destruction. Or, paraphrasing Paul Virilio, the train begets the trainwreck.

the immediate future. But as the organisation of the city becomes increasingly defined and its infrastructures more rigidly specialised, alternative modes of operation become ever more difficult to establish even if they might better fit developing needs. The growth of monocultures, over-reliant on a single methodology or support system, is an inherent threat. The dismal state of single-industry towns (e.g. remote fishing or mining communities) after the resource their industry relied on has become scarce or unprofitable is telling. Without alternatives, bypasses, or redundancy, sectors of the city, or even the city as a whole, are at risk of cataclysmic failure should their structuring be insufficient to cope with demand or external influences.

As lifestyles, technologies, and desires change, urban infrastructure developed to accommodate a past state of urban affairs becomes less and less a support and more expressly an obstacle. The highway constructed for commuters from bedroom communities of less than one hundred thousand people now struggles to carry the daily rush of workers spilling in from a collection of exurban developments surpassing the city itself in population; the station built during an era when travel by rail was a rare and expensive occasion strains under the weight of two hundred thousand passengers embarking and disembarking every day; a digital network shaped to provide access to email and text-based webpages chokes on the mass of data transferred in constantly streaming video. The problem is not simply a matter of an inability to accommodate new conditions but of the associated entropy of quality for existing users as old systems and structures are called upon to support more than they were designed for. Infrastructures suffer from their own popularity, unable to expand at the same rate as the demands for them grow.

Even expansion, doubling in width or tripling in supported weight or halving wait times, only delays the inevitable constriction as use quickly escalates to take advantage of any additional capacity. The same problems of overloading recur until a confrontation with finite space permits no further growth and the city grinds headlong towards the disaster of immobility.



In Transit 2

The air in Trastevere was growing thick around us, slowly hardening and locking us in place like concentric circles of sampietrini. We had lived for fourteen weeks in Rome, circulating in the confined streets of the ancient city, wandering the labyrinth of winding ochre and orange walls, returning again and again to the same market, turning a corner and stumbling on the same statue or fountain, searching for an escape only to find ourselves in the same piazza.

From time to time a crew of city workers would rattle by in a truck far too small for their bulk, stopping somewhere in the neighbourhood to move a few cobblestones to the side of the road only to put them carefully back in place after a few hours. Walls would be stripped only to be replaced with stucco. Some years later, a third trip to Rome would confirm just how slowly the city moved—or perhaps it had stopped long before we first arrived. The Metro was still under construction, the same hoarding crowding the piazza in front of the Vittorio Emanuele II monument, pinching cars between the concrete barriers and the curb. At times it felt as though we, ourselves, had stopped

moving, stopped breathing, stopped remembering what life had been or could be elsewhere. Looking into the eyes of the Roman statues, the fear of ossification took hold. In desperation, we booked tickets for a train leaving in the early morning. As our bus rumbled through the streets toward Termini and the train that would pull us out from the entrapment that had been setting in around us, it seemed the buildings were being shaken apart—if we had forgotten something and turned back to retrieve it we would only find a pile of rubble.

At the station, light broke through the clerestory windows and drew us upwards to approach the sky before we bound ourselves to the iron ties. We took the fast train to Venice, its motion a perfect searing vector, melting off the encrustation of our three months in Rome. Within four and a half hours we were gliding over the Venetian lagoon. Though still bound within the peninsula, the instability of the island city offered refuge while we prepared to detach from the sluggish remnants of the empire. We haunted that city of masks, labyrinths, and dead-ends for two days, keeping to the shadows to avoid the heat and hoping to confuse

fig. 16. The route of our travels

1. Rome; 2. Venice; 3. Bregenz; 4. Stuttgart; 5. Frankfurt; 6. Köln; 7. Dusseldorf; 8. Duisburg; 9. Utrecht; 10. Amsterdam

any spectres that wanted to drag us back south. At half past ten on the second day, as the light of the moon sank into the lethargic water, we slipped onto a night train. Our exit was quiet, crossing the alps and the border into Austria in the dead still of the dark.

On the first of May, we took shelter in Bregenz. The May Day festivities had closed the shops and emptied the streets. We were left alone, with nothing to restrict our movement. At the city's gallery, the light we had so briefly glimpsed at Termini permeated every corner. It spread around us as we wandered through the streets and along the waterfront. As we drifted towards the station in the early afternoon, it pressed ahead of us, climbing the steps to the platform and pooling along the tracks. It reflected in blinding streaks off the train waiting to take us speeding north along the course of the Rhine. As the doors closed behind us, the train slipped forward into the shimmering, frictionless light.



fig. 17. Bregenz to Stuttgart



fig. 18. Stuttgart to Frankfurt



fig. 19. Frankfurt to Köln



fig. 20. Köln to Düsseldorf

Somewhere near Düsseldorf, as the sun glinting off the Rhine filled the cabin, we were released from the singular force of our motion. The train continued to speed north but our thoughts had decoupled and we drifted out, veering off from the rail line. Cities across the continent became vividly tangible.

At this velocity we could leave Lisbon at dawn and be at the far end of the Ukraine before nightfall. We could breakfast in London, have lunch in Antwerp, and eat dinner in Paris. Where a day's journey would once have only brought us to the outskirts of a city, 24 hours on a train could now encompass an entire continent.

Drawn towards each other by the bright white tangle of rails, the vibrant colours of Copenhagen's old harbour looked across the water to the stark lines of fascist Como. Malmö was buried deep in the Swiss Alps. Lausanne, Bern, Basel, and Zurich were threaded together like a rosary, the bells in their towers ringing on the hour as we sailed through each in succession. We entered the chapel at Ronchamp from the valley of Chur and exited onto the flat fields of Friesland. The springs

of Bath poured out of the Fontana Maggiore in Perugia. We fell asleep on the High Street in Edinburgh and woke up in the suburbs of Almere only to stumble, bleary eyed, into the industrial outskirts of Essen. The remnants of the Berlin Wall, cutting through Saint Wenceslas' vineyard on the slopes of Prague Castle, tilted and cracked as we passed.

Europe was contracting, flexing its sinuous energy. Flashes of electricity pulsed from one city centre to the next, melting the distance into amorphous pools. The turbulent landscape turned serenely amniotic—we watched as ports gestated below the surface of the water and as buildings emerged, turgid, from the earth. Metropolises coagulated from disparate villages, consuming themselves before feeding off of and ingesting one another, multiplying and expanding. The city was endless.



fig. 21. Düsseldorf to Duisburg



fig. 22. Duisburg to Utrecht



fig. 23. Utrecht to Amsterdam

Carried by inertia we stepped off the train, moving without effort along the platform, caught up by the ramped escalator and exhaled into the concourse of Schiphol Airport. From check-in to security to the gates to our seats on the plane there was no pause—not hurried in any way but completely without friction, like a noiseless breeze. The aircraft lifted to meet us as we sat down, already in the air before we had clasped the buckles around our waists. Only the westerly winds resisted, pushing us high into the atmosphere.

As the plane drifted away from Europe, our thoughts were lost somewhere over the Atlantic; the endless, placeless shimmer of the ocean below and the depthless blue of the sky offered no traction. Whether two hours, a day, or even months had elapsed was impossible to tell. All memories had been collapsed into vague hues and patterns. Thinking about one event or place was like seeing the entire trip overlaid and piled up on top of itself.

But as we neared Toronto, wisps of cloud slipping by the window broke our trance. The winds grew and the mass of air compressed the cabin,

dragging along the wings with an audible scrape. Pressing deeper into the dense atmosphere, we approached the runway; our velocity wasted away against the weight of the wind. The gears flexed open as we descended, jutting stiff from the underside of the plane to absorb the shock of the tarmac. The whine of the engines grinding against the air cut through what was left of our reveries, spinning and howling as we slowed to a stop. The city that had seemed to float beyond the runway as we made our descent now stood static, constipated in its resistance to our movement. The cabin pressure hissed like a cicada, falling to an almost imperceptible drone as we drew up to the gate.

The march to customs; the hypnosis of the spinning baggage carousel; the weary groan of the doors leading to the waiting hall; we had lost our velocity. We found a seat and waited to be collected. Our destination was less than 20 kilometres away but it might as well have been as far as Amsterdam, or Rome.

There was no way out of this terminal than by car or bus. To the north, east, and south were highways, the smallest with six lanes, the largest,

through some sections, with more than sixteen. But at 4.30 in the afternoon each square foot of asphalt would be occupied. The rush hour that would claim more time in the day than its name seemed to allow, had begun half an hour, maybe an hour before. The morning commute had ended only a few hours before that. Congestion was endemic.

Beginning in the 1950s the province of Ontario had embarked on a campaign of roadway expansion, continuing incrementally through the new millenium. The expansion facilitated the dispersion and domination of a culture fixated on space and cars but with each new lane came new traffic.¹ Highways did not ring the city, so much as keep it in a chokehold.

At any other point in Toronto we would have been equally stranded. While transit services grew at a reasonable pace through the quarter century after the first subway line opened on Yonge in 1954, with nearly two kilometres of rapid transit-way added each year, since the 1980's expansion lagged. Now, on average, less than half a kilometre of new track was built in a year.² On King

Street we would be packed, noses to the skin of our neighbours' necks in a standing-room-only streetcar; at Yonge and Bloor Station we would be pressed relentlessly, anxiously, toward the edge of a subway platform by a constantly replenished crowd of commuters; on Dufferin we would wait for over half an hour for a scheduled bus to arrive. Frequent breakdowns and unannounced delays further aggravated the limitations of movement in Toronto.³ Perhaps we should have walked.

We sat down in the airport's concourse to rest. With only our minds allowed to wander, we gazed around the hall. Distracting ourselves with the newspapers only brought further stress—at city hall the debate on another transit initiative had been re-opened and construction, which had just begun, ground to a halt.⁴ So while the city continued to report on, dither about, and reject plan after plan of proposed transit expansion for more than 40 years,⁵ we waited at the airport for our bus.

The lumbering vehicle pulled up under the terminal canopy. It growled hideously and shifted uncomfortably as we stepped on board. The doors jerked closed and the bus lurched away from the

1 The Toronto Board of Trade, 'Toronto as a Global City,' p 53, cites statistics showing that while the supply of roads in Toronto in lane-kilometres increased by 56 percent from 1986 to 2006 (compared to an increase in transit capacity of 18 percent), growing congestion has reduced speed and increased commuting time (by 17 and 16 percent respectively between 2001 and 2006).

See also Green, Keith. 'Stuck.' Moscow Mayor Yuri Luzhkov's attempts to solve the city's traffic problem by building more roads, more tunnels, instating one-way streets, eliminating traffic lights, in short, attempting to remove any obstacle to vehicular movement. But these attempts continue to fail.

2 Lorinc, John. 'Subways in the suburbs, a contrarian view.' Also, Lorinc, John. 'How Toronto Lost Its Groove.'

3 See Hume, 'Slow and Unreliable.'

airport. We were soon moving towards the highway but our thoughts were focused on our final destination, still miles from the subway station this bus would drop us off at. We watched the cityscape pass by in a blur. Telephone poles, subdivisions, solitary trees flickered past the frame of the window as the earth alternately rose and slowly fell away again. Sitting motionless in our seats, we were propelled by the inertia of the vehicle, a force we had willingly attached ourselves to but which now moved far beyond our control.

An abrupt acceleration caused the woman across from us to involuntarily constrict her muscles. I clenched my teeth. We were suddenly aware of our inability to change course—she gripped the armrests as her body was pressed deeper into the cushions. Anxiety took hold and locked her in her seat. Our floating will was fixed to the lane markings which seemed to extend infinitely into the distance. Diversion from the path was steadily becoming increasingly difficult or, more worryingly, disastrous, as the bus gained speed and raced towards the highway ever more quickly. Side streets receded into the distance before we could

apprehend them, the gravel and soil outside hardened into a dense smear of brownish-grey more solid than granite, the distance between one moment and the next shrunk into an undifferentiated, buzzing cloud.

Breathing deeply to calm her nerves, the woman seemed to resign herself to the constant movement ahead. Letting her eyes slowly close, she twitched slightly before falling asleep, fit snugly against the pane of glass and the passenger reading beside her, all of us now unconscious of our immobility within the whirring motion of the bus.

—

The percussive shock of the impact was sudden and stunning. The excruciating squeal of rubber grinding against asphalt ringing, the woman awoke to the landscape wrenching to a halt around her. The sensation that her linear motion had been reversed arose as her body seemed to float, the fluids in her ears struggling for balance after a half-hour of inertial tilt. She strained her neck turning to glance at the man beside her. She attempted to shift

4 Refer to the appendices for a view on the frequency of this sort of occurrence. The Sheppard and Eglinton transitways along with the SRT conversion have all been the subject of numerous city hall meetings.

5 Levy, Edward J., ch 4.2, ch 7.4, and ch 12. In chapter 4.2, Levy quotes a phrase repeated in multiple successive official plans for the City of Toronto which sums up the perpetual apathy of the city:

‘Toronto has planned before, but as the enthusiasm that led to the plans died away, the plans themselves have been pigeonholed as unpractical dreams, and never have its people displayed the tenacity of purpose to look upon planning for what it undoubtedly is - the most valuable tool in civic development. Now, after a lapse of years, another start is made, but with infinitely greater difficulty due to the accumulated neglect of the intervening years.’

slightly, hoping the movement would wake him so she could start gathering her bags but a prickling sensation down her right leg made her wince. She fell back in the seat as the pain throbbed, resting her cheek against the head rest, still turned towards the man. She left one eye closed, unable to keep focus with both—his body was slumped awkwardly into the aisle, his book sliding slightly along the floor and his legs pinned between his bag and the seat in front. Pulling against the weight of her eyelids, she looked intently at his profile. A drop of red slipped from his ear lobe.

The pain in her leg shot up through her body as she jerked away from him. The high-pitched whine still rang in the air cut by gaseous hisses and the sound of creaking steel. A slow, heaving groan pulsed in her stomach before spilling out of her mouth, followed quickly by vomit as she felt then saw the buckled wall of the bus piercing her thigh. She watched as a mixture of blood and bile dripped down her leg, gasping sharply and convulsing as she felt a centrifugal spin, collapsing in a faint over the armrest and on to the stomach of the unconscious man.

Adaptation and Mobility

... it is pointless trying to decide whether Zenobia is to be classified among happy cities or among the unhappy. It makes no sense to divide cities into these two species, but rather into another two: those that through the years and the changes continue to give their form to desires, and those in which desires either erase the city or are erased by it.

– Italo Calvino, *Invisible Cities*

Infrastructure is inseparable from the urban condition. Acting as the framework for the mobilisation and organisation of people, goods, and information, infrastructure must respond to and help shape the flows and desires directing the development of the urban field. However, the exact forces involved in this relationship are difficult, if not impossible, to measure and predict. Expanding on the architect Yorgos Simeoforidis' assertion: 'The city—the urbanised territory—... is the product of a complex interaction between totally different subjects,' not only, 'in conflict with each other' but unstable entities in and of themselves.³⁴ The lasting influence and durability of infrastructure is unstable by extension. Any framework imposed on these variable systems is bound to become obsolete.

34 Simeoforidis, 419

Incorporating the dimension of time becomes as crucial in planning as the spatial and volumetric values of length, height, and width. Context cannot be thought of solely as the present condition but the realisation of the present through past development and the countless possibilities of its future change.³⁵ As the forces through which the city is controlled are in flux, any system which engages them must be agile and open ended. The recognition that neither use nor form will remain static is essential to the conception of infrastructure. Stan Allen posits in his essay 'Points + Lines', that infrastructures which hold their relevance are 'flexible and antici-

35 Doxiadis, 7

36 Allen, 55

patory. They work with time and are open to change. ... They do not progress toward a predetermined state (as with master planning strategies), but are always evolving within a loose envelope of constraints'.³⁶ As the needs and preferences of the urban population change, infrastructure must adapt or risk obsolescence, it must accommodate rather than become an imposition, lest it perpetuate that dread state of immobility through obstinance.

37 Heynen, 158-9

The construction of infrastructure is an operation in tentative projection and anticipation. Infrastructure must be built to accommodate a range of flows, uses, temperaments, and economic factors over time. The tension between permanence and flexibility is pronounced. The ideal infrastructural system, akin to the New Babylon proposed by (the Situationist) Constant Nieuwenhuis in the 1970s, would be immediately responsive to shifts in inclinations or attitude, adjusting shape, texture, temperature, opacity, speed, etc. in perfect synchronisation with its users.³⁷ However, today's highways, sewers, digital and electric networks, etc. are bound to the economics and physics of technology and the construction industry. Decades elapse between the planning of a project and its completion. The concrete manifestation of a system of flows is obliged to occupy the urban landscape for a substantial period of time and to remain static for much of that duration.³⁸

38 Habituation and a sense of place thus remain factors in interactions with infrastructure as Neil Leach discusses: 'An identification with place may be developed out of the repetitions of ["performative"] gestures within [infrastructures]. Through an accumulative process of bodily remembering, a sense of "belonging" is built up ... a model of identification with place which is in tune with the increasingly nomadic nature of contemporary existence.' 13

39 *ibid.*, 13. Leach notes this surrender as a key component of the relevance of the thing or system with which one interacts: This 'sacrifice may serve as ... a mechanism of vitalisation--of giving life force to some otherwise inanimate object [or environment] through the destruction of an animate being-- [leading] to an equating of the self to that environment, which in turn contributes to a process of identification.'

Far from fleeting, infrastructure must contend with its persistence. Urban inhabitants invest themselves substantially in the systems and infrastructures they interact with, relying on them for the most basic of functions. They surrender themselves and their identities to the idiosyncrasies of systems which are seldom in exact tune with their needs and, more often than not, technologically outdated or uncomfortable in their newness; they sacrifice aspects of their desires to the control of the infrastructure they use in order to receive access to its mobile and organisational potentials.³⁹ In framing the possibilities of action, providing the means for movement, for sustenance, for communication, infrastructure not only supports but also shapes the limits of identity.

For the most part, these limitations are benign. Infrastructural systems respond to consistent investment, use, and habituation by

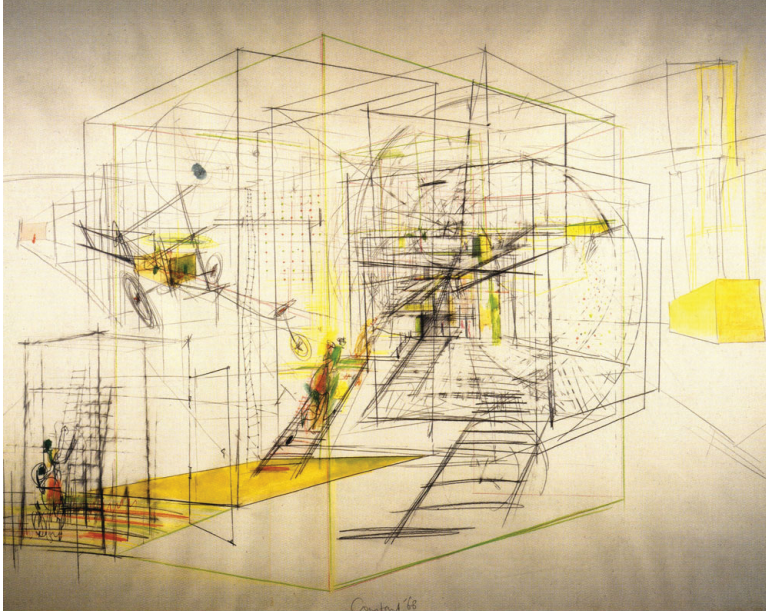


fig. 24. Sketch for a mobile labyrinth, Constant, 1968

Figures move through an unstable but responsive environment, passageways or walls extending as their desires expand or contract

providing a semblance of continuity and a breadth of opportunity through which action and experience can be structured. And as the infrastructural networks expand and evolve, so too do the potential experiences available to the urban inhabitant who uses them. The sophisticated urbanite can exploit these evolving networks and landscapes to create a personalised sensuous lifestyle. Through the gradual dissemination of the urban condition comes the possibility for each urbanite to live a life entirely of his or her own choosing, to claim a portion of the urban experience to him or herself.

The spread of infrastructure which homogenizes aspects of the urban landscape also makes a unique and heterogeneous urban experience, composed of disparate and distant components, possible. A sense of place, a stable routine, can be culled together through temperamental mobility.⁴⁰ Redundancy, overlap, and interconnection allow ever increasing idiosyncratisation of the urban condition. Routes and habits are fragmented—communities are no longer formed through confinement to limited physical space but rather through a shared routine or pace spread across the urban territory.

At the same time, the urban inhabitant becomes an expert at the cunning tactic which Michel de Certeau labels as ‘the art of making do’.⁴¹ The legal restrictions controlling the movement of automo-

40 Palmboom, 272 and Geuze, 256

41 de Certeau, 18. ‘What is there called “wisdom” (sabedoria) may be defined as a strategem (trampolinagem, which a play on words associates with the acrobatics of the mountebank and his art of jumping on the trampoline, trampolim), and as “trickery” (trapacaria, ruse deception, in the way one uses or cheats with the terms of social contracts). Innumerable ways of playing and failing the other’s game (jouer/déjouer le jeu de l’autre), that is, the space instituted by others, characterise the subtle, stubborn, resistant activity of groups which, since they lack their own space, have to get along in a network of already established forces and representations. People have to make do with what they have.

fig. 25. Reclamation

A parking lot is adopted as a motorcycle training ground while, in the distance, former industrial docklands are converted to office blocks and residential neighbourhoods



biles (prohibiting driving on sidewalks, through construction sites, or across parks—an irksome restriction, certainly, to some drivers of particularly large sport utility vehicles), does not absolutely prevent the mounting of a curb or passing along a highway shoulder when the motorist is confronted with an aberrant traffic jam or roadblock. An impatient pedestrian may likewise jaywalk or cross against the light, skirting the imposed traffic regulations even as the system remains intact. A feeling of nervousness arising if, in the middle of the act, the lawbreaker catches the eye of a disapproving fellow citizen or notices a police car idling at the intersection, testifying to the abnormal nature of the behaviour. These playful reclamations of minor freedoms lost in the increasingly rigid organisation of the city make apparent aberrant desires, tendencies in conflict with the order that makes the city predictable, safe, and usable.

However, as an infrastructural system becomes increasingly restrictive or outmoded and stands in conflict with the expectations of its users, their willingness to adapt to its peculiarities or to abdicate their grander aspirations wears thin. Confronting the same hour long traffic jam to and from work each day becomes abrasive; forced to stand a half hour on the train without a seat, wearies the

commuter; dropped calls and lagging connections frustrate business operations and personal relationships; the risks imposed on cyclists navigating streets without bike lanes causes debilitating anxiety. The city out of tune with the needs of its inhabitants acts as an impediment to their progress. The inertia which once propelled the city forward, carrying its citizens along, now sits like deadweight on those trying to supersede its limits.

In ‘Lethal Theory’, an essay on the tactics used by the Israeli Defense Force during its invasion of Nablus, Eyal Weizman explores the motivations and consequences involved in the confrontation between the physical organisation of the Palestinian city and the conflicting aims of the invading force. The city, in the view of IDF’s Brigadier General Aviv Kokhavi, was a field too well known by the opposing force, too rigidly controlled by them, and too spatially restrictive. The risks inherent to his troops in conforming to the structure of the city’s streets and walls were far too great. Instead, Kokhavi proposed to break through these constrictions. Weizman quotes him relating a speech he gave before the battle,

I said to my troops, “Friends! This is not a matter of your choice! There is no other way of moving! If until now you were used to moving along roads and sidewalks, forget it! From now on, we all walk through walls!”⁴²

42 Weizman, 56

In the ensuing assault, the soldiers undermined the historic organisation of the city, avoiding the standard use of alleys, doorways, stairs, windows, even streets and squares, instead breaking their way through walls and cutting vertically into apartments above and below as they wormed their way towards their targets.⁴³ The blasts of their explosives nullified the limitations (or, conversely, the protection) created by walls and surfaces—the dense, differentiated fabric of the city became a malleable volume, three-dimensionally penetrable.

43 *ibid.*, 53

Though the appropriation and reorganisation of a city is rarely so immediate, due to the inertia existing infrastructures have acquired over time, shifting temperaments and technologies must necessarily assert themselves violently to effect a change. The restruc-

fig. 26. *Walking through Walls*
 The invasion of Nablus rends unimagined
 and disruptive connections through the
 flesh of buildings



turing of Paris' transport and sanitation works under the direction of Baron Haussmann in the mid-19th century is exemplary. Paris' complex and claustrophobic mediæval street system, which had developed incrementally in alignment with the growth and spread of the capital city's population and the functioning of its monasteries and trades was increasingly perceived as a hindrance to the industrialisation of commerce. A network of boulevards was torn in straight lines through the meandering existing streetscape, linking key points of the city, and creating a correspondence between the urban fabric and the pressing requirements of the modernising capital's human, economic, and mobile populations.⁴⁴ The broad avenues released the clotting which had been restricting the flow of modern means of travel through the mediæval streets and allowed for an unprecedented freedom and smoothness of movement between the iconic, transport, and cultural focal points of Paris even as they obliterated the historic character of neighbourhoods.

In contrast to the deep fissures imposed on Paris and the devastation wreaked on Nablus, the evolution of London's transportation networks is a model of civility coupled with perseverance.⁴⁵ From the opening of the Metropolitan District Railway in 1863 through to the 1930s, London had continued to expand its under-

44 Saalman, 14-6

45 While the bombings of the second world war marred the fabric of the city above and precipitated many reconstruction and renewal projects, there was little change to the underground save for its temporary and various wartime uses as bombshelter, aircraft factory, control centre, etc.



fig. 27. Baron Haussmann's 'renovation' of Paris

Deep gashes are cut into the historic fabric, channeling the new dynamism of Paris' citizens

ground transit lines with coverage extending almost 10 miles in every direction and even further, up to 25 miles, to the west and northwest. But following the second world war and through the 1960s, as the availability of and fascination with automobiles grew, fewer Londoners used the City's transit services. Proposed expansions were abandoned, many routes on the mainline services were shuttered, and the government turned its attention to building more roads instead.⁴⁶ Mercifully, the United Kingdom's undiverted obsession with the car was relatively shortlived. While a culture of personal transportation continued to grow, so did the frustrations experienced by commuters trying to make their way to and from the City. The need to alleviate the increasingly debilitating congestion prompted a return to focus on transit services.

Construction on the underground Victoria Line, originally proposed in the 1940s but put on hold while London had its affair with the car, began in the 1962 and opened in 1969. Work on the first phase of the Jubilee Line, running from Stanmore to Charing Cross, followed almost immediately with construction completed in 1979. While further phases had been planned for the line, the exact course of the extension was debated.⁴⁷

During the 1980s, a new motivation took hold of London—the

46 Taylor, S., 21. From 1950 to 1965, private automobile ownership quadrupled. See also Thompspon, Gavin et al., 'Olympic Britain,' 129-30 and 133-7.

47 Taylor, S., 23

docklands to the east of the City, where shipping and industry had dominated land use until their decline began in the 1960s, were envied by developers for the immense size of their developable land and for their proximity to the city centre. The government created the London Docklands Development Corporation to initiate the restructuring of the lands and their reintegration into the city. As a first response, the Docklands Light Rail was constructed. But as early as the end of the 1980s the DLR was already struggling to keep pace with demand—beyond the expected residential development, Canary Wharf had been transformed into the largest centre of commerce in Europe, accommodating employment for over 50,000 people.⁴⁸

48 Melvin, J. et al., 5-6

The proposal to extend the Jubilee Line, now with a route directed through the Docklands, was resurrected. While the original Jubilee Line had limited visibility, running through the more dispersed suburbs or under the old city and was generally restricted in scope to service and station interconnections, the new extension would pierce through the Docklands and form the backbone of its new development. Roland Paoletti was appointed as Architect in Chief of the new line. His work with the Hong Kong Mass Transit Rail system where he had overseen the development of three lines and 36 stations, differentiated only by colour, gave rise to a contrasting notion that the new stations in London needed to reflect the culture and aspirations of the expanding city. Each station would be designed distinctly by London-based architects.⁴⁹

49 *ibid.*, 5-7



fig. 28. London's Jubilee Line Extension

A-A Victoria Line

B-B Jubilee Line

C-C Jubilee Line Extension:

1. Westminster

2. Waterloo

3. Southwark

4. London Bridge

5. Bermondsey

6. Canada Water

7. Canary Wharf

8. North Greenwich

9. Canning Town

10. West Ham

11. Stratford

Westminster

Michael Hopkins and Partners

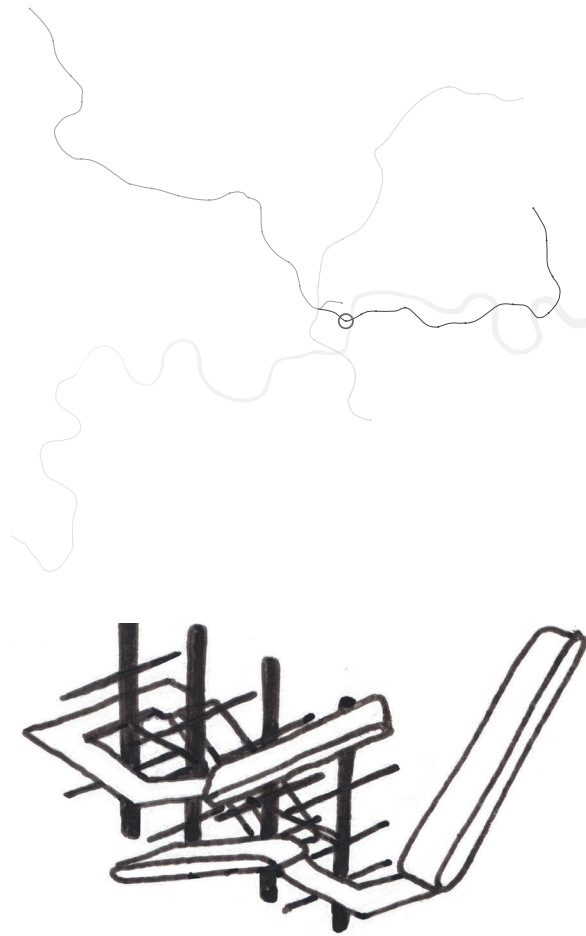


fig. 29. Location Map and Diagram

The first operation on the Jubilee extension diverted the line slightly from its original course. The original terminal station, Charing Cross, was abandoned in order to tap a new connection at Green Park and create a station at Westminster.

Boxed by metre thick diaphragm walls and braced by horizontal steel members, the new station navigated a complex maze. The new interchange sank deep into the soil bounded by the Parliament, Big Ben, and the River Thames, extending below the existing District and Circle tube lines, all the while supporting the construction of a new parliamentary building, the Portcullis House. Escalators and stairs criss-cross between massive piers, struts, and buttresses which balance these tremendous forces against each other.[†]

To access the trains now, one must descend into a labyrinth shaped by the immense weight of the site's history, structure, and politics.

[†] Hopkins Architects. Westminster Underground Station. <www.hopkins.co.uk/projects/8/109>. Accessed 30 January 2014; And Powell, 18-9.



fig. 30. Labyrinth

Massive piers and beams hold the weight of the site at bay.

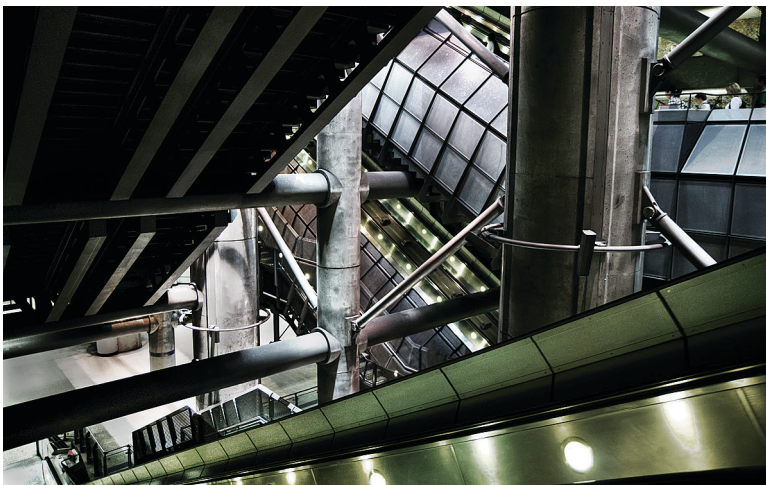


fig. 31. Labyrinth

Escalators and walkways navigate the tense space left between the nation's history, its current politics, and its mobile aspirations.

Waterloo

JLE Project Architects

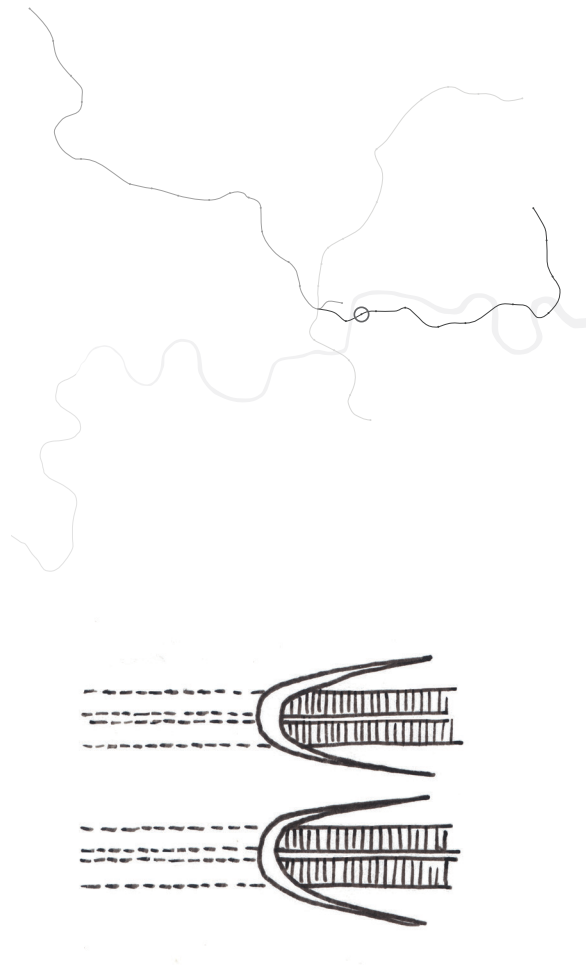


fig. 32. Location Map and Diagram

At Waterloo, the line is even more stealthy, slipping surreptitiously beneath the great behemoth of the historic railway station above. The new underground station cuts its space out of the bowels of Waterloo, occupying former loading and service areas, opening the innards of the United Kingdom's busiest railway station to the street.

Inside, one parabolic mouth siphons departing travellers into the throat of the parasitic creature below while another regurgitates them into the waiting stomach of Waterloo Station. The tendrils of the new station reach down to the Jubilee Line track level and stretch beneath the rail station above to connect to the existing Bakerloo and Northern underground lines.[†]

[†] Powell, 30-1

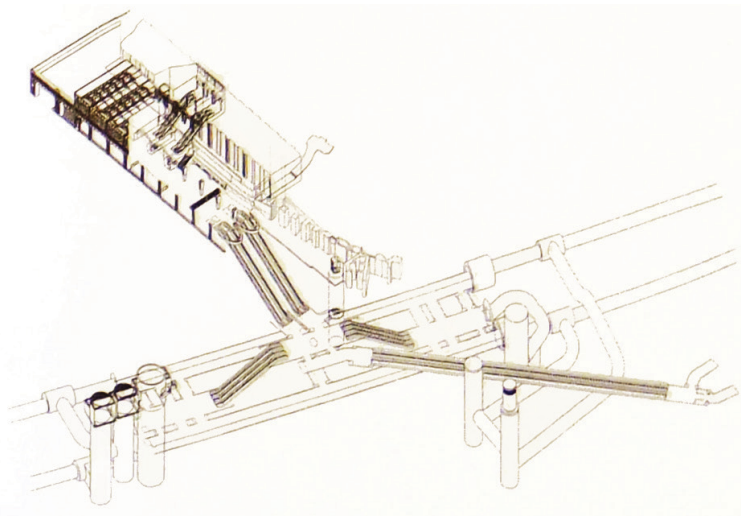


fig. 33. Appendages

The tendrils of the station reach down to the underground tracks and stretch beneath the rail station to the existing tube lines.



fig. 34. Open mouths

Passengers are swallowed and expelled by the funneled openings of the parasitic station hiding below the railways.

Canada Water

JLE Project Architects/Herron Associates



Canada Water's glass drum acts a symbolic pivot for the extended line, sitting midway between Westminster and Stratford Stations. The self-presumed heft of the extended line and the development that is expected to grow above weigh heavily on the old Overground.

The East London Line lies, compressed, below the expansive space and massive columns of the new ticket concourse, barely eking out headroom for its passengers. The new Jubilee Line, though even further below ground, swells and exerts pressure on the Overground line from below, saturated with passengers and the promised wealth of future development.[†]



fig. 35. Location Map and Diagram

[†] Powell, 84-5



fig. 36. Central pivot
The heft of the glass drum acts as a hinge for the extension line.

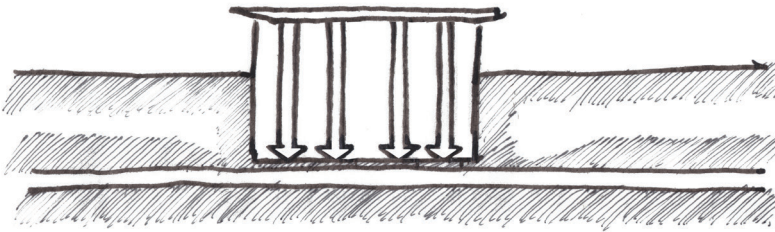


fig. 37. The weight of expectations
Massive columns await use in anticipated development and compress the East London Line below.

Canary Wharf

Foster & Partners



Little indication of the expansive space contained in Canary Wharf station below is given above-ground. Only three domed entrances protrude into the plaza reclaimed from the West India Middle Dock. They appear to be aberrant growths or foreign invasions into the field of grass which roofs Canary Wharf's cavernous interior.

But even more foreign is the station's generosity of scale. Below the park space, elliptical columns rise nearly 20 metres and run the length of the 265 metre station, supporting a roof that spans almost 35 metres from wall to wall.

Smooth concrete and stainless steel reverberate with the shuffling murmur of London's commuters making their daily amble through the station on the way to the Canary Wharf business district. A city used to narrow, winding streets and the cramped warrens of the underground is awed by the unexpected expansion of space.[†]

fig. 38. Location Map

[†] Powell, 98-9



fig. 39. Processional

While their bodies descend to the trains, passengers' thoughts ascend past the vaulted ceiling. Open space seems to extend infinitely above and outwards through the three domed entrances.

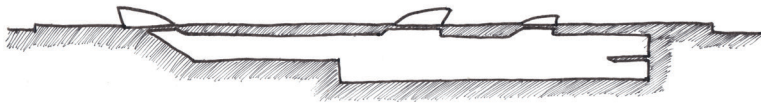


fig. 40. Hidden expanse

The half-domes protruding into the plaza above give barely any indication of the cavernous space below.

North Greenwich

Alsop Lyall & Störmer/JLE Project Architects



fig. 41. Location Map and Diagram

Bound by the Thames on three sides, North Greenwich is practically a transit island. Separated by the river from adjacent stations and bus routes, the non-time of subway motion—traveling through dark caverns without reference points—is accentuated. Drawing on this indeterminacy, North Greenwich's open grid ceiling, deep blue mosaic tiles, fathomless glass, slightly askew columns, and parabolic profiles make the boundaries of space difficult to decipher.

With reference points obscured, travellers float through the station, uncertain of the time of day or where in the city they might be. Time and space are muted in the station's cobalt surfaces.[†]

[†] Powell, 112-3



fig. 42. Indeterminacy

The deep cerulean and indigo hues of the tiles and glass make judgement of distance and size difficult.

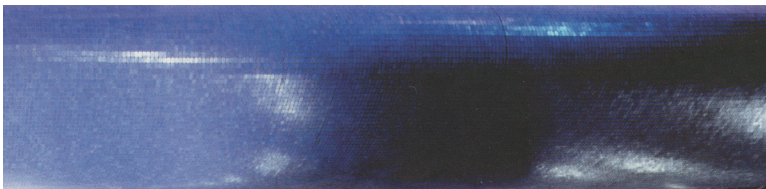


fig. 43. Time and space obscured

The mysterious, indeterminate time of underground travel is given a spatial and visual parallel.

Canning Town

John McAslan & Partners/JLE Project Architects

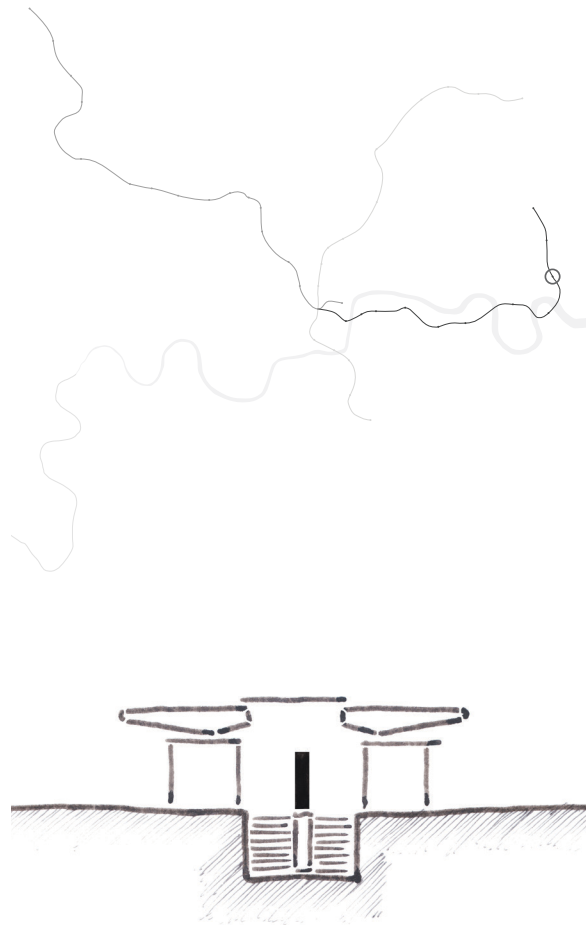


fig. 44. Location Map and Diagram

Unapologetically high-tech in affect, Canning Town is a spidery and lightweight contrast to the solidity of the iron industry that formerly occupied the area. Brute force and substantiality is supplanted by fragility and airiness. Slender columns support precariously balanced roofs; glass walls buffet the wind of passing trains.

Though bounded by traffic, the Bow Creek, and the A13 highway, the station appears barely tethered to its surroundings. The Docklands Light Railway, the Jubilee Line, and the city's buses slip in and out of Canning Town with alarming speed, pulling the station in all directions. Only the weight of a commemorative iron slab, salvaged from the *HMS Warrior* (constructed nearby in 1859-60 by the Thames Ironworks & Shipbuilding company) prevents Canning Town station from slipping away.[†]

[†] Powell, 130-1



fig. 45. Unmoored

Barely tethered to its surroundings, the station appears set to drift down the Bow Creek to the Thames and out to the sea.



fig. 46. Anchored

Canning Town's ephemeral presence is anchored only by the great slab of iron set at the entry.

Success of the Jubilee Line Extension depended on the pliability of its planning and its responsiveness to the motivations of its future users. Adaptation of station sizes, tunnel alignments, etc. as the project was re-initiated and brought to completion certainly added to the immediate costs but created a immeasurably stronger affinity between the projects and the desires which were to fill them.

The constant push and pull between these states ideally approximates a harmonisation with the present. As adjustments are made, the balance between the fixed or familiar and the flexible or anticipated is constantly renewed.⁵⁰ Though continuous readjustment from moment to moment is not practical, the anticipatory design of infrastructures aims to bring use and capacity into close alignment for as long a duration as possible. Thoughtless repetition of old methodologies is not a valid option but neither is the willful denial or suppression of preceding modes of operation. Infrastructural works must be acts of pre-emptive reflection.

Beauty today can have no other measure except the depth to which a work resolves contradictions. A work must cut through the contradictions and overcome them, not by covering them up, but by pursuing them.

– Theodor W. Adorno

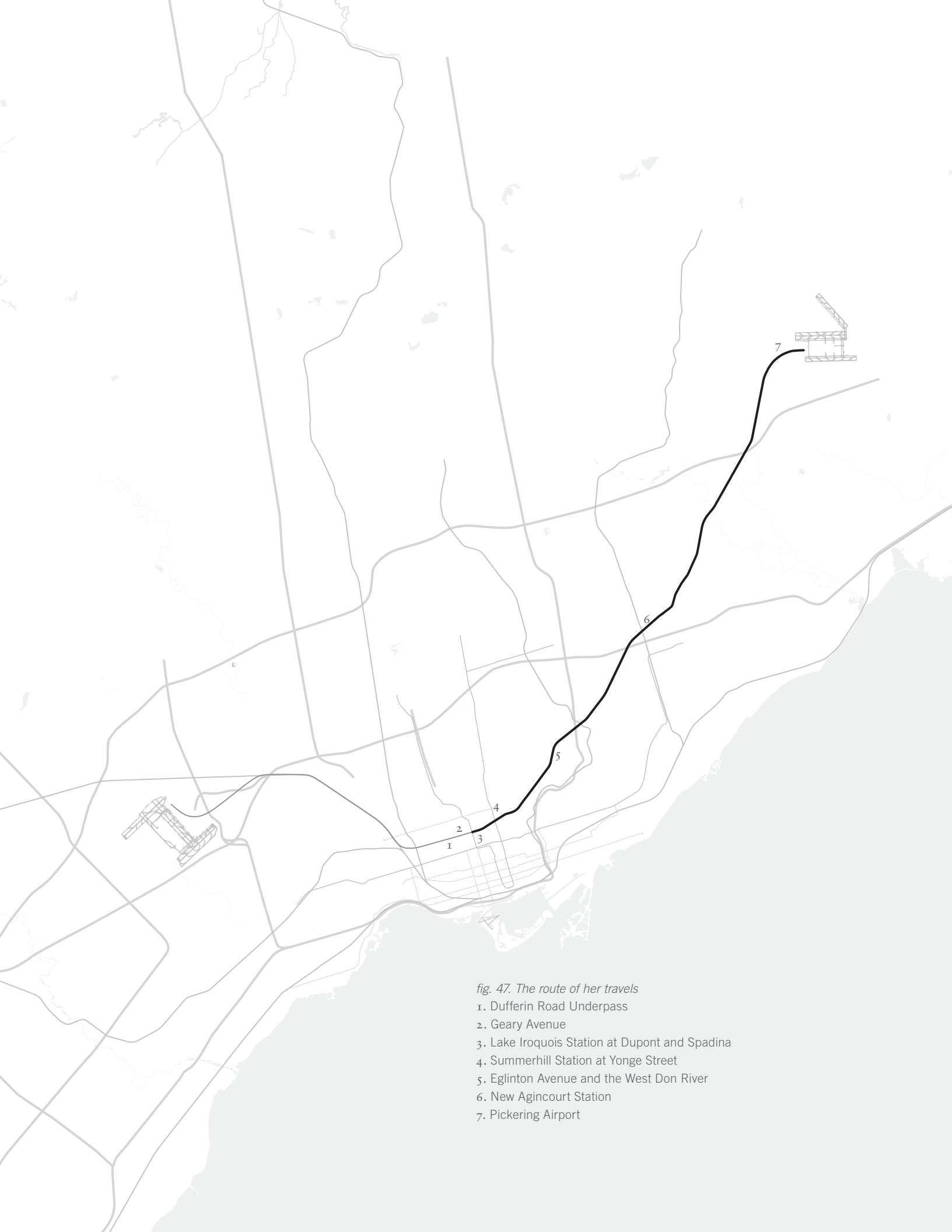


fig. 47. The route of her travels

1. Dufferin Road Underpass
2. Geary Avenue
3. Lake Iroquois Station at Dupont and Spadina
4. Summerhill Station at Yonge Street
5. Eglinton Avenue and the West Don River
6. New Agincourt Station
7. Pickering Airport

In Transit 3

In the afternoon, she packed a small bag and cycled north towards the rails. As she took to the road, her pace was tentative. The perception of the unequal weight and shape of her legs was still apparent after four years of rehabilitation. The alloy prosthetic moved smoothly beneath her pant leg, rising and falling in alternating rhythm with her own flesh and bone, but the resistance of the pedal two feet below where her thigh had been cut still sometimes came as a surprise.

Her leg had healed more quickly than the emotional trauma from the brutal accident on her ride home from Pearson; the ghostly anxiety of the trip lingered. The lurching stop-start motion of buses still brought back her nauseous reaction to the experience. And she had never owned a car (the fear of navigating the highways now was almost as paralysing as the congestion which plagued the city's roadways). Though after a few months she could get around nearly as well with her prosthetic as she could before the accident, the city's scant transit options often kept her indoors. Even in the summer when she would venture out on her bicycle she felt constrained; she could cross

the city in less than an hour but the aggression of the drivers she had to share the road with made her feel like she was swimming with sharks.

When she heard the plan for a new passenger rail line just north of her apartment she had been confused—she felt the vibrations of the freight trains every once in a while but otherwise she had forgotten about the Canadian-Pacific Railway corridor. As the plan developed she started to take more notice of her encounters with the railway on her infrequent bicycle trips around the city, surprised when she crossed under it in places like Don Mills and Weston. She began to imagine quick trips to the Junction and St Clair or the Ontario Science Centre. More startlingly, she even thought about going to Pearson again or to the new airport in Pickering and all the destinations connected beyond. Now, after four years of imagination, she was finally on her way, slipping loose of the tight radius she had been confined to, cycling to catch the train.

When Pickering Airport opened to the northeast of the city, the rhythm of trains passing through the city had increased. The steady pulsing



fig. 48. Dufferin Road Underpass

The weight of the trains carrying distant cities into Toronto splits the ground.

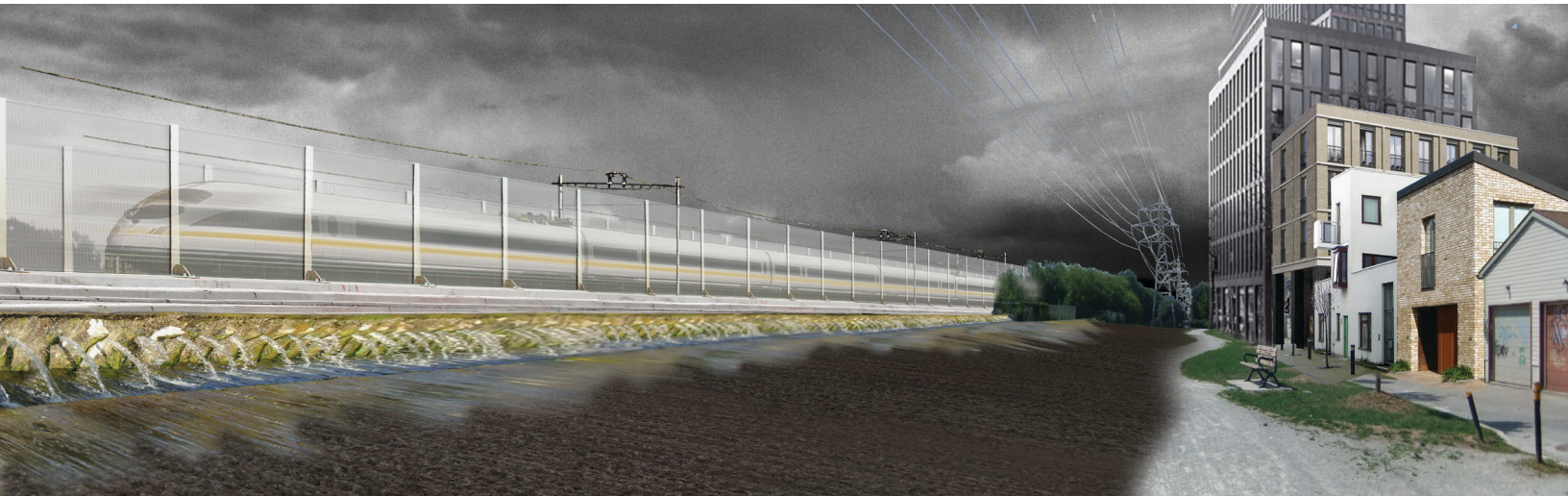
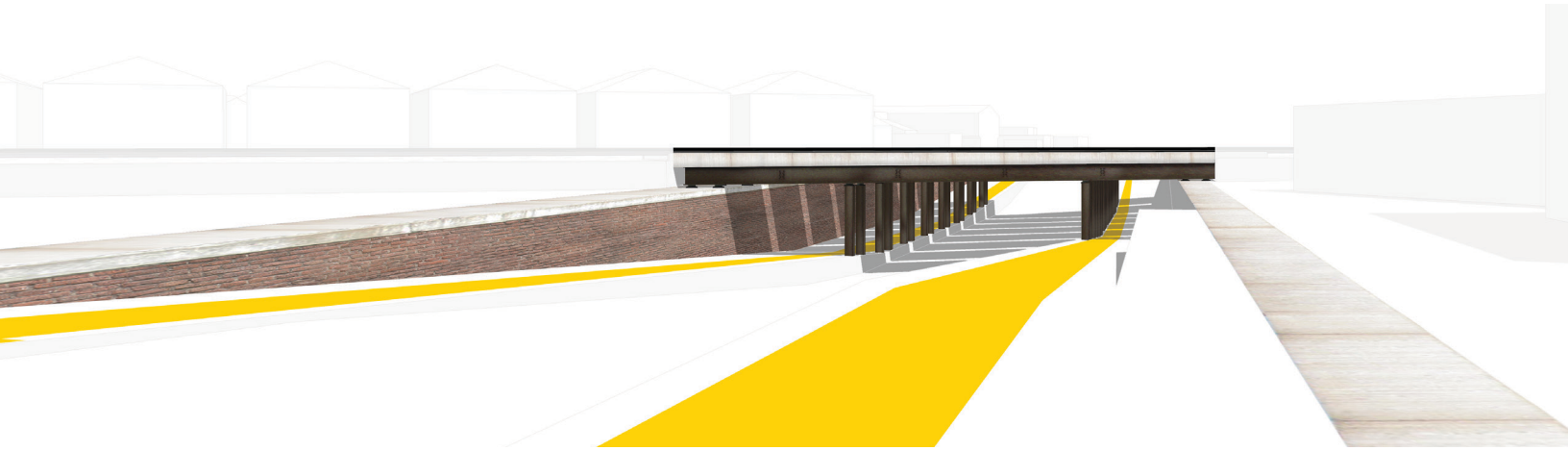
fig. 49. Geary Avenue

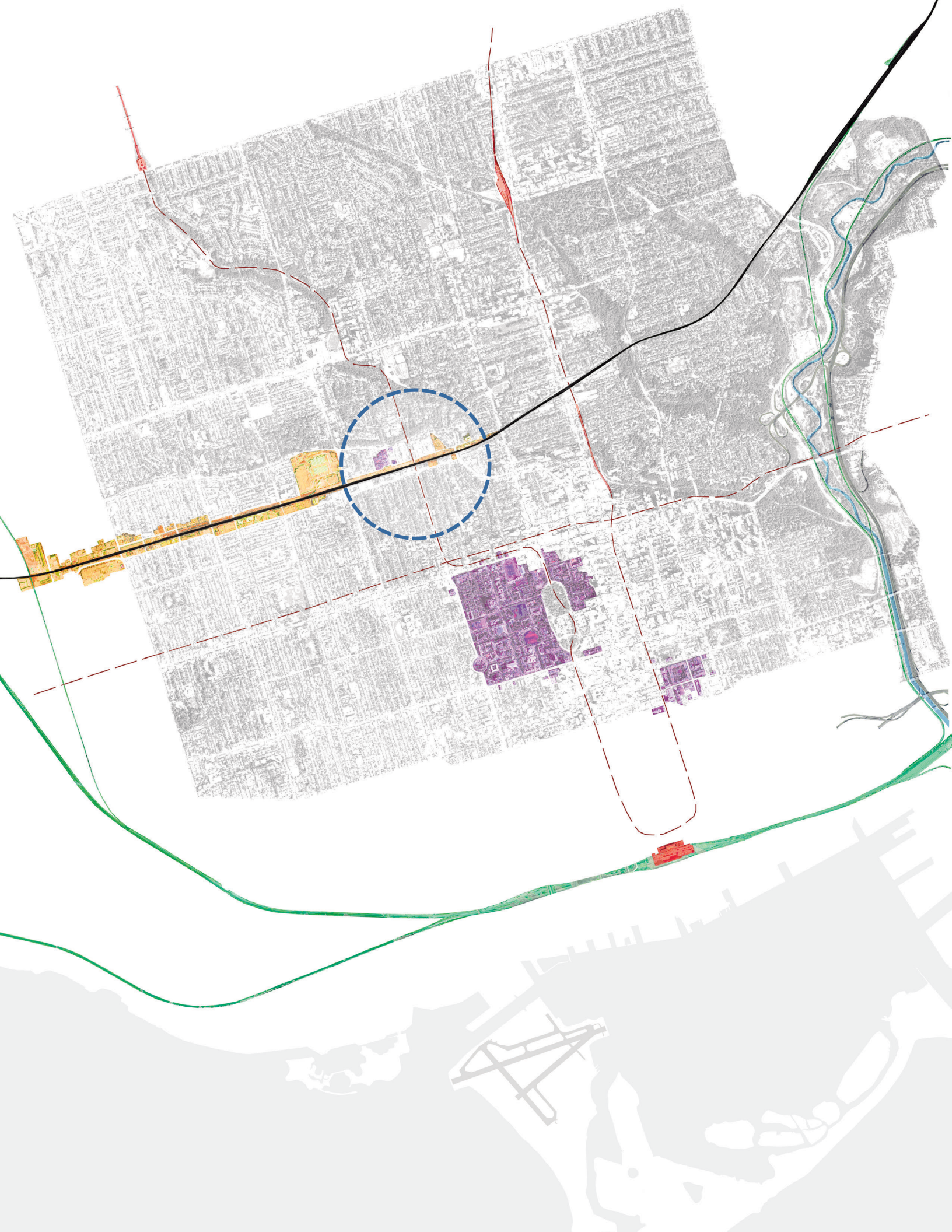
Passing trains loosen the soil, reawakening dormant seeds. The fertility of motion stimulating new growth.

beat had multiplied the tracks and split the ground at Dufferin Road, revealing courses of brick in the underpass, the supple texture of historic Toronto bearing the load of the city's new desire. The weight of the trains resonated in the steel beams as she cycled below the tracks, iron, speed, and distance reverberating around her.

Turning east on Geary Avenue, she made her way onto the bicycle path paralleling the railway. The rail lines pulled the city along their length, the engines racing by collecting the surrounding neighbourhoods into their wake. The thundering trains had loosened the soil and awoken a long dormant potential. The fabric of the city thickened and grew fertile, a renewed sense of mobility feeding the intensification of activity and construction. Buildings crowded each other just to gain access to the railway's speed.

As it passed Christie Street, the bicycle path skirted between electrical pylons and the TTC's Hillcrest Complex, electric and kinetic energy amplified. In less than ten minutes she had reached the station. The bicycle path slipped under the tracks and curled into the dense knot of transit.





Lake Iroquois Station

The key interchange of the new line, named Lake Iroquois Station after the former lake which covered much of Toronto after the end of the last ice age, feeds on an intense overlap of historic and contemporary infrastructures. Located at the intersection of Dupont and Spadina just south of the historic First Nations trading trail which traced the shoreline of Lake Iroquois, now named Davenport Road, the station gathers the primary midtown electrical corridor, extensions of the Bathurst and Spadina streetcar lines, the existing University-Spadina subway, and expansions of the city's cycling network and knots them together with regional passenger rail.

Industrial tracts line the rail corridor to the west, while the TTC's Hillcrest Yard remains a primary employment centre in the city. George Brown College's Casa Loma Campus is just steps away and the University of Toronto is a short subway or streetcar ride to the south. Other nearby attractions include Casa Loma, the Toronto Archives, and the Cedarvale Ravine Park.

The station draws on the high energy and tension of the electrical corridor, incorporating electri-

cal pylons into the building's structure and echoing their pinnacles and wires with cable-stayed roofs, leaving the primary public spaces (the platforms and the great hall) practically column-free. Peaked canopies at the east identify the station as a landmark but the main station roofs rise only gradually toward the north, maintaining sight-lines to Casa Loma's tower and accommodating the current lower-density neighbourhood to the south.

Freight trains continue to operate alongside the new passenger trains—two wide platforms give access to four tracks while two additional tracks run at the perimeter, permitting express and freight trains to pass through unimpeded. A bicycle path paralleling the rail line and piggybacking on its bridges continues through the station on an enclosed cantilever to the north, passing over Spadina for the convenience of crosstown cyclists.

An intense mix of programmes operates adjacent to and underneath the railway: at the west end, enclosed car (254 spaces, including allotment for carshare programs) and bicycle parking (552 spaces) provide a mix of personal transportation options. Immediately to the east of the bicycle

fig. 50. Lake Iroquois Station Context

The key interchange of the new line, Lake Iroquois Station, is located at the intersection of the CPR corridor, Davenport Road, and the University/Spadina Subway (highlighted in the dashed blue circle). Industrial lands (yellow), including the TTC's Hillcrest Yard, line the rail corridor to the west. Major centres of higher education (purple) are nearby including George Brown College's Casa Loma Campus and the University of Toronto to the south.

The station provides a midtown counterpoint to Union Station (red) alleviating the existing, heavily used regional rail lines (bright green) which funnel commuters into the downtown. Nearby attractions include Casa Loma, the Toronto Archives, and the Cedarvale Ravine Park.



fig. 51. Lake Iroquois Station

Subways, streetcars, buses, and regional trains overlap and cross paths at the new station, propelling passengers in all directions across the city.

parking is a bicycle shop with repair-stands and tools available for public use. Between the tracks and lower parking is a fitness centre and juice bar. Concourses to both the west and east of Spadina include large openings to the TTC concourse below openings at the stairways and escalators to the tracks above aid navigation and intensify interactions between the overlapping activities.

The head house at the southeast includes a café, convenience store, flower shop, dry cleaner, ticket counters, and luggage storage. One level up is an LCBO and passenger lounge. At the highest level of the head house is a restaurant sitting slightly above track level peering over the trains as they arrive and depart.

To the northeast on the main level of the station are bus platforms sheltered by the cantilever above. Both the Spadina and Bathurst streetcar routes are drawn into the station (Bathurst burrowing under the bicycle path at the west end of the station and Spadina arriving underground beneath Madison Avenue). Even further below, the station connects to Dupont Station on the University-Spadina subway line.

Roof and Electrical Lines

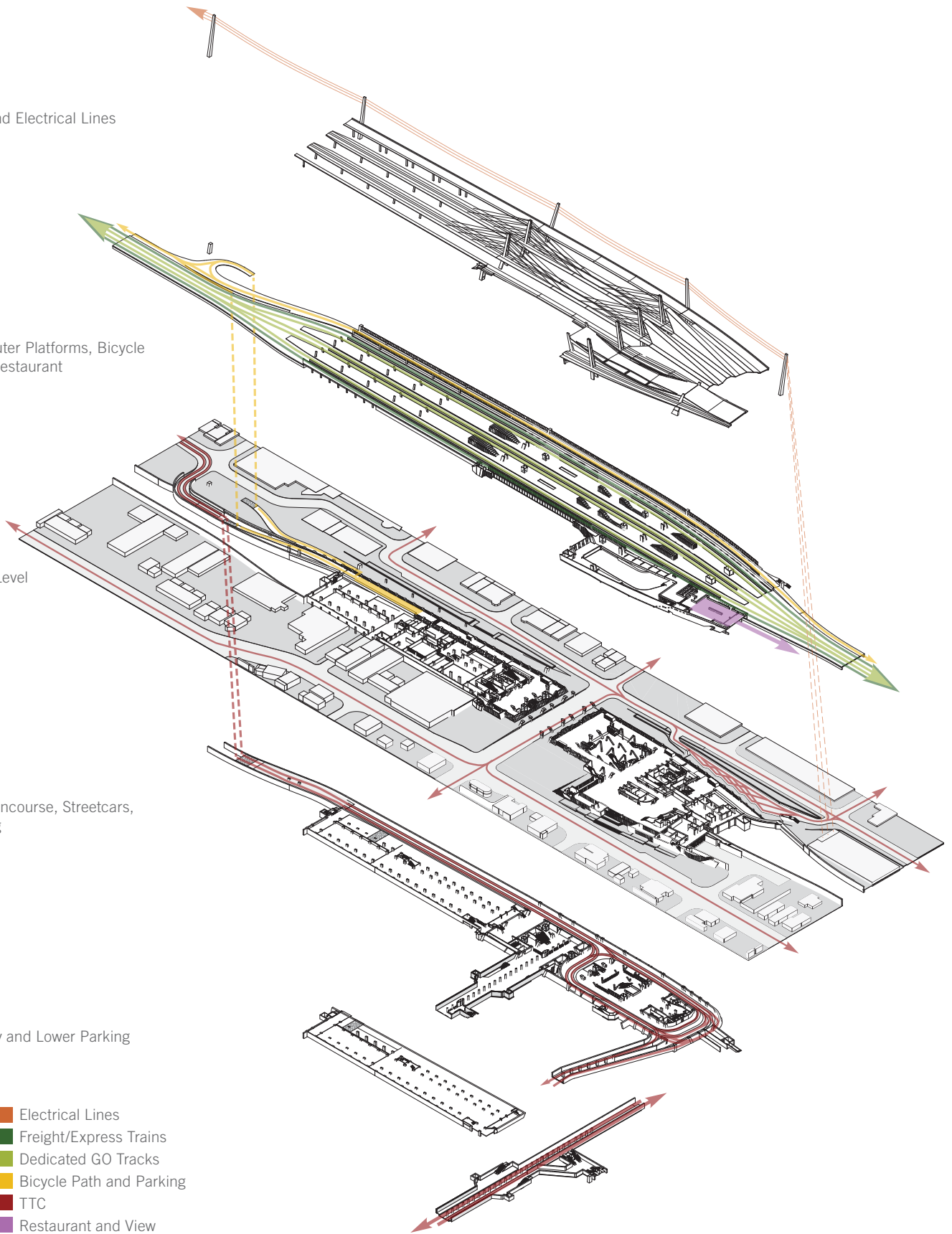
Commuter Platforms, Bicycle Path, Restaurant

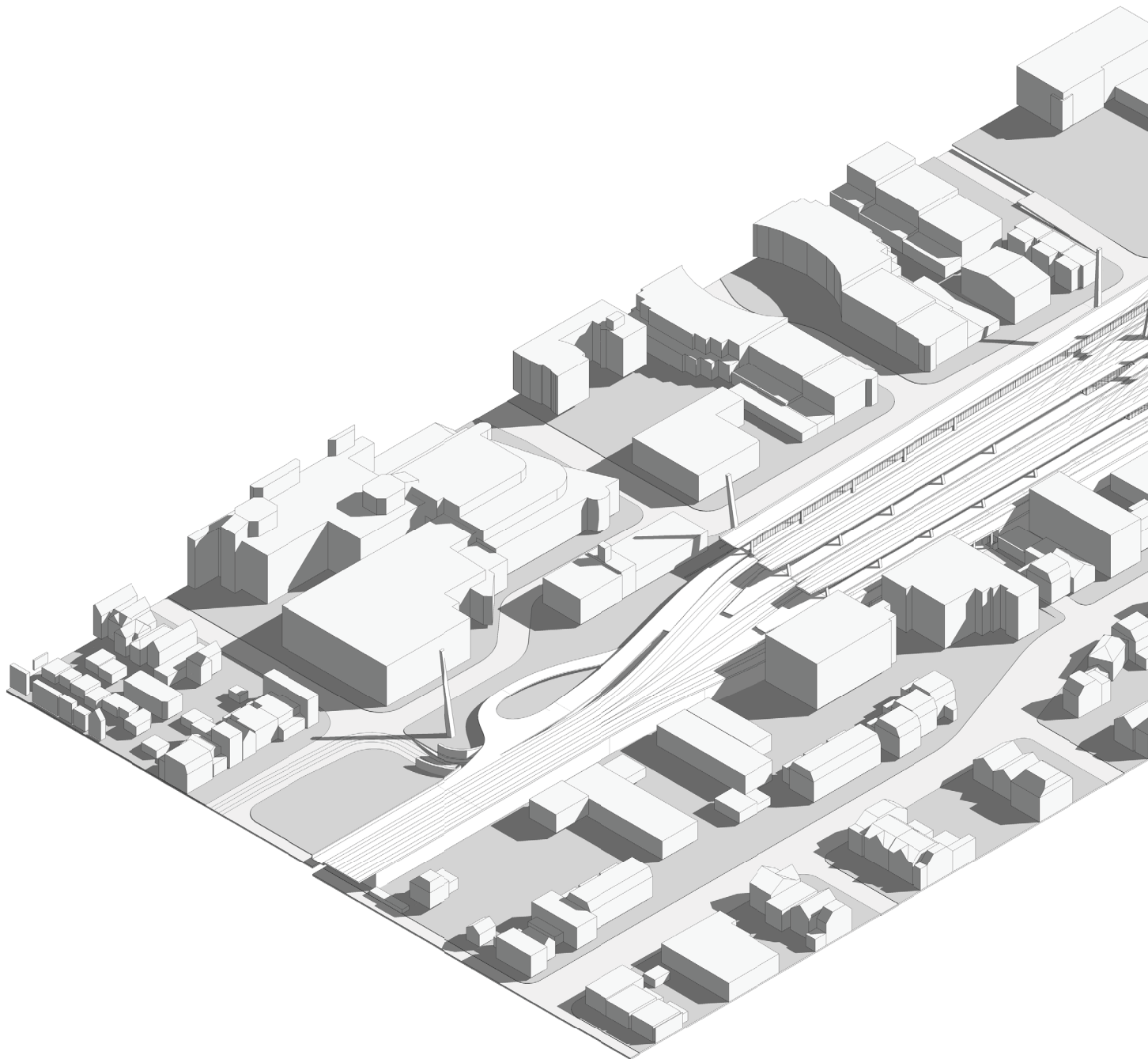
Street Level

TTC Concourse, Streetcars, Parking

Subway and Lower Parking

- Electrical Lines
- Freight/Express Trains
- Dedicated GO Tracks
- Bicycle Path and Parking
- TTC
- Restaurant and View





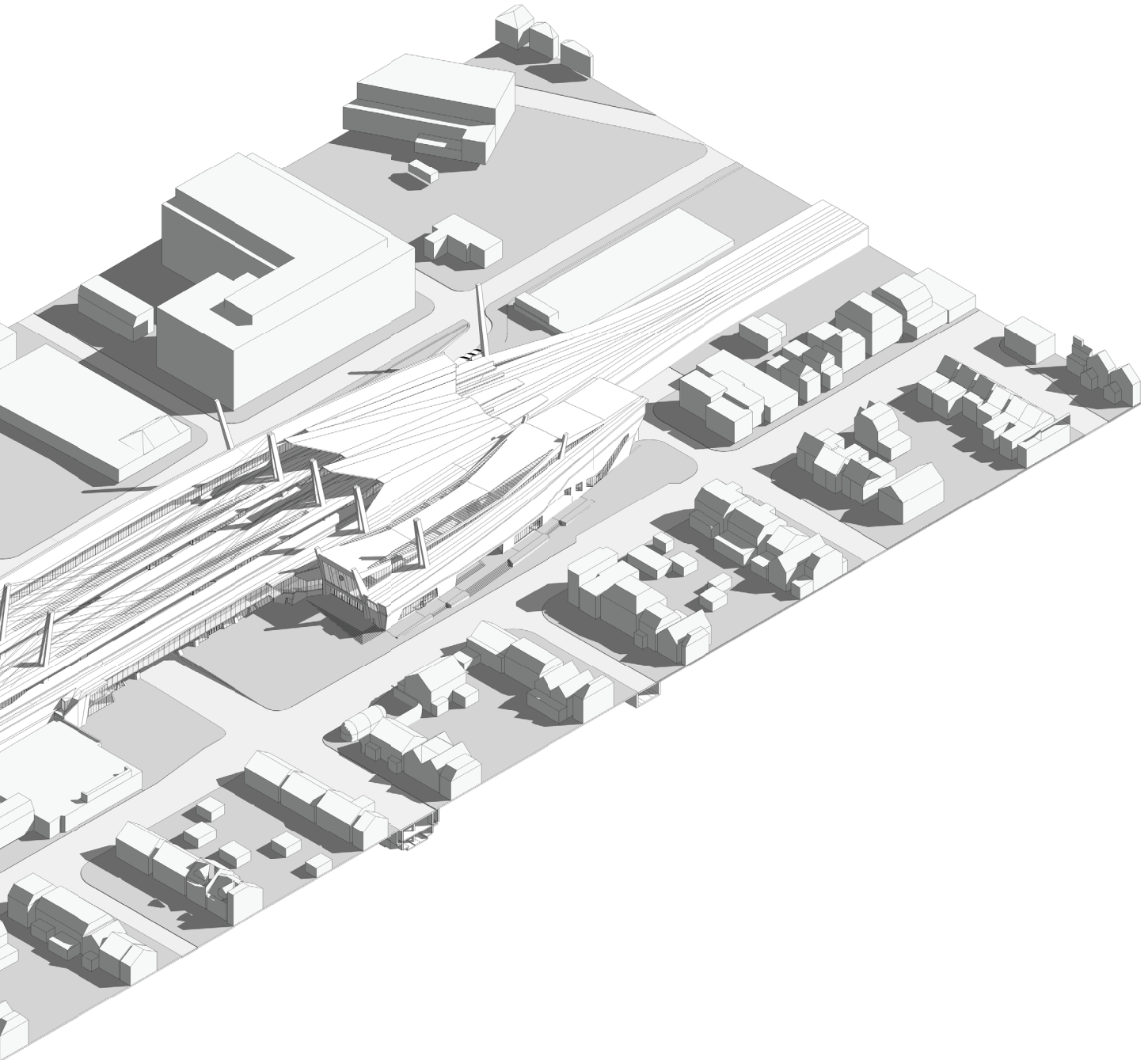


fig. 52. Lake Iroquois Station SW Isometric



Casa Loma

Lyndhurst Court

Wainmer Road

Davenport Road

← to Tollkeeper's Park

Davenport Road

Wainmer Road

Kendal Avenue

George Brown College

Bridgman Avenue

Darnell Avenue

Howland Avenue

← to Bathurst Street and TTC Hillcrest Facilities

Dupont Street

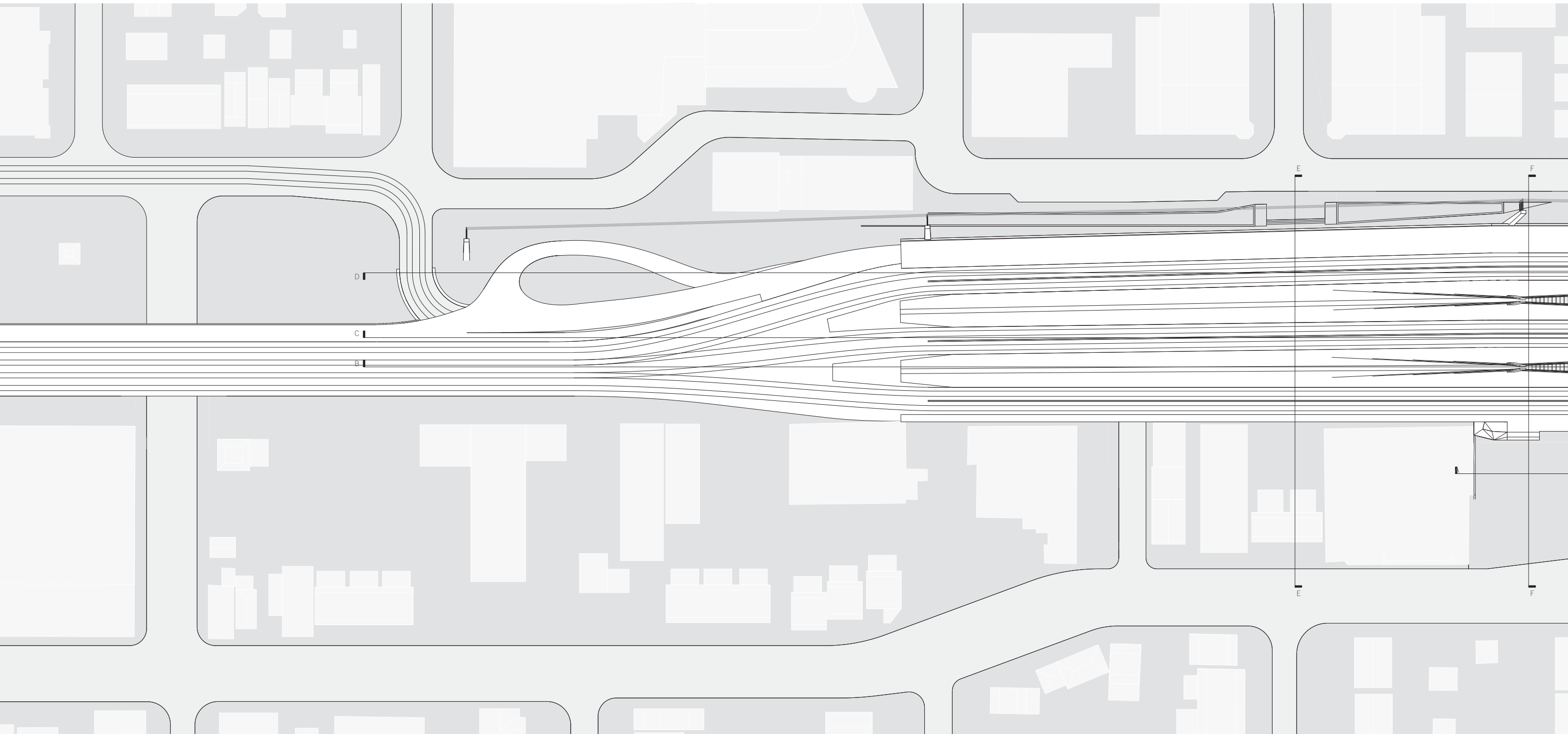
Brunswick Avenue

Kendal Avenue

Howland Avenue



N
fig. 53. Site Plan
Scale: 1 : 2000



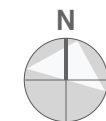
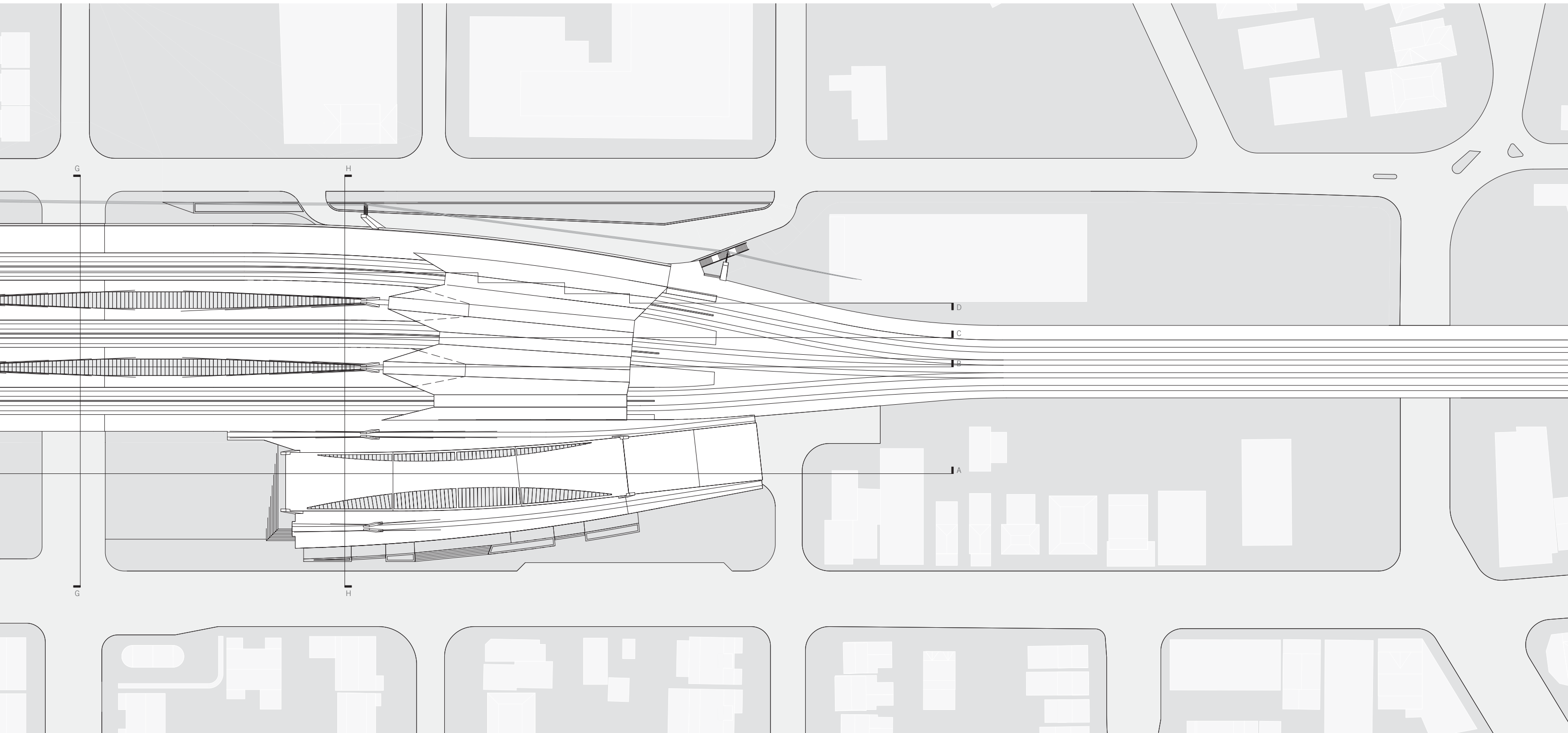
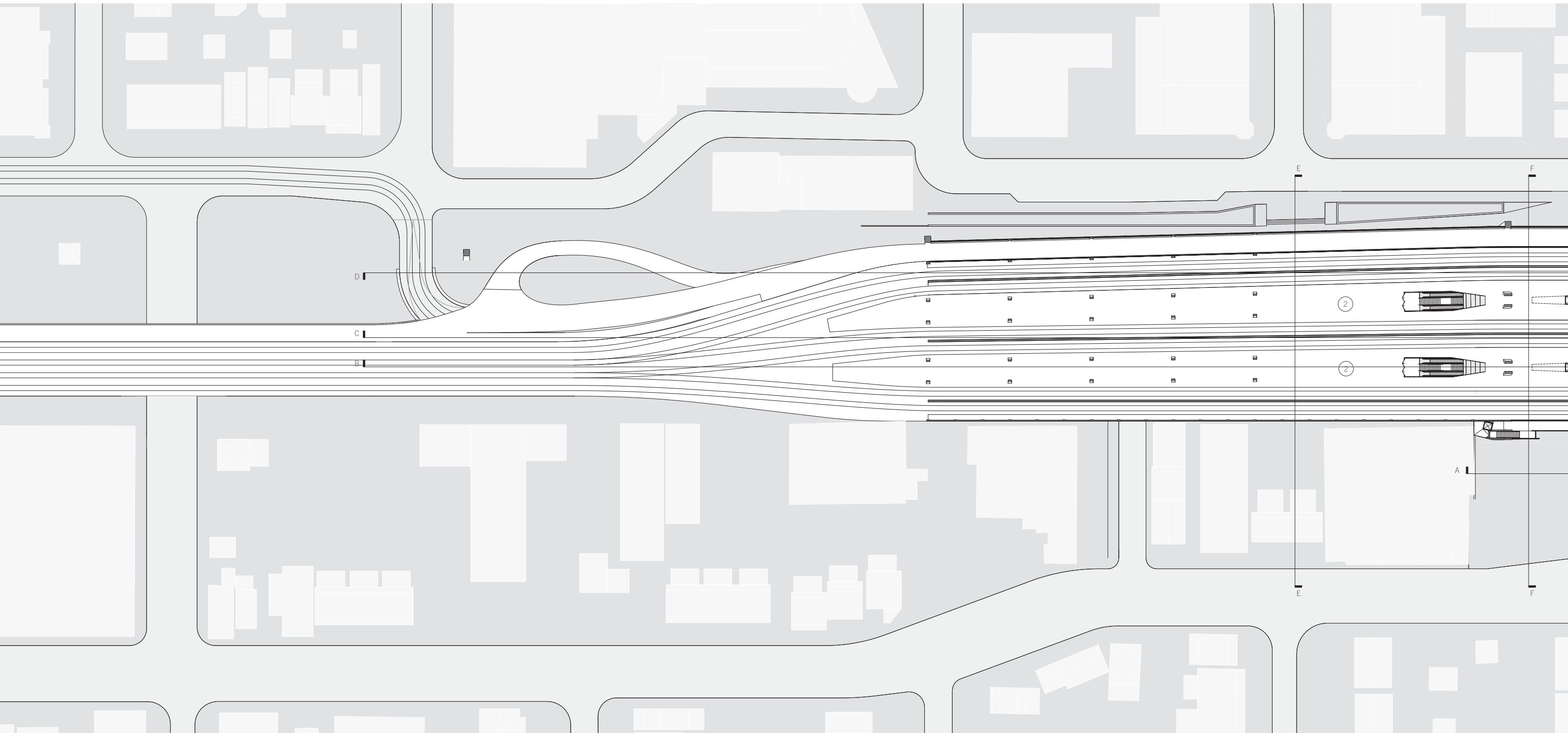


fig. 54. Roof Plan
Level: Roof +11.0m to +24.6m
Scale: 1 : 1000



- | | | | | | | | |
|-------------------|-----------------------------|-------------------------|-----------------------|----------------------|---------------------|----------------------------|----------------------------------|
| 1 Bicycle Path | 7 Public Bicycle Repair | 13 Fitness Studio | 19 Waiting Room | 25 Flowers | 31 Bus Concourse | 37 Hair Dresser | 43 Men's Change Room |
| 2 Platforms | 8 Bicycle Shop | 14 Fitness Equipment | 20 East Concourse | 26 Convenience Store | 32 Bus Platforms | 38 LCBO | 44 Women's Change Room |
| 3 South Walkway | 9 Juice Bar | 15 Train Ticket Offices | 21 Lottery and Snacks | 27 Dry Cleaner's | 33 LCBO Entrance | 39 Generators/Transformers | 45 Physio-Therapy Facilities |
| 4 Restaurant | 10 Fitness Centre Reception | 16 Men's Washrooms | 22 Retail | 28 Left Luggage | 34 Media Lounge | 40 Subway Concourse | 46 Southbound Platform |
| 5 Bicycle Parking | 11 Loading Dock | 17 Women's Washrooms | 23 Station Security | 29 Luggage Storage | 35 Bar | 41 Streetcar Concourse | 47 Northbound Platform |
| 6 Car Parking | 12 Back of House | 18 West Concourse | 24 Cafe | 30 TTC Tickets | 36 Passenger Lounge | 42 TTC Back of House | 48 Subway-to-Streetcar Crossover |

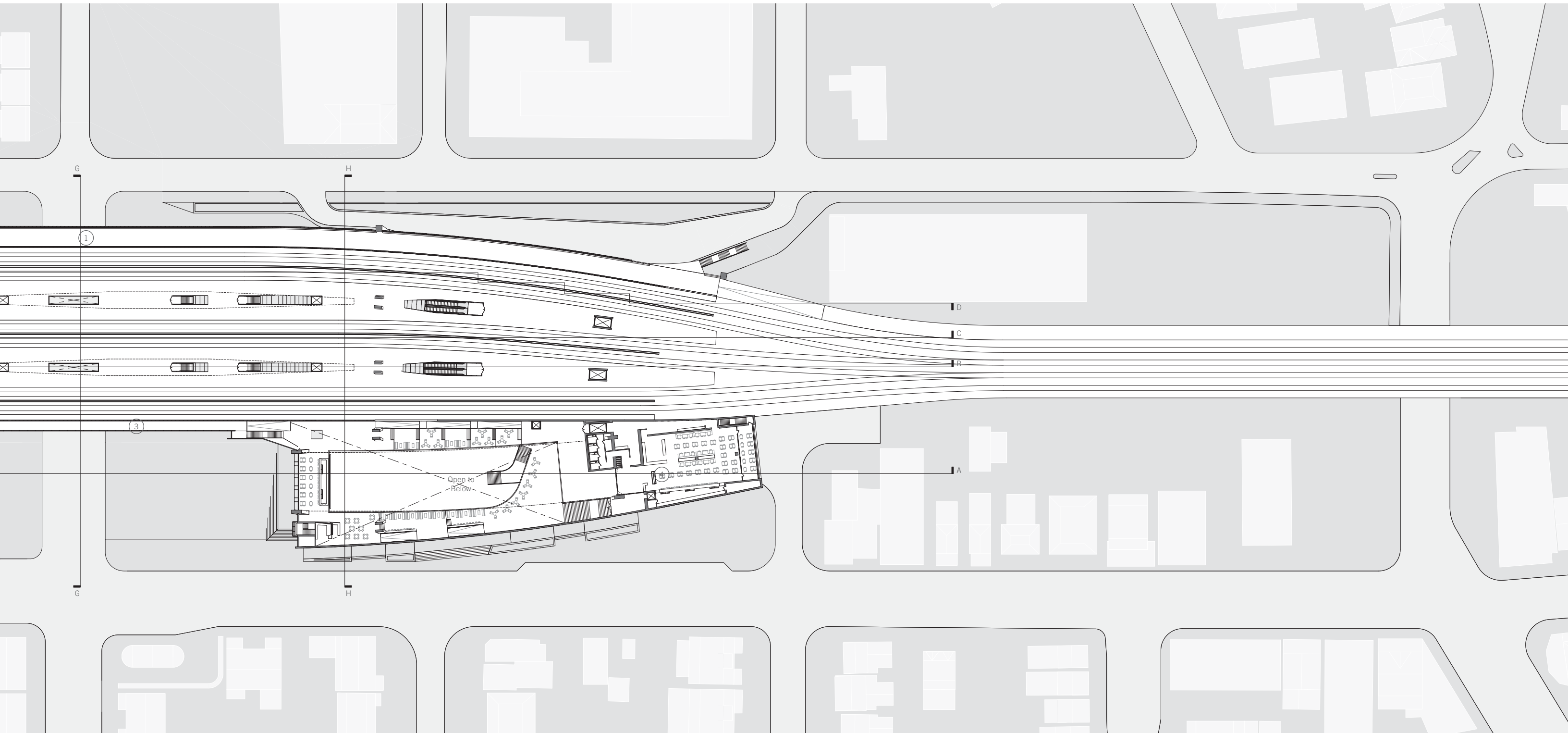
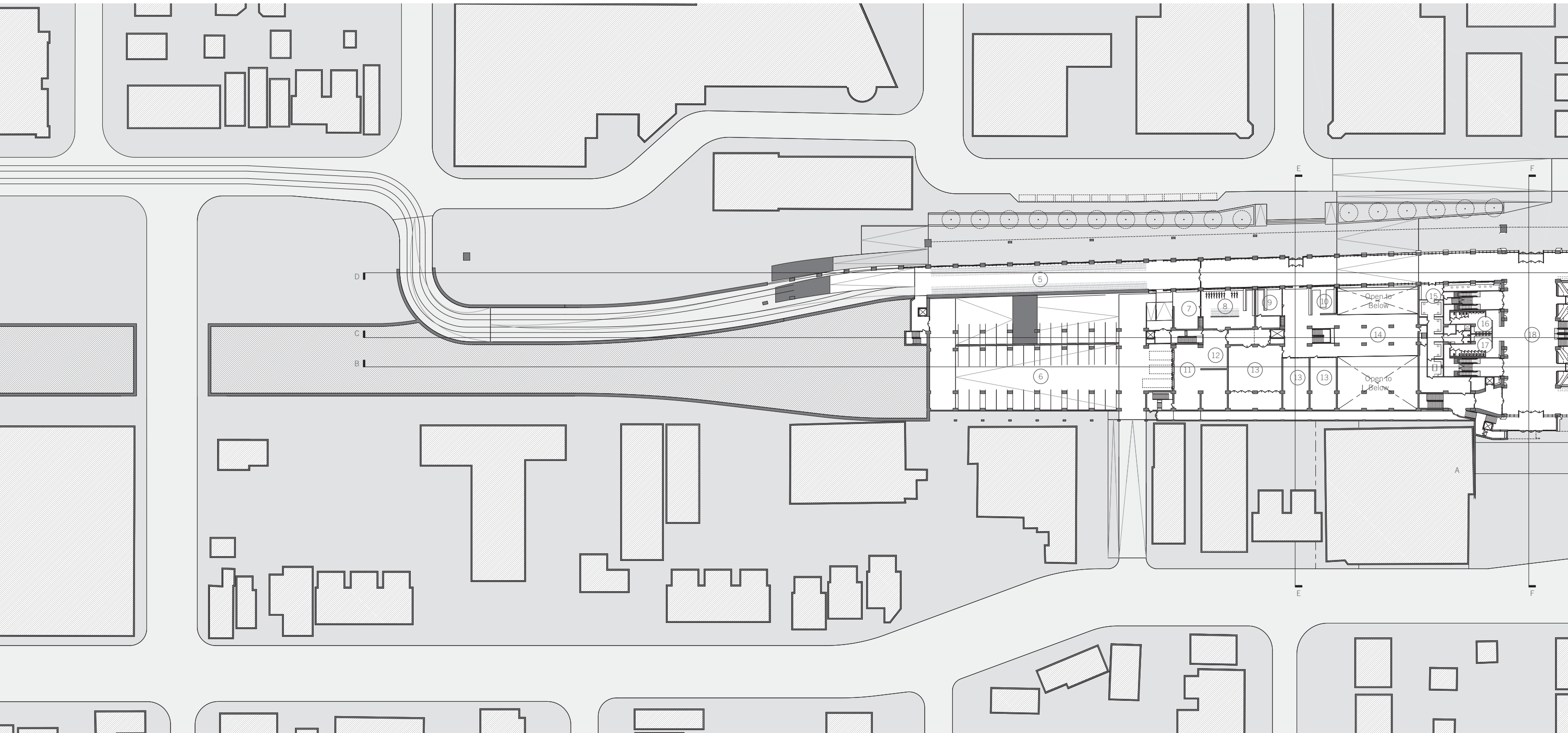


fig. 55. Platform Plan
Level: Platforms +6.6m

Scale: 1 : 1000



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|-------------------|-----------------------------|-------------------------|-----------------------|----------------------|---------------------|----------------------------|----------------------------------|
| 1 Bicycle Path | 7 Public Bicycle Repair | 13 Fitness Studio | 19 Waiting Room | 25 Flowers | 31 Bus Concourse | 37 Hair Dresser | 43 Men's Change Room |
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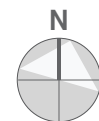
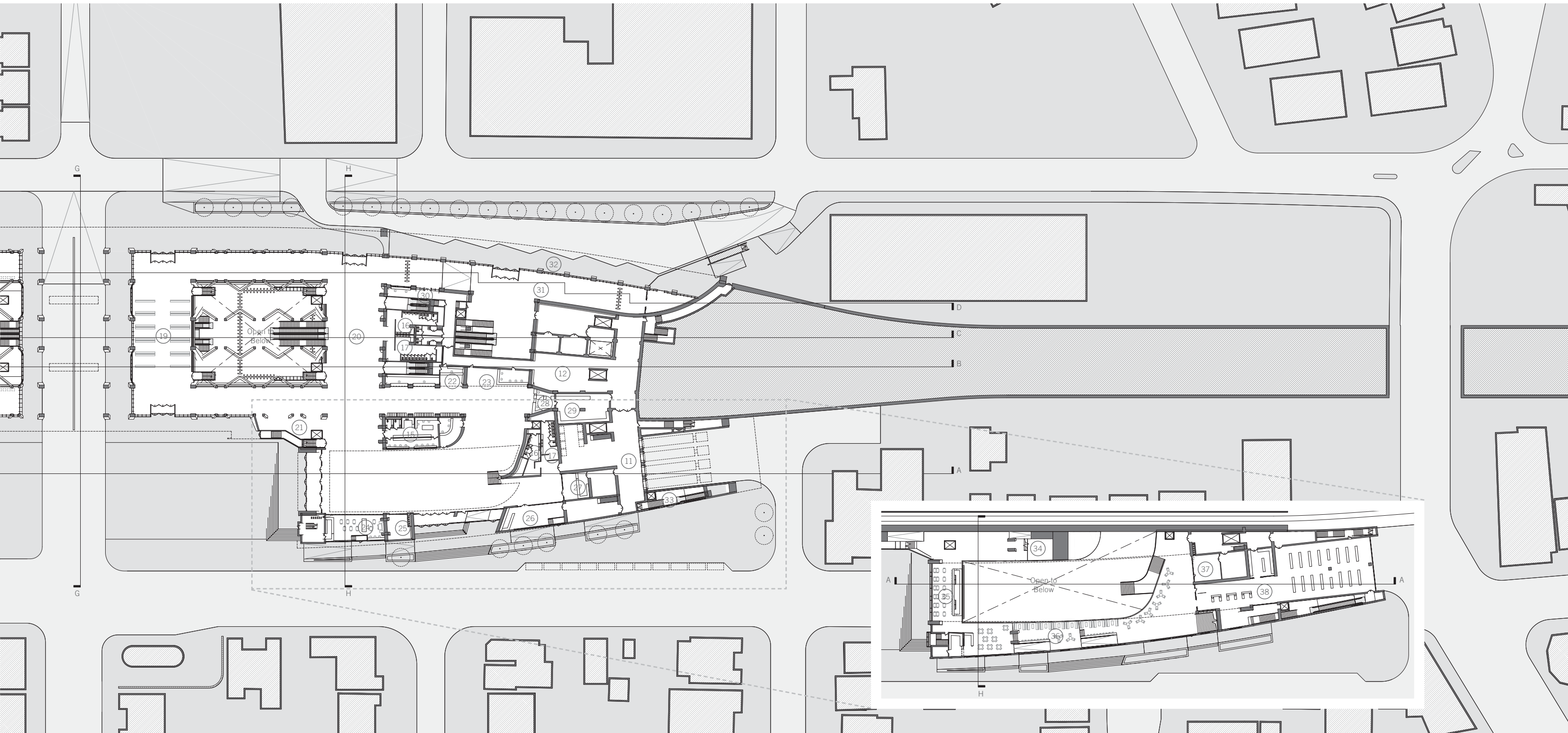
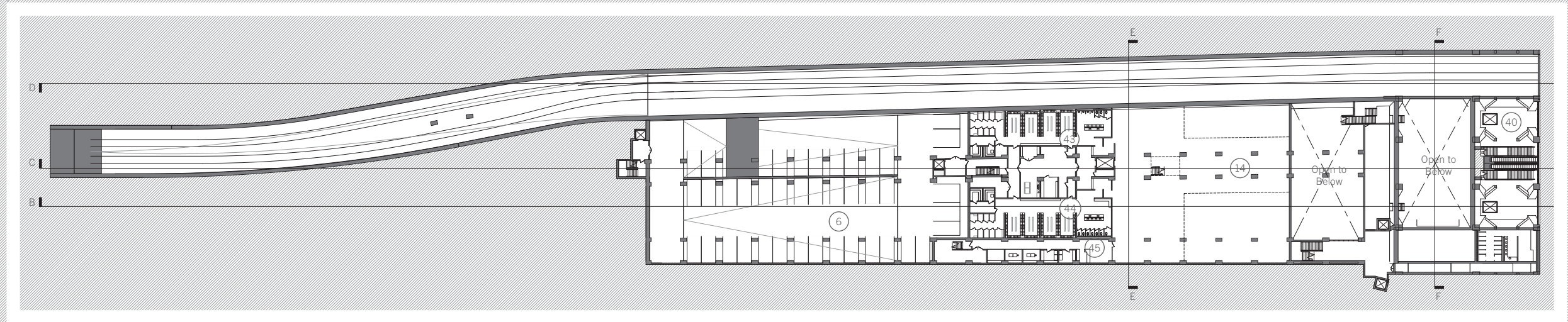
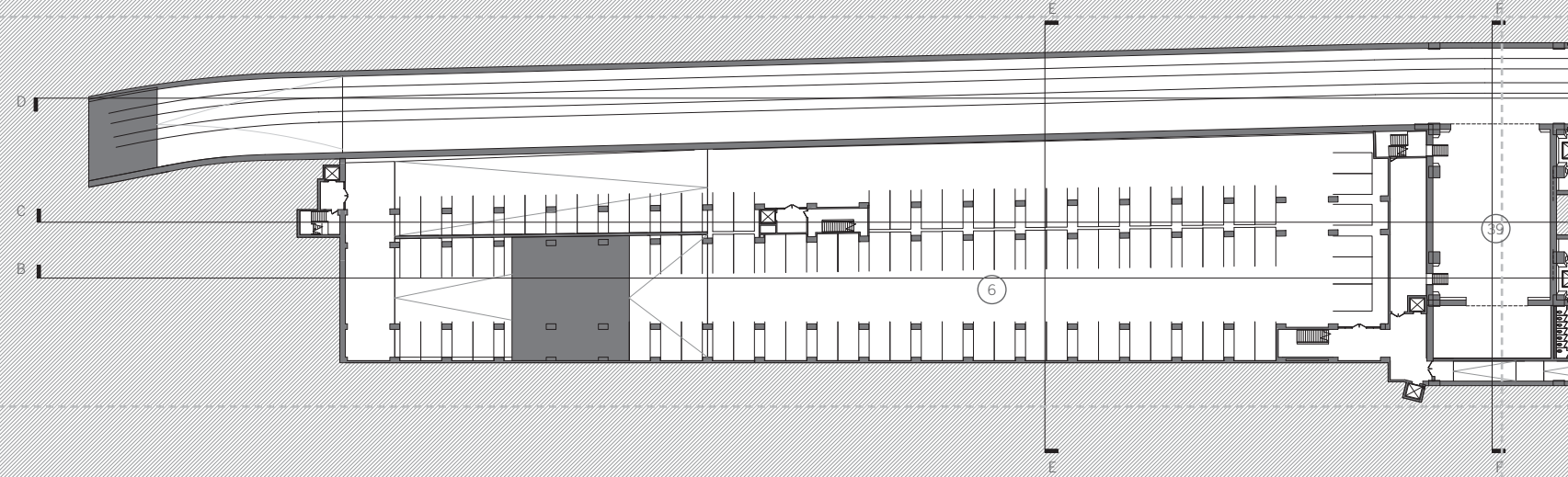


fig. 56. Concourse and Lounge Plan
Level: Concourse +0.0 ; Lounge +4.5m

Scale: 1 : 1000



- | | | | | | | | |
|-------------------|-----------------------------|-------------------------|-----------------------|----------------------|---------------------|----------------------------|----------------------------------|
| 1 Bicycle Path | 7 Public Bicycle Repair | 13 Fitness Studio | 19 Waiting Room | 25 Flowers | 31 Bus Concourse | 37 Hair Dresser | 43 Men's Change Room |
| 2 Platforms | 8 Bicycle Shop | 14 Fitness Equipment | 20 East Concourse | 26 Convenience Store | 32 Bus Platforms | 38 LCBO | 44 Women's Change Room |
| 3 South Walkway | 9 Juice Bar | 15 Train Ticket Offices | 21 Lottery and Snacks | 27 Dry Cleaner's | 33 LCBO Entrance | 39 Generators/Transformers | 45 Physio-Therapy Facilities |
| 4 Restaurant | 10 Fitness Centre Reception | 16 Men's Washrooms | 22 Retail | 28 Left Luggage | 34 Media Lounge | 40 Subway Concourse | 46 Southbound Platform |
| 5 Bicycle Parking | 11 Loading Dock | 17 Women's Washrooms | 23 Station Security | 29 Luggage Storage | 35 Bar | 41 Streetcar Concourse | 47 Northbound Platform |
| 6 Car Parking | 12 Back of House | 18 West Concourse | 24 Cafe | 30 TTC Tickets | 36 Passenger Lounge | 42 TTC Back of House | 48 Subway-to-Streetcar Crossover |

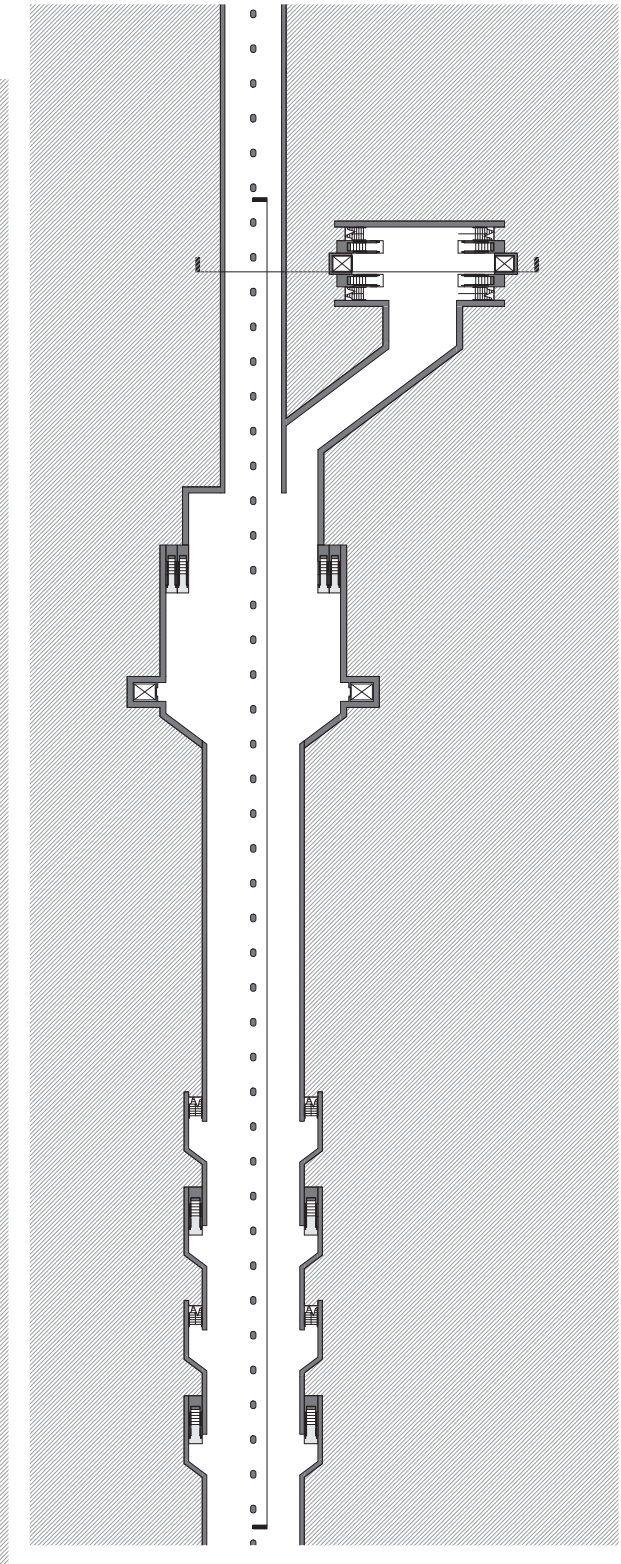
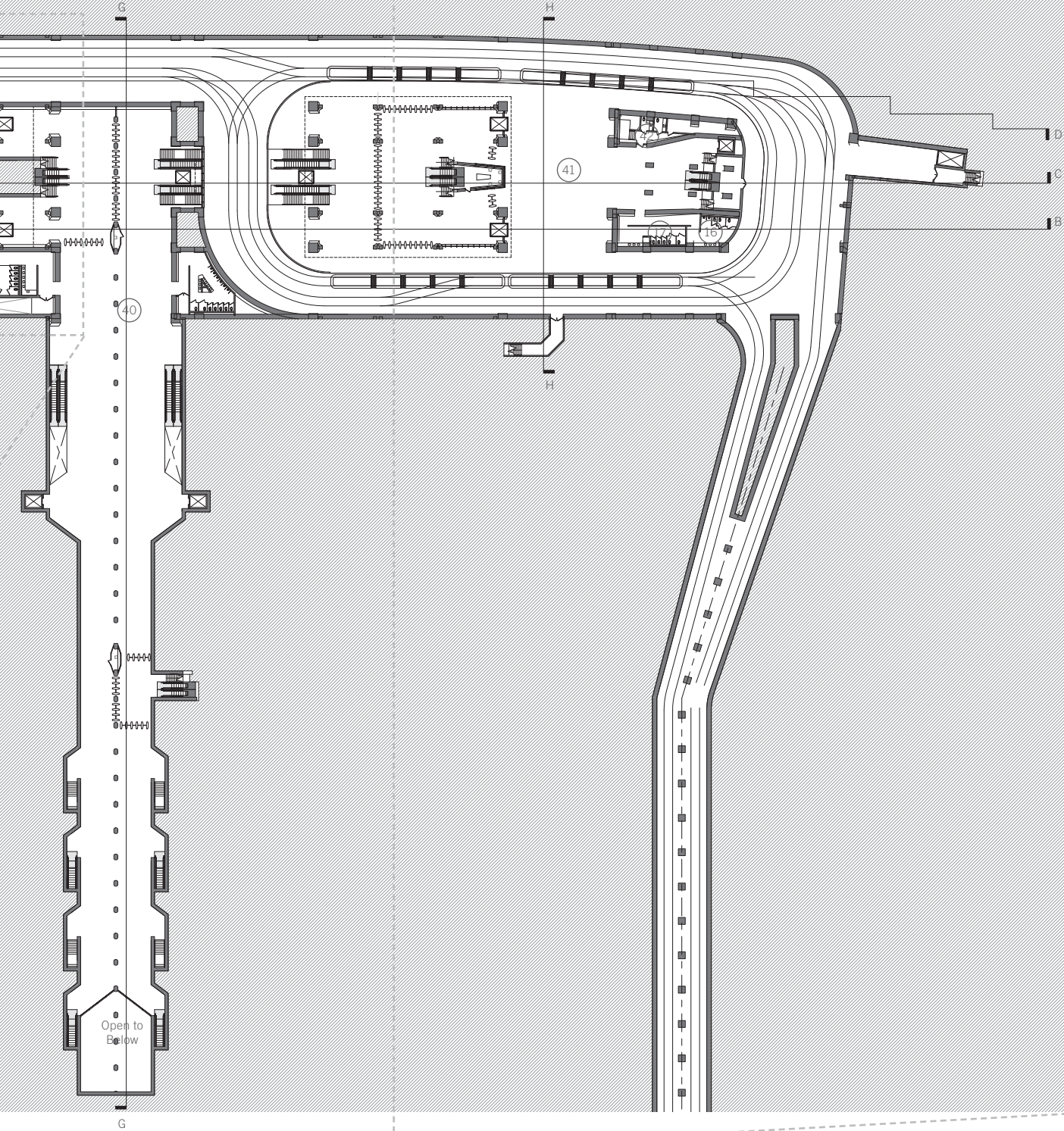
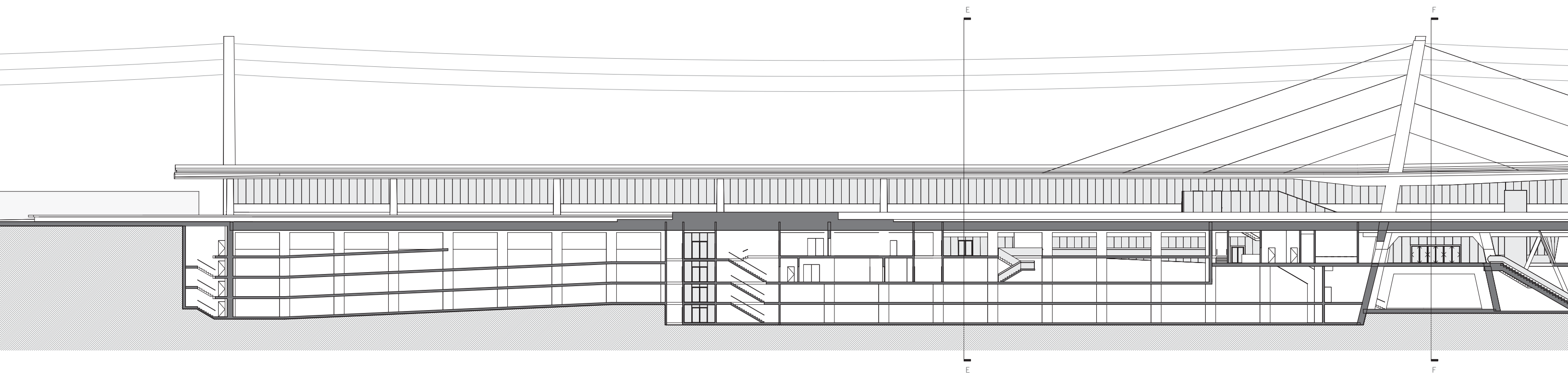
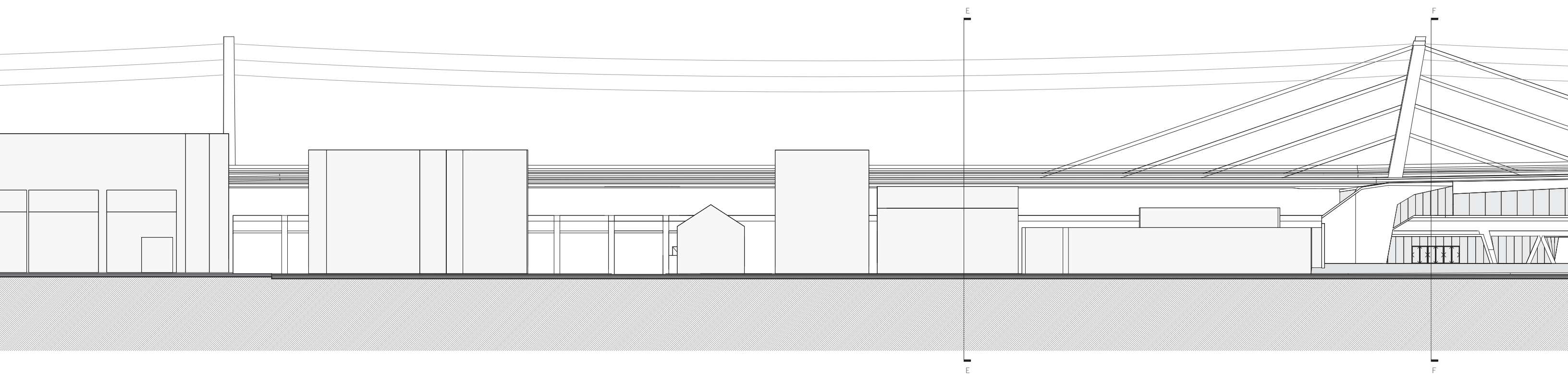


fig. 57. Streetcars, Subway, and Fitness Plan
Level: Streetcars -6.2m ; Subway -10.0m
Fitness -3.0m
Scale: 1 : 1000



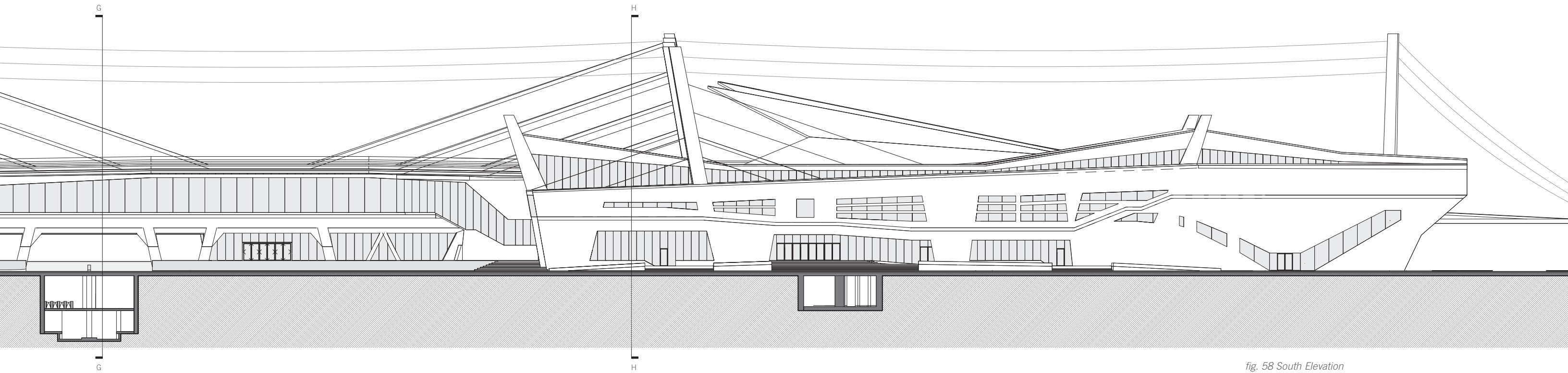


fig. 58 South Elevation
Scale: 1 : 500

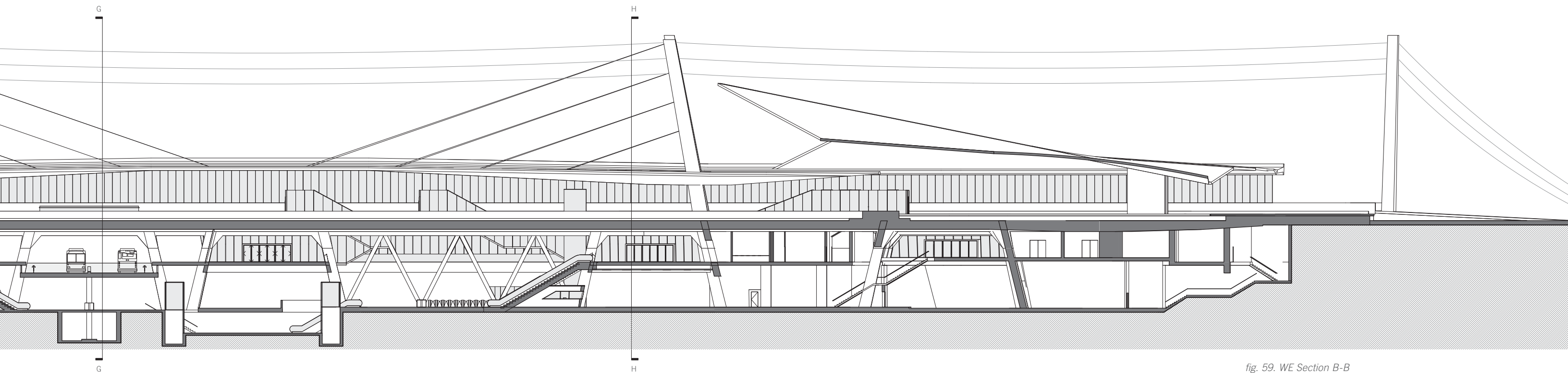
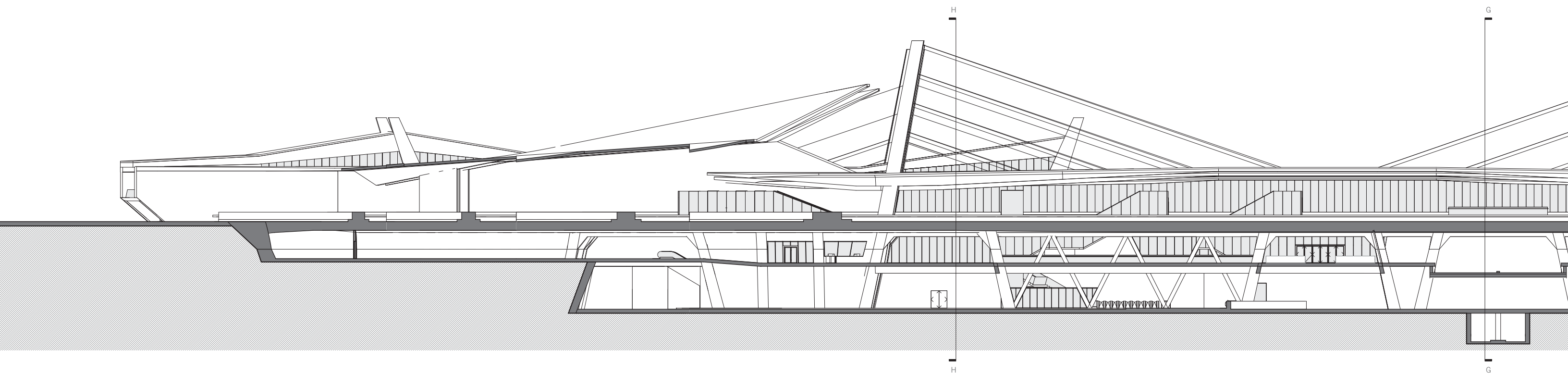
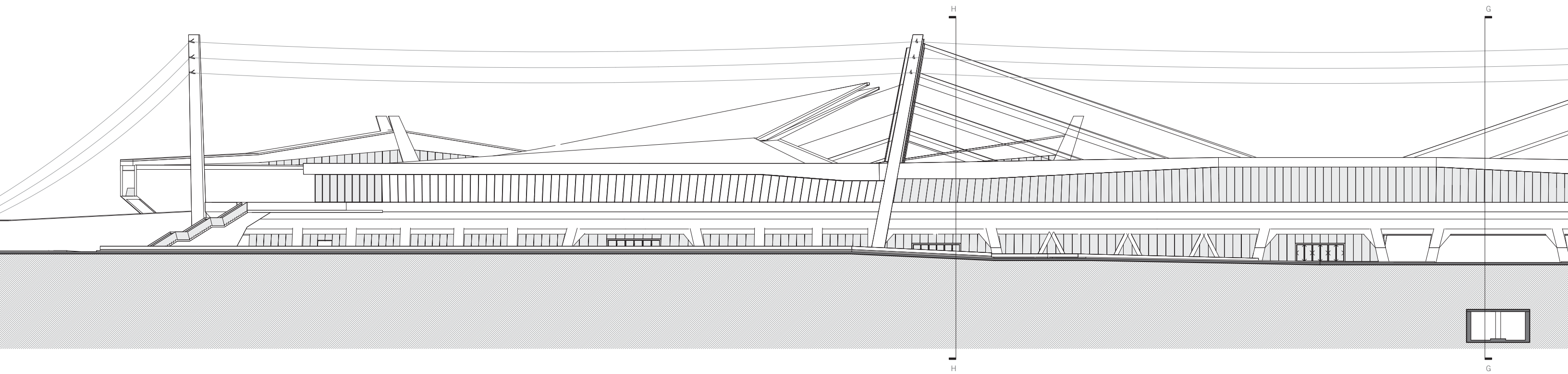


fig. 59. WE Section B-B
Scale: 1 : 500



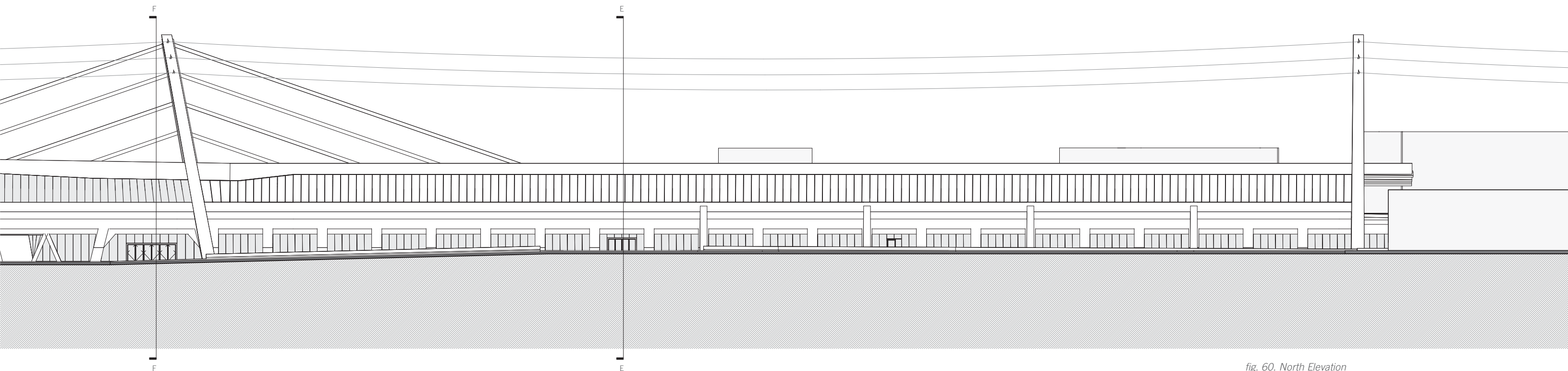


fig. 60. North Elevation
Scale: 1 : 500

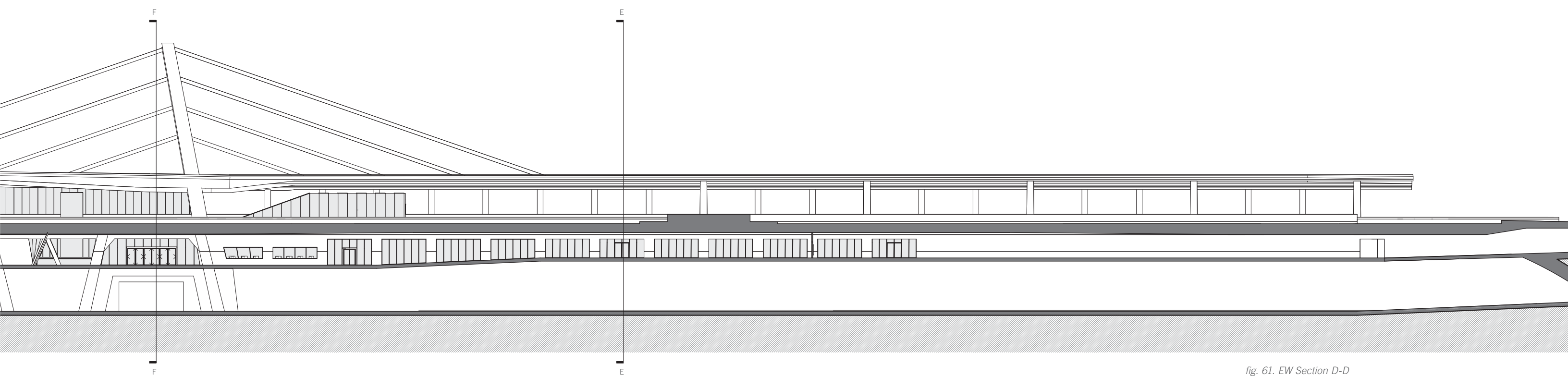


fig. 61. EW Section D-D
Scale: 1 : 500

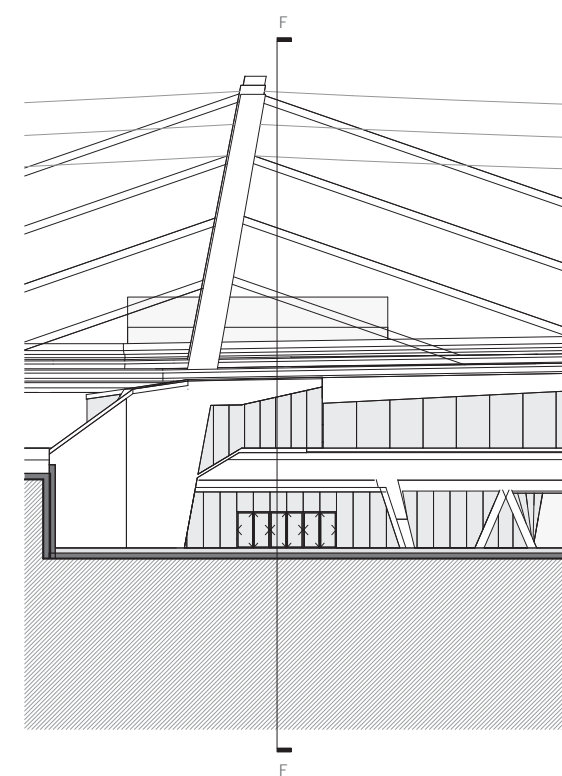
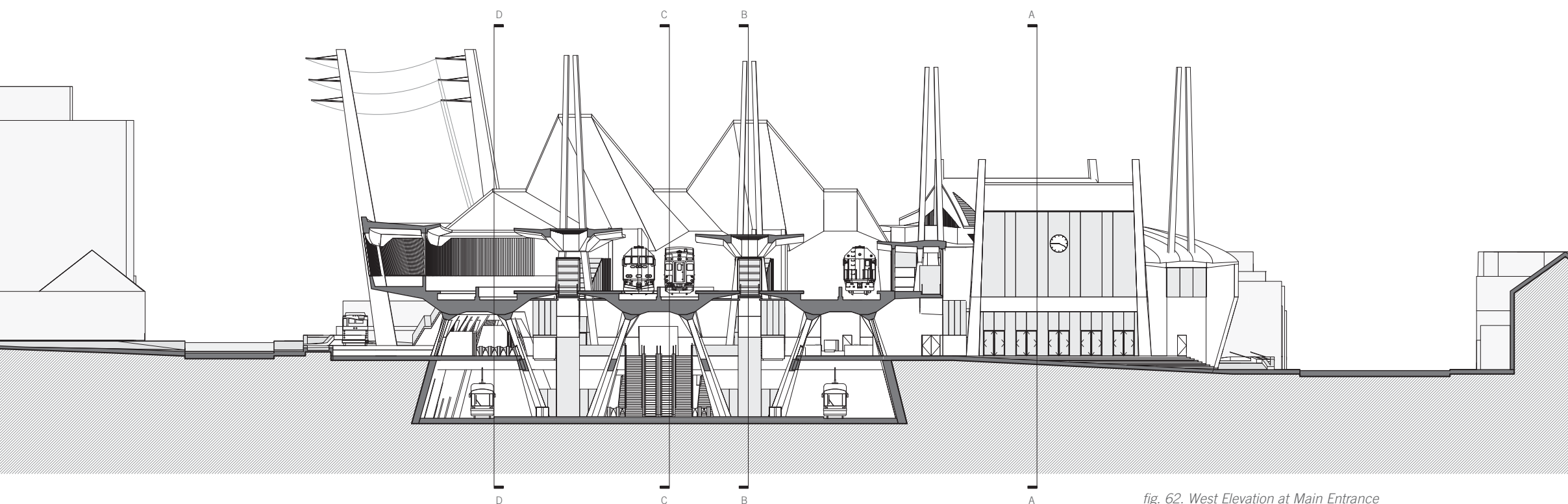
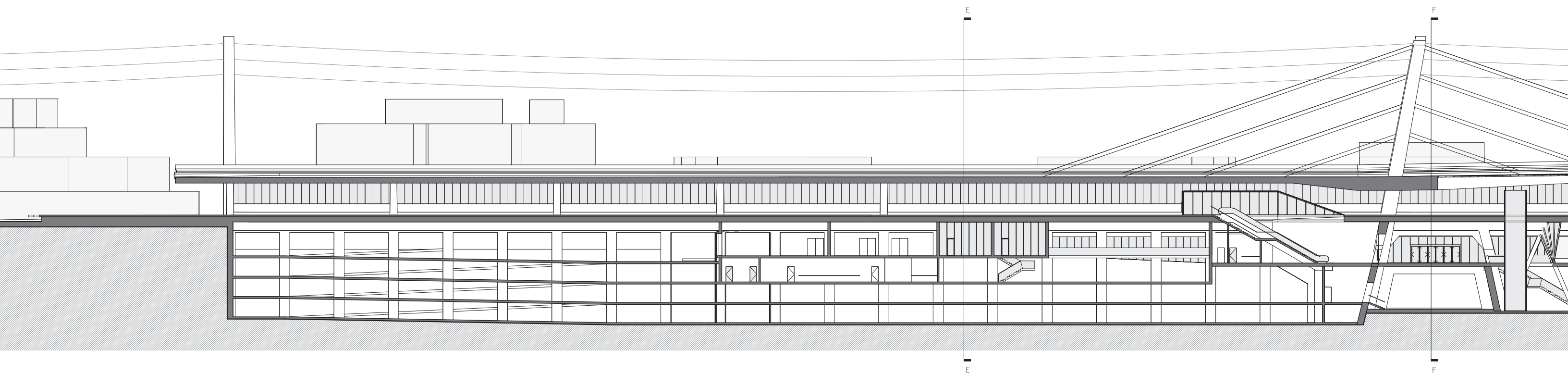


fig. 62. West Elevation at Main Entrance
Scale: 1 : 500



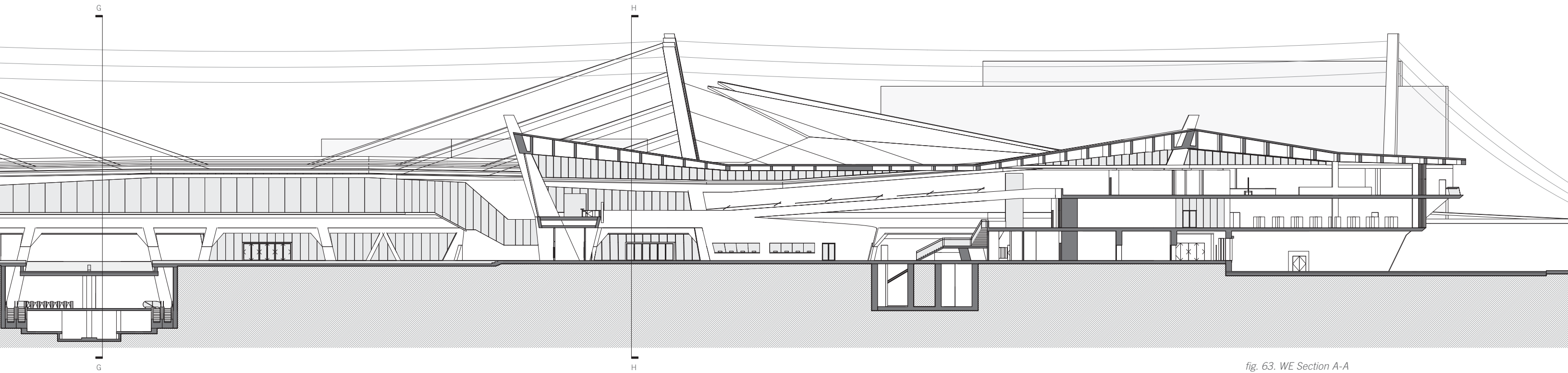


fig. 63. WE Section A-A
Scale: 1 : 500

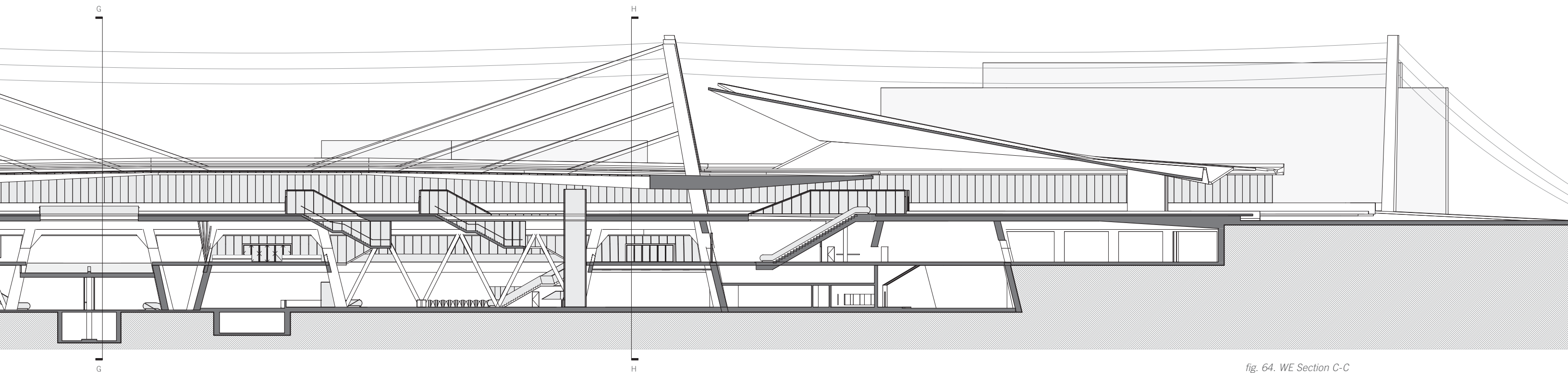


fig. 64. WE Section C-C
Scale: 1 : 500

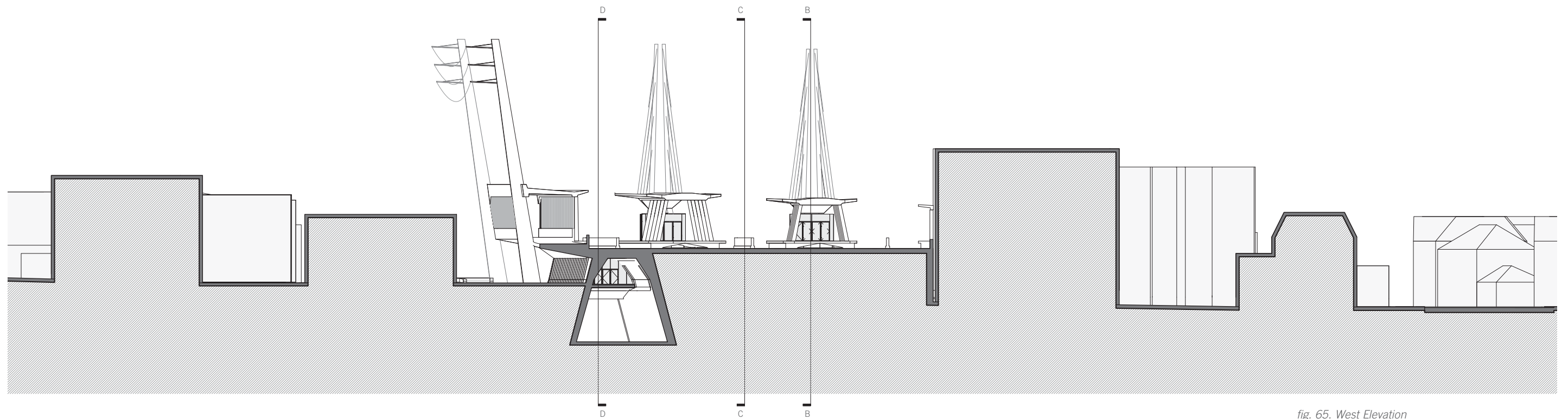


fig. 65. West Elevation
Scale: 1 : 500

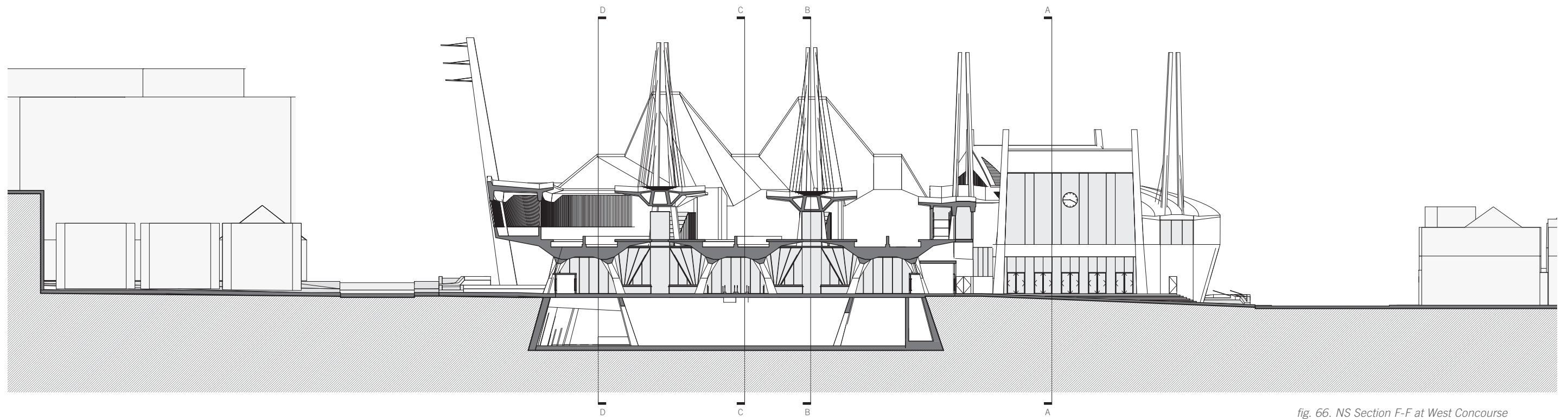


fig. 66. NS Section F-F at West Concourse
Scale: 1 : 500

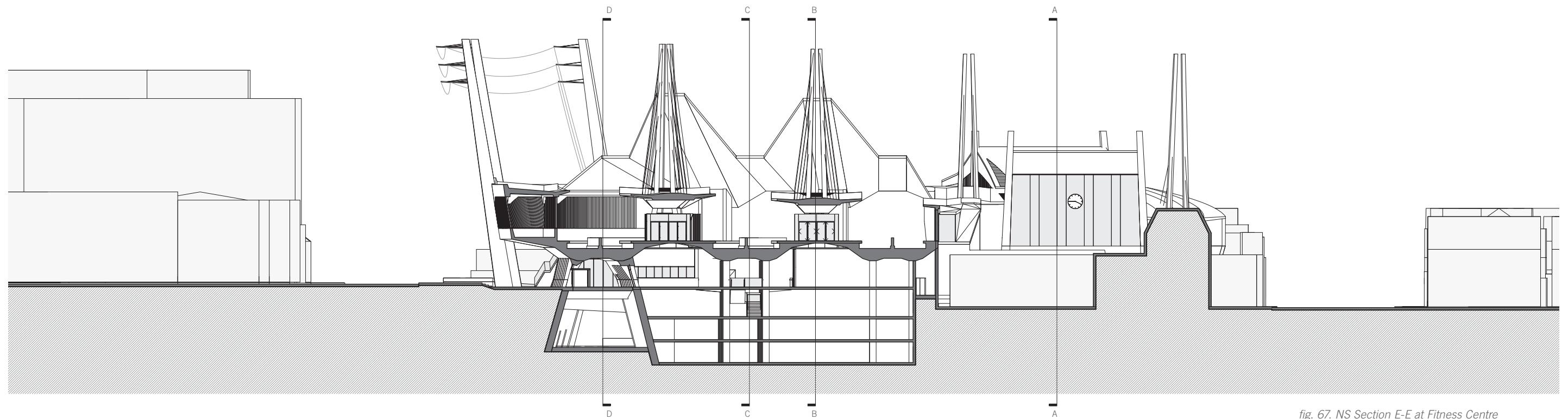


fig. 67. NS Section E-E at Fitness Centre
Scale: 1 : 500

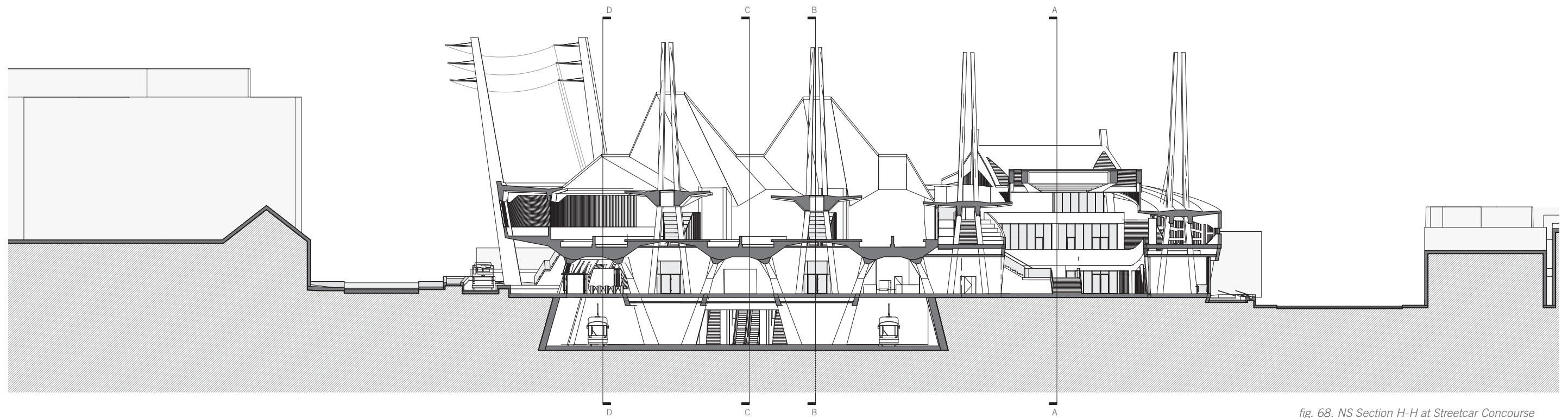


fig. 68. NS Section H-H at Streetcar Concourse
Scale: 1 : 500

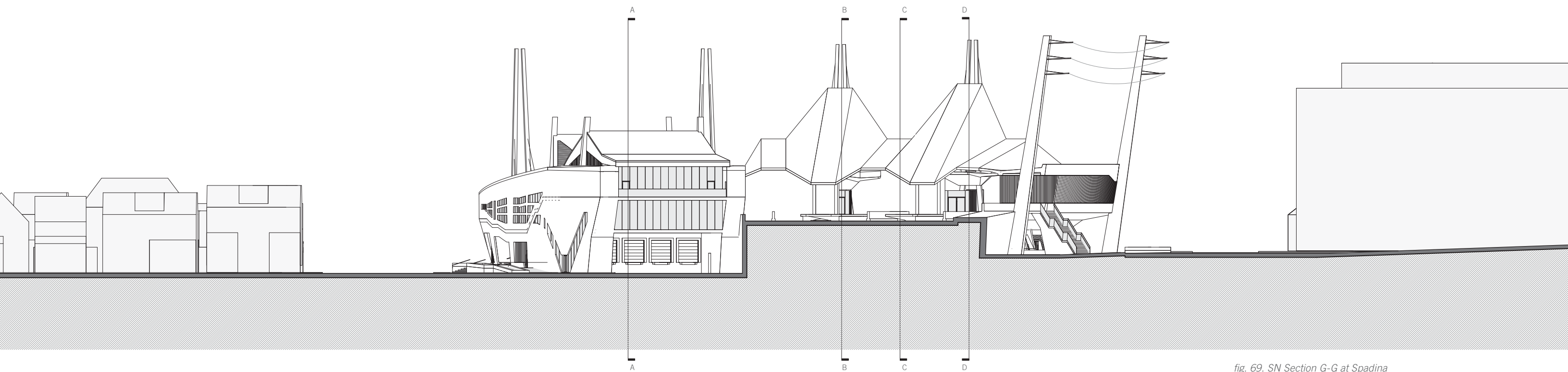


fig. 69. SN Section G-G at Spadina
Scale: 1 : 500

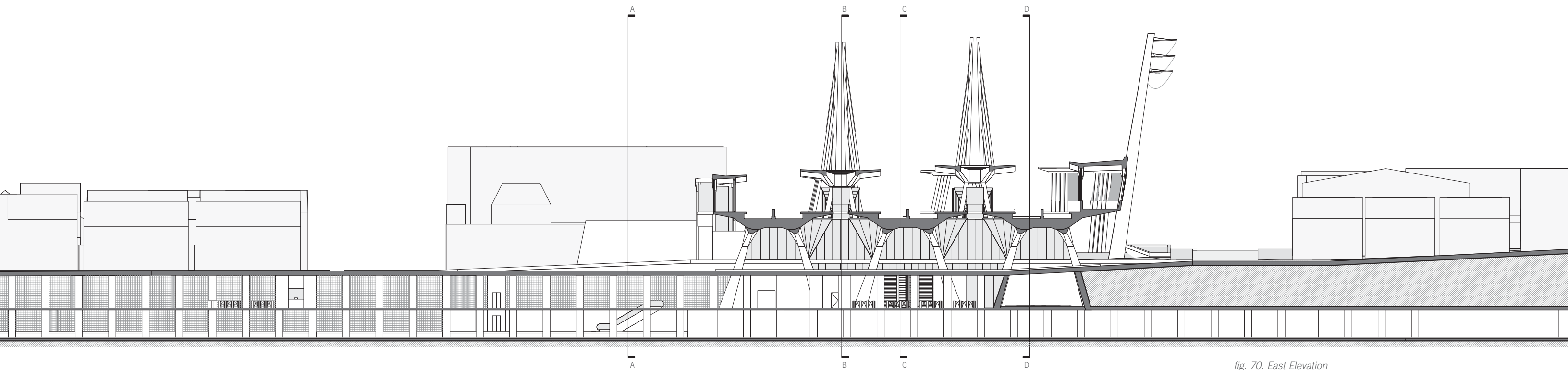


fig. 70. East Elevation
Scale: 1 : 500

In Transit 4

She had turned off her mobile phone and left her bicycle at the parking aisle. The station was dense and electric with activity. Past the racks she noticed a group of teenagers tinkering with their bicycles at workbenches, adjacent to a bicycle retail shop. The paying customers, the rushed commuters adjusting their chains, the shop staff, and the station security mingled freely, sharing tools and advice.

The clean, oiled city-cycles for sale caught her eye for a moment, reminding her of the first day she had worn her prosthetic. But she was quickly distracted by the ringing clanks and heavy music escaping from the fitness centre down the hall. Through a translucent overlook, she could just make out the jerking movement of exercise machines and the swift fitness routines of office workers on break. Their bodies flexed in rhythm with the rumble of the trains above, driving piston-like muscles in solid motion for fifteen minutes at a time, before refuelling at the juice bar above.

As she moved through the station, she felt slightly nervous navigating the meandering travelers waiting for their trains. In the months after she had first worn her prosthetic leg, the syncopation of her gait drew unwanted attention. Now the motion was fluid but she was still afraid of being jostled and losing that stride. She kept a close watch on the movement of the crowds, deftly weaving a path, pivoting to slip through openings, now on her own leg, now on the prosthetic. She balanced her motion in a quiet dance, a ballet all the more extraordinary as it was performed unseen.

The ticket counter was busy and she had a bit of time before her train so she took the chance to explore the station further. As she walked through the vestibule at the south of the western concourse, she noticed a winding staircase and an elevator, both indicating passage to the eastern half of the station. The elevator opened on to a walkway traversing Spadina Road, giving a vista south along the avenue toward the downtown.

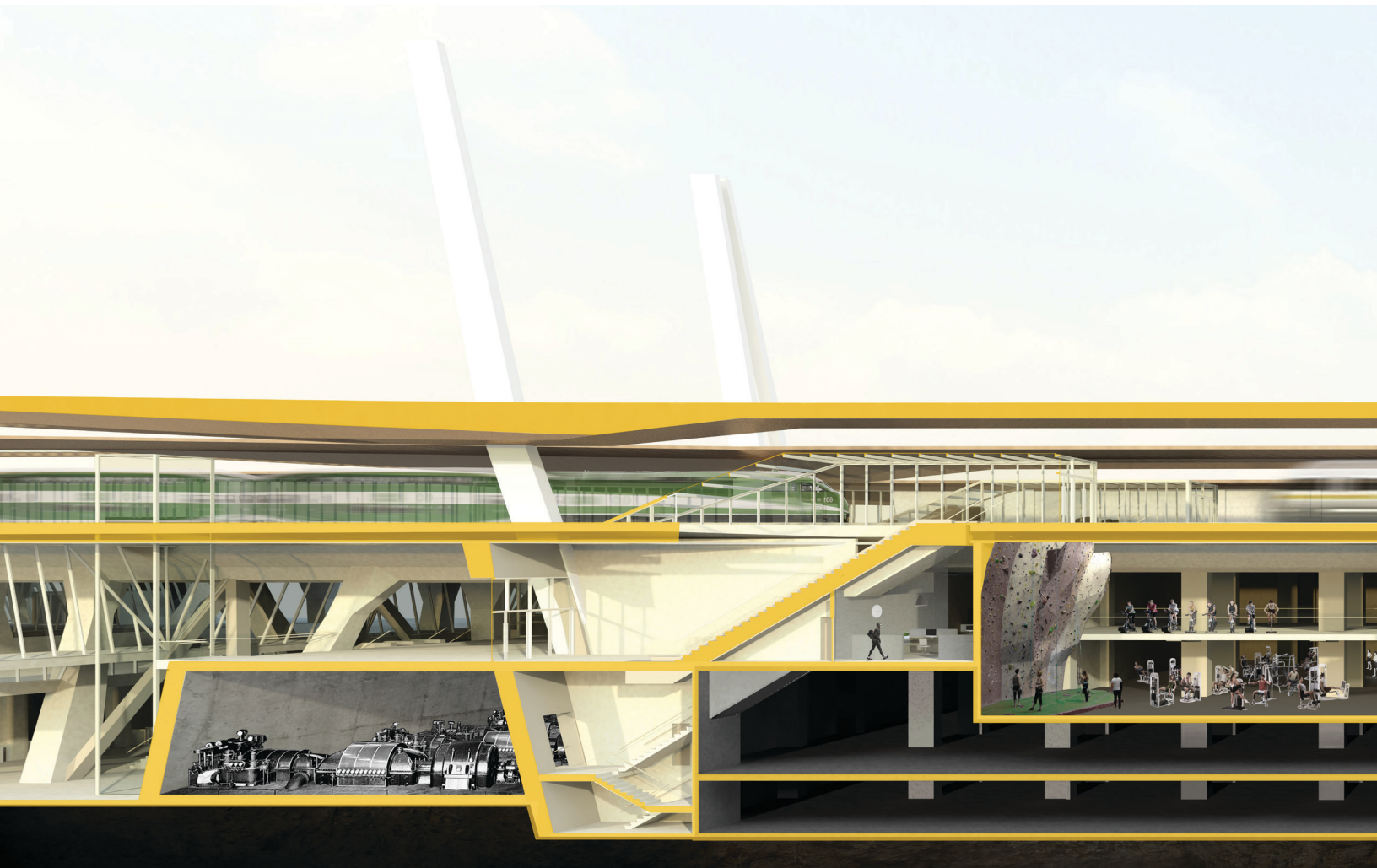




fig. 71. The Station Amenities

Below the tracks, amenities for travellers and the surrounding neighbourhood are packed alongside the transit concourses and ticket offices. A fitness centre offers commuters the chance to incorporate a workout routine into their trip to or

from the office; a bicycle shop along the corridor to the car parking can entice drivers to an alternate form of transport; a public bicycle workshop allows cyclists to make repairs to their rides.

The walkway exited out onto a balcony overlooking the main station hall. She watched the bustle of travellers on the floor below for a moment before catching sight of a soft glow seeping out of a space at the opposite end of the hall. She slowly climbed the stairs and ramps across the north balcony, weaving between people as they lounged, waiting for their trains.

The enticing light was radiating out of a restaurant. Across the tables and chairs, she could see clear through to a window looking out onto the tracks beyond. The sun glinted off the windshield of a train engine as it pulled around the corner towards the station. The view was mesmerising. She made a plan to eat there after she returned—or maybe just have a drink—to watch the throbbing motion of the city. But for now she had a train to catch.

fig. 72. Restaurant

At the far end of the station, diners can enjoy a meal before their departure, watching the trains as they speed around the bend on their journeys across the city



fig. 73. The Great Hall

Crowds gather and disperse with the flow of the trains, slipping in and out of the city with ease

After buying her ticket she wandered back to the centre of the great hall. Standing at the heart of the station, eyes scanning the room, the travel ads, the ticket counters, the departure and arrivals board, the incessant motion, the soaring ceiling, the faces, the entrances, the exits – her head spun. From this point in space, countless others could be reached—a myriad of destinations, improbable opportunities, a splayed array of experience—a portal giving access to the city’s potential. Beyond the station walls spread a network of tracks, timetables, conductors, accountants, bridges, switches, plumbing smoke, coursing electricity . . . a tangle of elements already churning in motion that would allow her to board a train and set off on a journey. Her eyes were on the clock fixed high on the wall, watching the seconds count as she plotted the course in her head.



fig. 74. Intersecting Paths

Regional rail, streetcars, buses, and the subway overlap in a tight knot of motion

It was 1.31 in the afternoon. Streetcars hummed on the level below, the floor trembling slightly as one accelerated and departed. Even deeper lay the subway. She could sense the rhythm of the underground lines like the subtle pulse of blood in her navel. A few buses waited at the opposite end of the station, idling in the northern shade, their drivers conversing by the road. She stood watching the ebbs and tides of the crowds until the PA broke her daydream—five minutes had elapsed and her train was arriving on the third track.

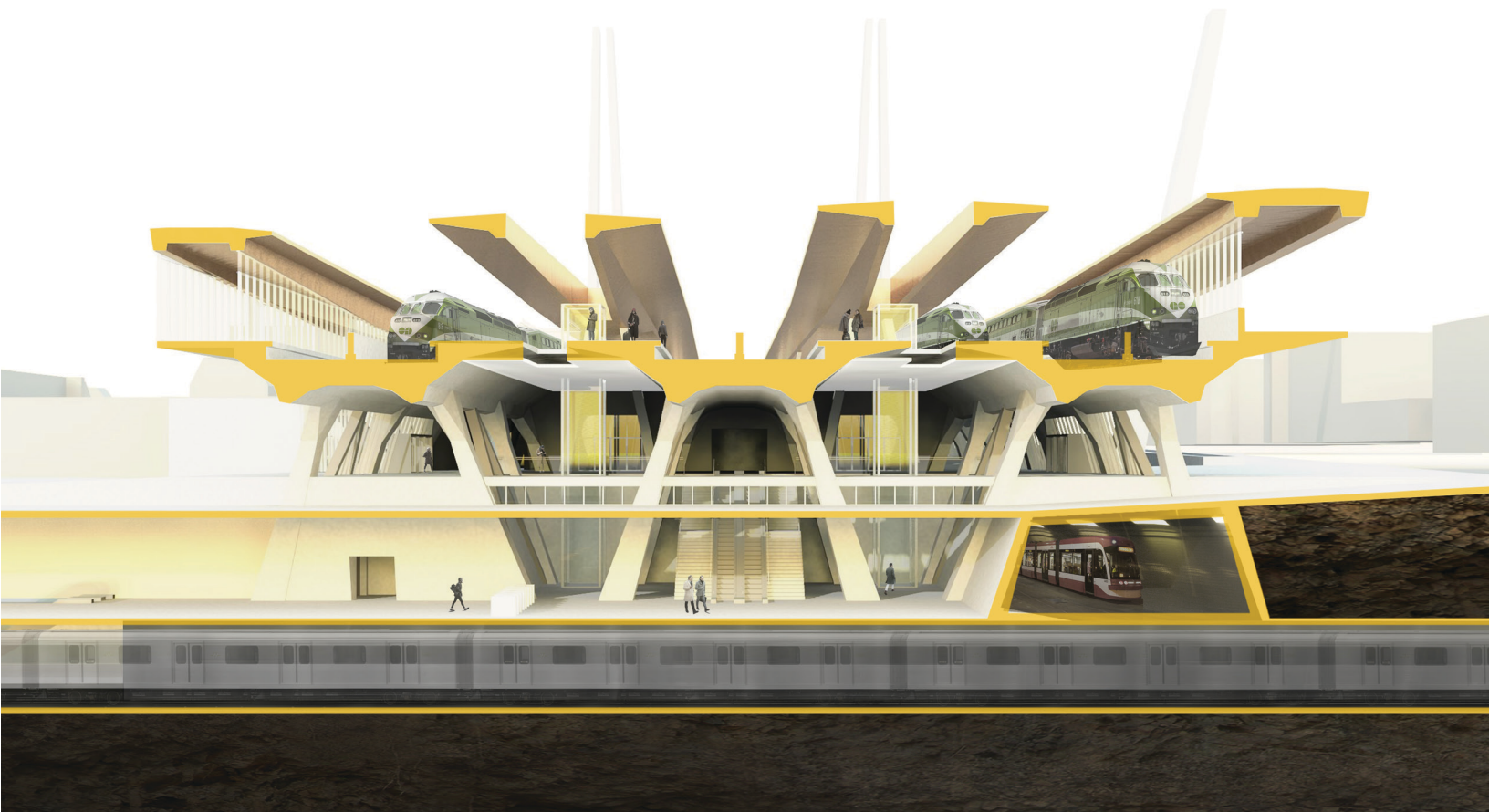


fig. 75. Conductivity

The angular lines of the station roofs follow the flow of motion, catching and propelling the machines and people who move below them

The elevator cab ascended to track level, swiftly filling with a brilliant light. The doors slid open and she stepped carefully over the gap onto the concrete. The train lay quietly at the edge of the platform, languidly stretching from one end of the station to the other. She sensed the exhilarating energy of the engine vibrating through her alloy leg, the two resonating with a faint hum. She stepped inside one of the coaches just as a clear tone and a hydraulic hiss signaled the closing of the doors. As her train accelerated out of the station, another pulled in across the platform and a third raced by on the express track.





fig. 76. Summerhill Station

The disused station no longer holds traction for the city's motion. Trains slip by frictionlessly.

In less than a minute the train was crossing Yonge Street. The Summerhill clocktower, marking the former railway station, long since closed, flit quickly by the window. The station no longer held any traction; the stately ticket hall and ornate track tunnels rested somewhere deep in the recesses of Toronto's memory. But they had no capacity to contain the velocity and volume of energy that now coursed along the rails. The station might strain and crack under the weight of a train stopping here. The woman glanced down, away from the window, smoothing her pants over her thighs, before leaning back and letting her mind begin to piece together a new station around the old clocktower—a parasitic construction taking hold of the stone and concrete, stretching the tunnels and platforms, creating fissures in the floor, opening on to the throbbing subway below. The clocktower itself began to grow upwards, climbing past the pinnacles of condominiums and bank towers.

She was jostled from her daydream by the approach to the Don Valley. The ancient river had been crossed before, and each time with Herculean effort. This crossing was no different; when





fig. 77. Bridge over the West Don

The railway leaps the Don Valley, stretching the city to the northeast

under construction, the city had looked on in apprehension and wonder as the new bridge's pylons reached up towards each other. Now the seemingly impossible triangle flexed and closed firmly with its apex set directly above Eglinton Avenue, braced for the tremendous force of the train's thrust. The tense wires extending from the trackway drew the woman's gaze upward. She had glimpsed the sharp point far in the distance but from the train, despite pressing her cheek tight against the window, the angle was too steep. Within a few seconds the massive structure seemed nothing more than an apparition but the sharp geometry was burned into her memory.

Crossing highway 401, the train slowed. Behind the houses, townhomes, condominiums, and warehouses, just to the east of Kennedy Road, it came to a soft stop. Commuter trains speeding away from Union Station, express trains to and from the airports, and the West Highland Creek all converged here. Travellers slipped between the railways discreetly, noting the time as they hurried below the tracks alongside the creek. Soft echoes of far off forests murmured in the rippling water.,





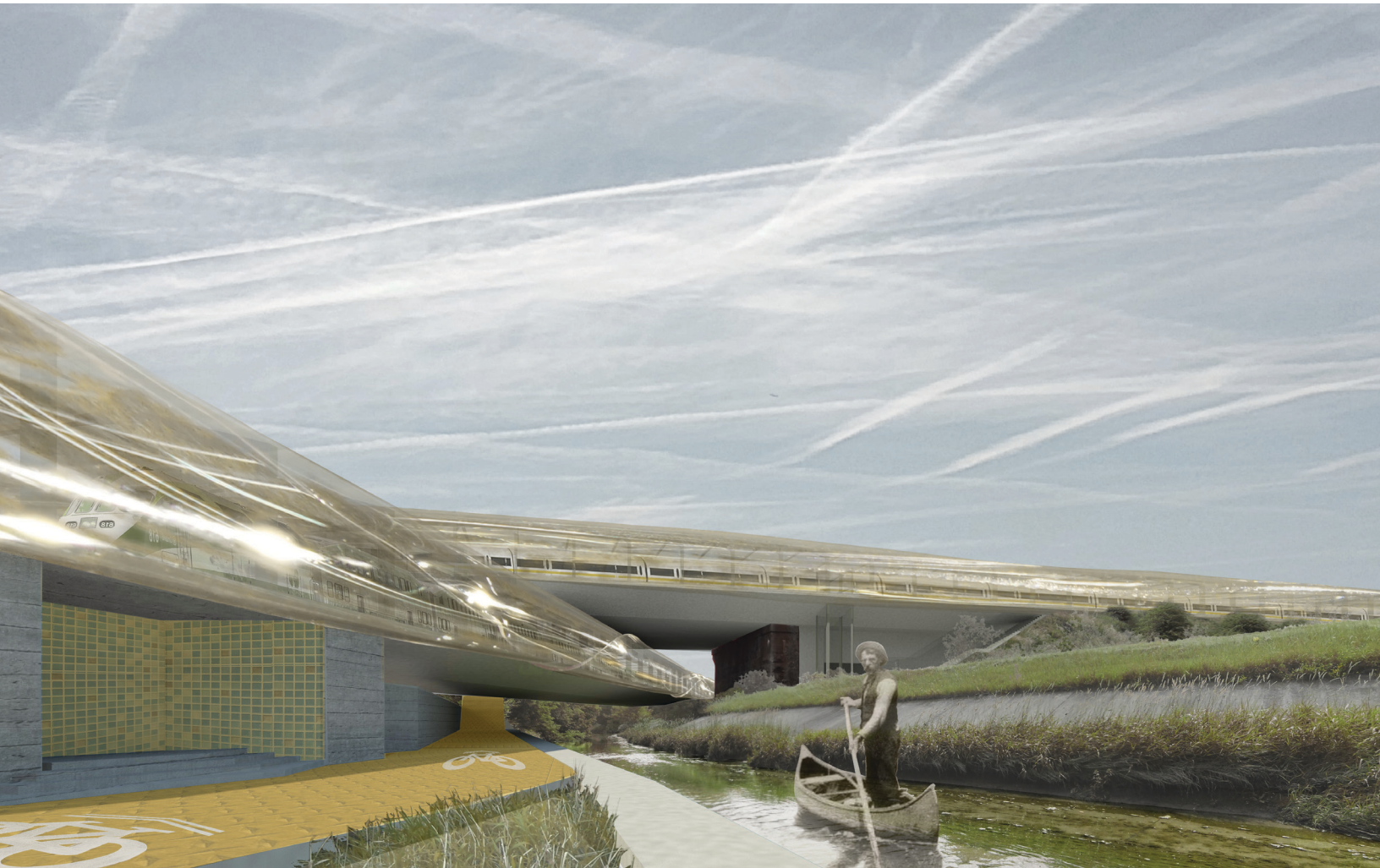
fig. 78. New Agincourt Station

The trajectories of trains and the West Highland Creek converge tenuously.

carrying memories of trappers and traders. From her carriage, the woman watched the creek flowing south towards the lake as the train on the lower tracks pulled away from the station and moved towards the north. The clear tone rang out again and the doors hissed closed.

The city's neighbourhoods continued to thin as the train moved to the northeast. The stations here stood solitary in vast fields, patiently beckoning the city to draw closer. Years passed slowly as, building by building, new pockets of the city spread around each node. Distant places tentatively reached out and attached themselves to Toronto—Claremont, Glen Major, Port Perry, Scugog. The woman searched the maps of her mind and even stranger names appeared along the thin line as it moved further and further from the city—Kawartha, Omemee, Bobcaygeon. Could she reach Algonquin some day?

Just before passing under highway 407, the train glided past the last strip mall, the last tract of development, the last house, and the last fence. She could feel the train accelerating as it neared the airport. In an instant, it had leapt over the cul-





vert of a small stream and plunged, with an intense pressure, into the ground.

In the darkness, the woman closed her eyes. She could still see the sharp point of the Eglinton bridge; she imagined the sound of the shimmering water of West Highland Creek; the Summerhill clocktower stretched towards the sky; the texture of Toronto's bricks scratched her fingertips. She had reached the edge of the city but it permeated her thoughts and stretched out beyond the province, seeping across the borders of the country. The energy with which it had propelled the train spread deep into the tunnel. And as light began filtering into her cabin again, she remembered the sensation of being carried into the air.

fig. 79. The pomoerium

Crossing the limits of the city, the train plunges into the earth

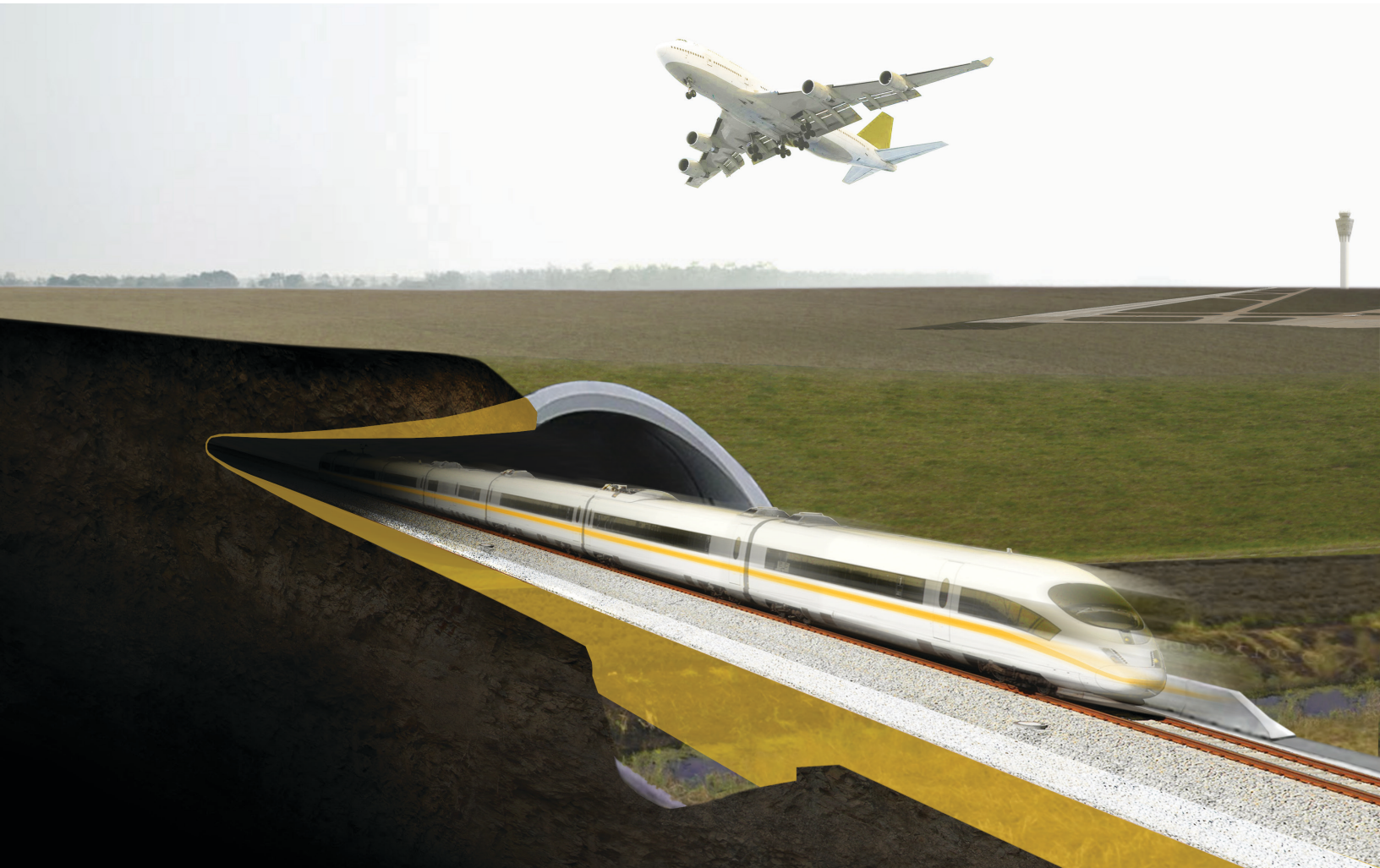




fig. 80. The proposed line overlaid on Ontario's future projected routes of travel.

Eccentricities

Their story begins on ground level, with footsteps. They are myriad, but do not compose a series. They cannot be counted because each unit has a qualitative character: a style of tactile apprehension and kinesthetic appropriation. Their swarming mass is an innumerable collection of singularities. Their intertwined paths give their shape to spaces. They weave places together.

– Michel de Certeau, *The Practice of Everyday Life*

In solidifying the corridors of a city's movement, transport infrastructure plays an overwhelming role in dictating the lifestyles, aspirations, and patterns of a population. The cumulative effect of the regulated and resonating experience of any type of transit is an ingrained and inextricable identity with that mode's particular shaping of motion and memory for its users. Personal expression is increasingly subsumed in the thick tangle of access control, volume restrictions, time regulation, safety measures, etc. Roaming freely is an infrequent experience—more often than not, travellers are herded.

The problem of constantly increasing speed is especially critical. Paul Virilio, in his book *Speed and Politics*, argues that the increase in speed and, associatively, of force and the potential for disaster necessitates a parallel, ever tightening grip of regulation and control and precipitates a proportional and equally steady decrease of pliability in direction, choice, and expression, ultimately leading to the limitation of freedom. Virilio references “the racecar driver who is no more than a worried lookout for the catastrophic abilities of his movement.”⁵¹ The strength of the limits necessary to adequately control or even influence movement at great speed become ever more restrictive. Flexibility and expressiveness are negated. The experience of movement, and by association, the memory embedded in its trace, becomes normalised.

51 Virilio, 158

Guided along paths controlled more by programmed reaction to contingency, speed overrides the articulation of the will of individuals, and even of groups, subjecting it to movement's own logic of efficiency and control. Marc Augé, in his book *Non-Places*, similarly suggests that the experiences produced by the conditions of unfamiliar forms of (super-) modern existence, such as high-speed movement, cannot be defined with respect to relations, history, or concerns of individual identity. In contrast to established places whose qualities have been understood and incorporated by their users, the novelty of non-places renders understanding and manipulation impossible; relinquishing control and assuming a role in the collective identity is the only apparent solution. Augé explains further:

‘Anthropological place’ is formed by individual identities, through complicities of language, local references, the unformulated rules of living know-how; non-place [on the other hand] creates the shared identity of passengers, customers or Sunday drivers. No doubt the relative anonymity that goes with this temporary identity can be felt as liberation by people who, for a time, have only to keep in line, go where they are told, check their appearance.⁵²

52 Augé, 77-8, 101

Carried by a process with which they have no familiarity, the users of a non-place are at the mercy of its whims. At the same time, the perception that an enigmatic but over-arching structure is guiding their motion relieves them of responsibility for their own actions and frees them from obligations to processes beyond those of the system they are forced to temporarily submit to. The situation recalls Jean Baudrillard's exultation in the reshaping of freedom on the American freeway; the freeway driver, as a singular entity involved in the operation of a complex system, can derive a sort of joy from the sense of purpose and direction offered in the ability, surreptitiously forced on him or her, to contribute to the smooth continuity of the experience.⁵³ The convenience and opportunities of non-places are offered in exchange for their users' complicity with their incomprehensible systems.

53 Baudrillard, 53-4

Despite the apparent constrictions created in the non-places of

high speed, the nature of their repetitiveness and ubiquity and the tendency for any regularly used system or experience to become familiar over time still offers the potential, though slight and with much greater effort, for acclimatisation and the eventual establishment of a sense of place in motion. Habituation to a ritual such as that created by air travel and all of its associated check points and waiting periods is perceived as elusive because of the infrequency of use for the general public. But the business traveller who is required to make weekly flights will soon develop routines and preparations to ensure that the passage goes smoothly, limiting luggage, dressing so as to avoid attention, minimising exertion so that he or she appears calm, etc. The traveller becomes able to optimise waiting periods by arriving slightly early but boarding last or by delaying check-in until the point when the transition between security points is made continuous, creating opportunities for sustained periods of concentration where reading or correspondence might be accomplished. In time, and through casual discourse about the experience (the absence of which is probably the primary hindrance to the creation of a collective identity in Augé's 'non-places'), a feeling of familiarity and ease will develop, in some ways akin to the natural manner with which a Roman will find the ideal seat at a café, chosen to coincide with the course of the sun over the piazza and its intersection with the errands of friends.

The framework that builds over time as velocity increases and traces accumulate, renders the city and its networks seemingly ever more restrictive. The spaces between buildings are fixed, speeds are limited, flows are channelled, destinations are set. Outside of the context of use, these structures can be compared to the lifeless lines drawn on a map to mark pedestrians' routes which Michel de Certeau discusses in his book, *The Practice of Everyday Life*. The vectors, 'here well trodden, there very faint ... going this way and not that', do indeed provide a mapping of an abstracted itinerary but brought outside of the context of time they tell hardly a fraction of the actual experience of motion: 'The trace left behind is substituted for the practice.' De Certeau goes on to explain the 'enunciative' function of the *practice* of movement—every pedestri-

54 de Certeau, 97

an participates in the codified system of the city but appropriates it personally.⁵⁴ One pedestrian will stride with purpose straight across an intersection while another will curve slightly in tangent with the opposite sidewalk and subtly hop the curb—each path through the city will have its own tone and rhythm, emphasising discreet and particular elements.

55 *ibid.*, 99

While transport infrastructure traces the common spaces of movement for a population, in their everyday use, the motion of each citizen ‘affirms, suspects, tries out, transgresses, respects, etc. the trajectories it “speaks”.’⁵⁵ As steady and definite as the slow, transformative force of time, ‘the ordinary practitioners of the city’ continue to mark their territories:

56 *ibid.*, 93

They are walkers, *Wandersmänner*, whose bodies follow the thicks and thins of an urban “text” they write without being able to read it. These practitioners make use of spaces that cannot be seen; their knowledge of them is as blind as that of lovers in each other’s arms. . . . The networks of these moving, intersecting writings compose a manifold story that has neither author nor spectator, shaped out of fragments of trajectories and alterations of spaces: in relation to representations, it remains daily and indefinitely other. . . . A migrational, or metaphorical city thus slips into the clear text of the planned and readable city.⁵⁶

Winding their way down back alleys, J-walking across gridlocked streets, squeezing past fellow passengers crowding the streetcar, slipping under yellow traffic lights, picking their way through hoards of shoppers in a mall, the ordinary practitioners leave fleeting traces of their own, subtly reshaping the city as they move; a slow trickle of eccentric gestures contesting the solidity of the city.

Appendix A

Toronto Dithers

The following collection of articles culled from nearly two years of newspaper clippings depict Ontario's, and more specifically, Toronto's perpetual difficulty in constructing, or even imagining, new transport infrastructure, even as congestion slowly but surely constricts the region.

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23 November 2011. Kalinowski, Tess. Metrolinx confirms downtown relief line is still on the map. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1091627-metrolinx-confirms-downtown-relief-line-is-still-on-the-map>>

Metrolinx CEO Bruce McCuaig confirms the relief line remains in the scope of the agency 'Big Move' plan. Issues of the future capacity of Union Station are raised with a discussion of how the problems might possibly be alleviated.

30 November 2011. Kalinowski, Tess. TTC may not run the Eglinton Crosstown LRT. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1094531--ttc-may-not-run-the-eglinton-crosstown-lrt?bn=1>>

The operation of a new LRT line for Eglinton Avenue will not necessarily be provided by the TTC. Metrolinx investigates the potential for a private company to design, finance, build, operate, and maintain the line. The merits of alternative financing and procurement policies are discussed, debating the potential costs, losses, and gains for the government/taxpayers.

19 December 2011. Ferguson, Rob. Construction to start in spring on airport rail link. *The Toronto Star*. <<http://www.thestar.com/news/canada/politics/article/1104270--construction-to-start-in-spring-on-airport-rail-link?bn=1>>

A passenger rail link, providing service from Union Station to Pearson International Airport is scheduled to begin construction in the spring of 2012. Projected costs, benefits, and resulting transit experience are discussed. Continued debate surrounding the electrification of the line.

30 January 2012. Doolittle, Robyn. Transit City flap raises prickly question: What power does Toronto's mayor have? *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1123814--transit-city-flap-raises-prickly-question-what-power-does-toronto-s-mayor-have>>

Mayor Rob Ford declares intention to 'kill' any revived Transit City plan to run light rail transit above ground on major city avenues and proposes subways instead. His authority to do so is questioned. Concerns regarding funding for subway alternative are raised. The crux of the controversy rests primarily on the approval rating of the Mayor himself.

31 January 2012. Kalinowski, Tess. Toronto councillors throw TTC chair Karen Stintz under the bus. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1124517--toronto-councillors-throw-ttc-chair-karen-stintz-under-the-bus>>

Councillors aligned with Mayor Rob Ford seize control of TTC board in order to block attempts to reinstate a plan of light rail transit. Ford continues to propose subways while the chair of the TTC board, Councillor Karen Stintz, who espouses the alternative view implies Metrolinx requires clear direction from the city and proposes a compromise of LRT running both above and below ground. TTC chief general manager Gary Webster seeks clarification, confused by the differing view points.

01 February 2012. Kalinowski, Tess. Timeline: How Toronto's transit mess unfolded. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1125064--timeline-how-toronto-s-transit-mess-unfolded>>

A summary of the constant evolution of Toronto's transit plans, dating back to March 2007 when the TTC first unveiled a plan for light rail transit to be constructed along the waterfront, Sheppard Avenue, Finch Avenue, and north from the Scarborough RT, up to the dithering between Mayor Rob Ford, his allies, and the opposition on city council over whether to construct a subway, above ground transit lines, some buried transit lines, etc.

01 February 2012. Kalinowski, Tess and Michael Woods. Mayor Rob Ford goes on the offensive for his transit plan. *The Toronto Star*. <<http://www.thestar.com/news/article/1125071--mayor-rob-ford-goes-on-the-offensive-for-his-transit-plan?bn=1>>

Mayor Rob Ford reiterates his opinion that the city wants and needs subways. The leadership of TTC board chair Karen Stintz is both questioned and reinforced.

06 February 2012. Kalinowski, Tess. TTC chair moves to bury mayor's transit plan. *The Toronto Star*. <<http://www.thestar.com/news/article/1127253--ttc-chair-moves-to-bury-mayor-s-transit-plan?bn=1>>

Metrolinx looks to council to provide a firm decision on how to proceed with the projected LRT lines to be constructed at the north end of the city. Mayor Rob Ford provided a memorandum of understanding to the province outlining a request to run the lines underground while a majority of councillors support the originally agreed to plan of constructing the lines, for the most part, above ground. Councillor Giorgio Mammoliti expresses wish for a subway.

07 February 2012. Rider, David. Toronto councillor says province should ignore council if it rejects mayor's subway plan. *The Toronto Star*. <<http://www.thestar.com/article/1127526-ignore-council-transit-vote-and-just-start-digging-toronto-councillor-norm-kelly-says>>

Councillor Norm Kelly makes the plea that, if council votes against Mayor Rob Ford's subway vision, the province should still proceed based on the Mayor's preference. Kelly argues that Ford was elected by city residents on a platform of subway construction and that to pursue an alternative would be ignoring their will.

08 February 2012. Church, Elizabeth. TTC chair defeats Rob Ford, wins bid to bring transit above-ground. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/ttc-chair-defeats-rob-ford-wins-bid-to-bring-transit-above-ground/article2330860/>>

A vote to run the eastern leg of the Eglinton Crosstown LRT above ground passed Toronto council, 27 to 16, with two councillors absent. Mayor Rob Ford contends the meeting's decision still has no effect on the agreement between himself and the province to construct the line underground.

09 February 2012. Gee, Marcus. Ford pays price of obstinacy in council's rebuke of his transit vision. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/marcus-gee/ford-pays-price-of-obstinacy-in-councils-rebuke-of-his-transit-vision/article2331854/>>

The decision by Toronto city council to endorse a transit plan contrary to the wishes of Mayor Rob Ford calls the mayor's ability to lead the city into question.

09 February 2012. Baluja, Tamara and Patrick White. Province to Ford: 'Council rules supreme'. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/province-to-ford-council-rules-supreme/article2332548/>>

Premier Dalton McGuinty contradicts Mayor Rob Ford's assertion that the province will follow his transit plan rather than alternatives proposed by council. Relationships between the Mayor, the representative of the city to the province, the city council, and the administration of the provincial government are strained.

14 February 2012. Lorinc, John. Etobicoke councillors' letter seeks free vote on transit plan. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/etobicoke-councillors-letter-seeks-free-vote-on-transit-plan/article4171625/>>

A group of city councillors led by Doug Ford sent a request to Premier Dalton McGuinty for a vote in the legislature on the issue of subways versus light rail transit plans for Toronto after the city council had voted earlier in the week in favour of LRT.

15 February 2012. Dale, Daniel. Mayor Rob Ford silent on buried Sheppard subway report. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1131779--toronto-mayor-rob-ford-silent-on-buried-sheppard-subway-report>>

A report by the TTC presents a weak case for extending the Sheppard subway and is prevented from being released; Mayor Rob Ford refused to comment. Councillor Joe Mihevc implores for 'fact-based' discussion; Councillor David Shiner suggests the report is merely a prop to reinforce previous decisions made by the transit commission.

16 February 2012. Kalinowski, Tess. Metrolinx: Toronto needs to sign on dotted line for new light-rail plan. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1132755--metrolinx-toronto-needs-to-sign-on-dotted-line-for-new-light-rail-plan>>

Metrolinx indicates that it requires council to officially approve Sheppard Avenue transit plan. Toronto Board of Trade members weigh in on the need for Metrolinx to be allowed to fulfill mandate.

17 February 2012. Morrow, Adrian. The dreams and realities of public transit in the GTA. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/the-dreams-and-realities-of-public-transit-in-the-gta/article2342995/>>

A survey of citizen opinions and official plans regarding the transit situation in the Greater Toronto Area. Metrolinx funding is brought into question; plans to increase services on the GO network; transitway in Mississauga under construction; Hamilton plans an LRT while its mayor pushes for improved GO service; York hopes to rely on bus rapid transit and subway extension; Durham scales back plans for BRT service; Halton plans two BRT lines.

20 February 2012. Jackson, Emily. With TTC head likely to be sacked, opponents of Mayor Rob Ford plot next moves. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1134266--with-ttc-head-gary-webster-likely-to-be-sacked-karen-stintz-asks-why-now>>

TTC head Gary Webster is projected to be removed from his position as head of the transit commission, the move largely perceived as a consequence of his support of light rail as opposed to Mayor Rob Ford's preference for subways. Meanwhile, councillors debate the composition of the commission's board and comment on council's decision to proceed with their LRT plan.

20 February 2012. Church, Elizabeth and Carys Mills. Toronto transit chair to commissioners: What's next? *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/toronto-transit-chair-to-commissioners-whats-next/article2344291/>>

A meeting is set by the Toronto's transit commissioners to decide the fate of TTC head Gary Webster. TTC board chair Karen Stintz questions the intentions of the meeting and worries about what the commissioners future plans might be.

22 February 2012. Doolittle, Robyn. TTC light rail plans are full speed ahead, regardless of politics. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1135380-ttc-light-rail-plans-are-full-speed-ahead-regardless-of-politics?bn=1>>

Gary Webster is fired as head of the TTC but the light rail initiative is projected to proceed. Concerns of ensuring the necessary bureaucratic processes are followed in a timely manner are voiced.

27 February 2012. Grant, Kelly. McGuinty, Ford disconnected on rail lines. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/mcguinty-ford-disconnected-on-rail-lines/article2351971/>>

Premier Dalton McGuinty has made clear that his administration will follow the lead of Toronto's city council while Mayor Rob Ford continues to imply that his own plans will override, in the eyes of the province, any decisions made by council. Ford suggests McGuinty risks losing seats by not listening to the mayor because the mayor 'listens to the voters'.

28 February 2012. Kalinowski, Tess and David Rider. Mayor Rob Ford's subway dream for Sheppard could be dead March 15. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1138269--mayor-rob-ford-s-subway-dream-for-sheppard-could-be-dead-march-15>>

Council moves scheduled meeting to decide fate of Sheppard transit proposals from March 21 to March 15.

29 February 2012. Church, Elizabeth and Kelly Grant. Ford bids for Sheppard compromise. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/ford-bids-for-sheppard-compromise/article2353536/>>

Council readies to vote on Sheppard Avenue transit plans on March 15. Mayor Rob Ford attempts to garner support for extension of the subway while council leans towards light rail transit.

01 March 2012. Rider, David. Mayor Rob Ford promises no new taxes to help fund Sheppard subway. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1139607--mayor-rob-ford-promises-no-new-taxes-to-help-fund-sheppard-subway?bn=1>>

Mayor Rob Ford discusses sources of revenue to fund transit included taxes before declaring a moratorium on new taxes by his administration. Funding for Ford's proposed subway extension remains unclarified.

04 March 2012. Mudhar, Raju. LRT or subway? Scarborough residents weight their options at town hall. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1140812--lrt-or-subway-scarborough-residents-weight-their-options-at-town-hall>>

Some Scarborough residents felt the expert panel promoting light rail transit was biased while others felt the LRT to be a reasonable transit option for the area.

04 March 2012. Moloney, Paul. Council showdown looms over who should be on the Toronto Transit Commission. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1140761--council-showdown-looms-over-who-should-be-on-the-toronto-transit-commission>>

A survey of the shifting opinions and projected composition of the TTC board.

05 March 2012. Kalinowski, Tess. TTC: Councillors retain control of transit board. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1141102--ttc-s-karen-stintz-moves-to-dissolve-transit-board>>

The TTC board remains composed of councillors favourable towards the commissions LRT plan. Structural changes to occur in the future still leave councillors as majority members of the board (seven councillors to four private citizens).

07 March 2012. Kalinowski, Tess. Eglinton LRT first up at new TTC board. *The Toronto Star*. <<http://www.thestar.com/news/cityhallpolitics/article/1141766--eglinton-lrt-first-up-at-new-ttc-board>>

Reformed Toronto Transit Commission board to release report on the pros/cons of light rail transit on Eglinton and prepares to engage with Infrastructure Ontario.

09 March 2012. Merringer, Ian. What's the city doing about traffic jams? Not much. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/globe-to/whats-the-city-doing-about-traffic-jams-not-much/article2365274/>>

The Toronto Board of Trade released a study in 2011 showing congestion costs the GTA over \$6 billion per year in lost productivity, and gave Toronto the lowest ranking for commute times among 19 major global cities. No study on congestion currently exists; a limited study commissioned by the city is set to take place within the year for the area bounded by Bathurst and Jarvis, Queen and Lakeshore.

15 March 2012. Rider, David. Toronto transit: Sheppard panel will overwhelmingly endorse LRT over subway options. *The Toronto Star*. <<http://www.thestar.com/news/article/1146793--toronto-transit-sheppard-panel-will-overwhelmingly-endorse-lrt-over-subway-options>>

An expert panel weighing the criteria of ridership, network connectivity, level of service, economic development, accessibility, etc. ranks light rail transit on Sheppard Avenue above the alternatives of a full subway line or extending the existing line two additional stops to Victoria Park Avenue. Mayor Rob Ford continues to insist on the populist desire for subways.

16 March 2012. Rider, David. Toronto Transit: Mayor Rob Ford talks referendum after panel backs Sheppard LRT. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1147414--expert-transit-panel-recommends-lrt-on-sheppard-plan-to-build-public-support>>

Mayor Rob Ford insists ‘the taxpayers’ want subways and vows to take the matter to a referendum despite an expert panels recommendation of light rail transit on Sheppard Avenue instead.

19 March 2012. Church, Elizabeth. Council gets light-rail disasters instead of a subway plan. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/national/toronto/council-gets-light-rail-disasters-instead-of-a-subway-plan/article2374605/>>

Supporters of Sheppard subway extension argue against light rail. Councillor Norm Kelly hands out images of light rail transit crashes. Councillors seek a suggestions on how to fund the subway.

23 March 2012. Kalinowski, Tess. Mayor Rob Ford co-opts new TTC chief to his subway fight. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1150981--mayor-rob-ford-co-opts-new-ttc-chief-to-his-subway-fight>>

New CEO of the TTC, Andy Byford, expresses preference for subway over LRT but implores for further discussion on how to fulfill the city’s future transit capacity requirements. Mayor Rob Ford cites Byford as a subway proponent.

23 March 2012. Kalinowski, Tess. Rob Ford’s subway dream dead as Toronto council votes 24-19 for LRT. *The Toronto Star*. <http://www.thestar.com/news/city_hall/2012/03/22/rob_fords_subway_dream_dead_as_toronto_council_votes_2419_for_lrt.html>

Council votes in favour of essentially reinstating Transit City plan to run light rail transit on Toronto’s avenues. Mayor Rob Ford vows to make the decision an election issue with his campaign starting ‘right now’, TTC chair Karen Stintz suggests that it is time to move on, some Ford allies express respect for council decision despite disagreeing with it. The previous day, Ford tiraded against streetcars saying the people want, “subways, subways, subways.”

23 March 2012. Church, Elizabeth and Kelly Grant. Toronto's Mayor Ford vows to 'lead the charge' in halting light-rail transit. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/torontos-mayor-ford-vows-to-lead-the-charge-in-halting-light-rail-transit/article2379209/>>

A vote to reinstate a plan to run light rail transit on Sheppard and Eglinton Avenues, above ground, irritates Mayor Rob Ford who is opposed to surface level transit on city streets. He maintains hope that the province will ignore Toronto council's decision and only construct new transit underground.

23 March 2012. Kalinowski, Tess. Metrolinx ponders timing of Sheppard LRT. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1151234--metrolinx-ponders-timing-of-sheppard-lrt>>

Discussion of order in which Finch and Sheppard LRTs are constructed, considering assessment procedures underway and preventing Mayor Rob Ford from re-opening the issue. Ford continues to ponder holding a referendum.

08 April 2012. Kalinowski, Tess. Toronto transit: 'Downtown' relief line could be the subway suburbanites crave. *The Toronto Star*. <<http://www.thestar.com/news/transportation/article/1158278--toronto-transit-downtown-relief-line-could-be-the-subway-suburbanites-crave?bn=1>>

The downtown relief line, beginning with initial plans set out in 1910, is proposed as a solution to overcrowding on existing subway lines. Temporary relief has been provided by GO transit while measures are proposed by the TTC to make better use of existing infrastructure but concerns over projected capacity at Union and Bloor/Yonge Stations increase the perceived necessity of a relief line.

09 April 2012. Monsebraaten, Laurie. Toronto transit: Metro-
linx set to reveal plans for Finch and Sheppard. *The
Toronto Star*. <<http://www.thestar.com/news/transportation/article/1158787--toronto-transit-metrolinx-set-to-reveal-plans-for-finch-and-sheppard?bn=1>>

Set within a budget of \$8.4 billion provided by the province, Metro-
linx readies to announce how it plans to proceed with the construc-
tion of Toronto's future transit lines, taking into account council's
indicated preference for light rail transit.

26 June 2012. Kalinowski, Tess. Transit plan: Dramatic OneCity
proposal floated by Stintz, DeBaeremaeker. *The Toronto Star*.
<http://www.thestar.com/news/city_hall/2012/06/26/transit_plan_dramatic_onecity_proposal_floated_by_stintz_debaeremaeker.html>

A proposal by Councillors Karen Stintz and Glenn De Baeremaeker
amalgamates a wishlist of transit initiatives costing \$30 billion,
built over 30 years, and financed through a property tax increase
and assistance from provincial and federal governments.

11 July 2012. Kalinowski, Tess. OneCity: Toronto council buries
TTC chair Karen Stintz's transit plan. *The Toronto Star*. <<http://www.thestar.com/news/gta/transportation/article/1224912--onecity-ttc-chair-karen-stintz-accused-of-dashing-commuter-hopes>>

Transit plan proposing initiatives spread across the city put forward
by Councillors Karen Stintz and Glenn De Baeremaeker is quashed
by council in favour of a review of the transit plan previously or-
dered by council.

18 October 2012. Kalinowski, Tess. TTC makes the case for down-
town relief line. *The Toronto Star*. <http://www.thestar.com/news/gta/2012/10/18/ttc_makes_the_case_for_downtown_relief_line.html>

A TTC study projects excessive overcrowding on existing transit
services and proposes a new subway line to relieve some of the pres-
sure, extending from Pape to the Roncesvalles area via King Street.

24 October 2012. Kalinowski, Tess. TTC reopens Scarborough debate in surprise move. *The Toronto Star*. <<http://www.thestar.com/news/gta/transportation/article/1276726--ttc-reopens-scarborough-subway-debate-in-surprise-move>>

The Toronto Transit Commission requested studies of extensions of the subway system into Scarborough, however the province indicated that it would not be reconsidering the current plan to convert the SRT to light rail transit.

15 November 2012. Kalinowski, Tess. TTC unveils Toronto's new streetcars. *The Toronto Star*. <<http://www.thestar.com/news/gta/transportation/article/1288334--ttc-unveils-toronto-s-new-streetcars>>

New light rail vehicle built by Bombardier in Thunder Bay is revealed at TTC's Bathurst St. Hillcrest facilities. The commission is paying \$1.2 billion for 204 vehicles which are 30 metres long and are projected to accommodate 251 riders per vehicle.

20 November 2012. Kalinowski, Tess. TTC's new citizen board members say customers come first. *The Toronto Star*. <<http://www.thestar.com/news/gta/transportation/article/1290696--ttc-s-new-citizen-board-members-say-customers-come-first>>

Biographies of new citizen members of the Toronto Transit Commission's board. They are asked what brings them to the board, if they ride the TTC, and to ponder what challenges face the commission. They voice concerns over coherence in development direction, customer satisfaction, and funding for transit projects.

02 March 2013. Kalinowski, Tess. Commuting and transit: 66% would pay more to their trip to work or school, new poll finds. *The Toronto Star*. <http://www.thestar.com/news/gta/2013/03/02/commuting_and_transit_66_would_pay_more_to_cut_their_trip_to_work_or_school_new_poll_finds.html>

A survey records the attitudes of Toronto area residents towards transit revenue tools and their familiarity with Metrolinx.

14 March 2013. Slaughter, Graham. TTC's new streetcar takes early morning maiden voyage down Bathurst St. *The Toronto Star*. <http://www.thestar.com/news/gta/2013/03/14/ttcs_new_streetcar_takes_early_morning_maiden_voyage_down_bathurst_st.html>

A feel-good story reporting on the first trip made in the city by a new Bombardier streetcar model.

23 April 2013. Doolittle, Robyn and Paul Moloney. Rob Ford's executive committee stays out of taxes for transit. *The Toronto Star*. <http://www.thestar.com/news/city_hall/2013/04/23/rob_ford_wants_city_to_look_at_porter_expansion_plan.html>

While Metrolinx solicits input from municipalities on preferred funding methods for transit construction, Toronto's mayoral executive committee, under the direction of Mayor Rob Ford, submits no position. The Toronto Region Board of Trade reacts, calling for council to debate the issue.

06 May 2013. Kalinowski, Tess. Scarborough councillors seek subway line instead of LRT. *The Toronto Star*. <http://www.thestar.com/news/gta/2013/05/06/scarborough_councillors_seek_subway_line_instead_of_lrt.html>

Despite council's previous agreement to convert Scarborough's existing rapid transit line with an LRT, Scarborough councillors propose to reopen the debate with the intention of replacing the SRT with a subway instead. The case for a subway vs LRT based on ridership, costs, construction, connections etc. are outlined.

07 May 2013. Kalinowski, Tess. Toronto Mayor Rob Ford's delay on transit tax debate ignored, council votes to hold discussion. *The Toronto Star*. <http://www.thestar.com/news/city_hall/2013/05/07/transit_tax_toronto_council_ignores_ford_votes_to_hold_debate.html>

While Mayor Rob Ford's executive committee refuses to engage in a debate regarding funding tools for regional transit projects, the city council votes to hold their own discussion.

10 May 2013. Moore, Oliver. Why Toronto has been waiting for the subway for 100 years. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/why-toronto-has-been-waiting-for-the-subway-for-100-years/article11874081/>>

Episodes in Toronto's history, explored in further detail in the web-book, *Rapid Transit in Toronto: A Century of Plans, Progress, Politics & Paralysis*, authored by Edward Levy, are outlined showing a long history of argument over transit plans.

13 May 2013. Kalinowski, Tess. TTC's Andy Byford calls on council for more money, more support. *The Toronto Star*. <http://www.thestar.com/news/gta/2013/05/13/ttcs_andy_byford_calls_on_council_for_more_money_more_support.html>

TTC head, Andy Byford, appeals to council directly to provide the political and financial support to provide transit outlined in the TTC's future service plans.

13 May 2013. Moore, Oliver. TTC chief Andy Byford makes plea for 'political support'. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/ttc-chief-andy-byford-makes-plea-for-political-support/article11885846/>>

Chief executive officer of the Toronto Transit Commission, Andy Byford, spoke at the Empire Club of Canada, pleading for political support as the projected level of funding for transit will not be sufficient to cover expected growth in the system.

17 May 2013. Kalinowski, Tess. Eglinton tunnel boring machine still idle. *The Toronto Star*. <http://www.thestar.com/news/gta/2013/05/17/eglinton_tunnel_boring_machine_still_idle.html>

While the machines sit idle, months after their projected launch date (the previous summer or fall), Metrolinx remains unconcerned as construction of the stations and interchanges are far more time-sensitive than the boring of the tunnels.

28 May 2013. Moore, Oliver. Ford denounces Metrolinx plan for transit expansion. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/ford-denounces-metrolinx-plan-for-transit-expansion/article12218318/>>

Mayor Rob Ford asserts that Metrolinx' proposed revenue tools are in opposition to the wishes of the city he represents and, at the same time dismisses plans for above-ground transit.

24 June 2013. Kalinowski, Tess. Subway relief line to be studied by Metrolinx. *The Toronto Star*. <http://www.thestar.com/news/gta/transportation/2013/06/24/subway_relief_line_to_be_studied_by_metrolinx.html>

Metrolinx puts out call for bids to create a study on a subway line to relieve congestion on existing services in Toronto, to be undertaken as part of the second wave of new transit projects in the Greater Toronto Area.

24 June 2013. Moore, Oliver. TTC to study making King car-free. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/ttc-to-study-making-king-car-free/article12790448/>>

The TTC plans a feasibility study on restricting traffic other than transit vehicles and bicycles along its King Street streetcar corridor during the morning rush hour. Headways for new streetcars are discussed.

28 June 2013. Dhillon, Sunny. Metrolinx threatens to suspend LRT work unless councillors reaffirm support. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/metrolinx-threatens-to-suspend-lrt-work-unless-councillors-reaffirm-support/article12890956/>>

Metrolinx seeks a clear directive from council after councillors resolved to support the extension of the Bloor-Danforth subway instead of the previously agreed to plan to replace the SRT with light rail transit.

01 July 2013. Kalinowski, Tess. TTC chief disputes subway price tag from Metrolinx. *The Toronto Star*. <http://www.thestar.com/news/gta/transportation/2013/07/01/ttc_chief_disputes_subway_price_tag_from_metrolix.html>

The TTC provided an estimate of \$500 million to recreate the existing Scarborough Rapid Transit line as a subway while Metrolinx puts the figure at \$923 million. Chief executive officer of the TTC, Andy Byford, notes original estimate by the TTC did not include ‘sunk costs’ for engineering and design of light rail connection with proposed Sheppard East LRT, or purchase of light rail vehicles. Metrolinx continues to request clarity as to whether the city wants the SRT converted to light rail as previously agreed or if it prefers the construction of a subway extension instead.

02 July 2013. Moloney, Paul. Metrolinx price tag for Scarborough subway leaves councillors fuming. *The Toronto Star*. <http://www.thestar.com/news/city_hall/2013/07/02/metrolix_price_tag_for_scarborough_subway_leaves_councillors_fuming.html>

Councillors Michael Thompson and Michelle Berardinetti question Metrolinx estimate of an additional \$923 million to convert existing SRT in Scarborough to subway instead of light rail, basing their disbelief on previous estimates provided by the TTC putting the figure near \$500 million. Councillors Perks and Matlow suggest indecision by council may cost the city.

03 July 2013. Ellison, Marc. Mayor Rob Ford makes a new pitch for Scarborough subway. *The Toronto Star*. <http://www.thestar.com/news/city_hall/2013/07/03/mayor_rob_ford_wants_to_extend_bloodanforth_subway.html>

Mayor Rob Ford has assigned Toronto city manager Joe Pennacetti to investigate options to fund the construction of a subway in Scarborough to replace the existing rapid transit line and present them to council by July 16.

11 July 2013. Church, Elizabeth and Adrian Morrow. Ontario, Toronto close in on deal to build Scarborough subway, scrap LRT. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/politics/ontario-toronto-close-in-on-deal-to-build-scarborough-subway-scrap-lrt/article13132509/>>

The Ontario provincial government and Toronto's city hall appear to be working towards an agreement on re-addressing transit plans in Scarborough. Staff from Premier Kathleen Wynne and Mayor Rob Ford's offices have been in discussion and officials in both respective governments have been in communication. Funding sources are yet to be worked out.

18 July 2013. Gee, Marcus. With subway decision, Ford finds the good in taxes. *The Globe and Mail*. <<http://www.theglobeandmail.com/news/toronto/scarborough-subway-vote-means-marginal-progress/article13295395/>>

Mayor Rob Ford joins Toronto city council in voting in favour of the extension of the Bloor-Danforth subway to Scarborough (instead of the previously proposed conversion of the SRT to light rail) along with an increase in property taxes to pay for the construction. The new proposal, however, is contingent on funding provided by both the provincial and federal governments.

17 July 2013. Kalinowski, Tess and David Rider. Scarborough subway: Toronto council backs plan but needs more cash. *The Toronto Star*. <http://www.thestar.com/news/city_hall/2013/07/17/stintz_srt_subway_a_boost_for_downtown_relief_line.html>

Toronto city council voted 28 to 16 to extend the Bloor-Danforth subway north of Kennedy Station. The plan, which would supersede previous efforts to convert the SRT to LRT, would allow the SRT to continue to function as the new extension is built, avoiding the need for replacement buses.

18 July 2013. Chown Oved, Marco. Scarborough subway: Route makes immigrants, students and poor the losers. *The Toronto Star*. <http://www.thestar.com/news/gta/transportation/2013/07/18/scarborough_subway_route_makes_immigrants_students_and_poor_the_losers.html>

The currently proposed route of the Bloor-Danforth subway extension recently passed by Toronto city council will run through low-density, higher-income residential neighbourhoods and only have four stops, including Kennedy Station. In contrast, the existing SRT travels through industrial areas and lower-income areas and, when converted to LRT, would have extended to Centennial College and have eight stops in total.

24 July 2013. Kalinowski, Tess. TTC ponders using electrified GO corridors for a subway relief line. *The Toronto Star*. <http://www.thestar.com/news/gta/transportation/2013/07/24/ttc_ponders_using_electrified_go_corridors_for_a_subway_relief_line.html>

GO transit's right-of-ways running through Toronto towards Georgetown in the west and Ajax in the East are considered as routes for TTC above-ground services. Construction in the corridors would eliminate the need for tunneling, reducing overall project costs.

29 July 2013. Wilding, Carol. Politicians should let Metrolinx to its job. *The Toronto Star*. <http://www.thestar.com/opinion/commentary/2013/07/29/politicians_should_let_metrolinx_do_its_job.html>

Carol Wilding of the Toronto Region Board of Trade writes an opinion article decrying Ontario and the Toronto region's inconsistent and political approach to transportation issues. She pleads for Metrolinx and the various levels of government to resist making transit decisions based on political power motivations.

Appendix B

The Aqueducts

This essay formed an early part of this thesis' research and provided a primary case study into the affective possibilities of infrastructure. It was not possible to smoothly incorporate the piece into the body of the work (beyond a footnote reference) but it remains a critical description of just how much influence a singular infrastructure (especially one which is more often than not, in the modern era, considered banal) can have on the shape, patterns, and identity of a city.

The main essay on the characters and connotations of the aqueducts is followed by a brief survey of the chronology of their construction.

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With such an array of indispensable structures carrying so many waters, compare, if you will, the idle Pyramids or the useless, though famous, works of the Greeks!

– Sextus Julius Frontinus

In 33 BCE, after eleven years of involvement in civil conflict arising from the death of Julius Caesar, Caesar Augustus' general, Marcus Agrippa, returned to Rome and was appointed *Aedile*, tasked with the stewardship of the city's buildings, structures, and festivals. Having a penchant for all things aquatic,⁵⁷ Agrippa took it upon himself to restore and improve the aqueducts. Beginning with the repair of the network, including the reconstruction of the largest existing aqueduct, the Aqua Marcia, and the restoration of the Cloaca Maxima, he went on to supervise the construction of a fifth aqueduct, naming it after Caesar the Aqua Iulia. More than a decade later, after leading the final defeat of Marc Antony, Agrippa had again returned to Rome and set out to complete a sixth aqueduct.

⁵⁷ Agrippa had command of the Roman navy during the civil war,

Soldiers searching for water in the region to the east of the city were said to have been led by a young girl to cool, fresh springs and it was from these that Agrippa sourced his new water supply. When construction finished in 19 BCE, the aqueduct carried the racing waters of the Aqua Virgo in a channel through the hills and across fields and farms for almost 20 kilometres, stretching across the campagna for yet another kilometre on an unrelenting repetition of arches, before springing over the walls of the city and snaking through pipes below the streets to feed fountains spread throughout the seven hills, finally spilling into a bathing complex behind the Pantheon.⁵⁸ Agrippa's water flooded into the city, gushing from five hundred new fountains and collecting in seven hundred new basins and pools, cascading over and around the hundreds of marble and bronze statues and stone columns he had erected to celebrate its arrival.⁵⁹ Though the water works of Agrippa were neither the first nor the largest in the ancient empire, the ambition and embellishment of their construction characterised the Roman attitude towards the infrastructure of the city's water supply. Over slightly more than five hundred years, the seemingly banal system designed to supply Rome's water needs grew to become its quintessential infrastructure.

58 Kleijn, 21-2

59 Morton, 45-6

While the first aqueducts were burrowed through the soil, kept below the surface either for the purposes of security or due to a lack of technology,⁶⁰ from the Aqua Marcia on, the conduits, after winding their way across the campagna through channels and tunnels and across bridges, rode the last kilometres to Rome on stone, brick, and concrete arcades. Wherever they could, the architects of the aqueducts avoided these elaborate and expensive constructions, cutting channels along long, circuitous routes, making use of the existing topography to maintain the level of the water at as high an elevation as possible.⁶¹ Six of the nine aqueducts which had their sources to the east and northeast of Rome arrived at the city from the southeast, some even doubling in length in diverting from a direct course, to make use of a narrow spur of elevated land and reduce the distance traveled on arches. However, when the aqueducts did emerge from the earth, they were hardly incon-

60 Winslow, 28-9, 96

61 Hodge, 170

spicuous.⁶² While earthworks and embankments might have been an appealing alternative to the exacting and laborious construction of the arcades, the Romans had a deft familiarity with the arch,⁶³ employing its materially efficient form in countless public buildings and structures. With no other requirement than to support a water conduit, the aqueducts acted as the perfect showcase for the precise engineering of the Roman arcade. As the ground gradually sloped away below and the piers of the arches grew to compensate, the channels seemed to soar towards the city, cutting a piercing path across the wilderness and farm fields carrying raging waters, restless to pour out again into the open air and be consumed.

As the furthest reaching extents of the city proper, the aqueducts assumed the privilege of announcing the grandeur of Rome to travelers and returning citizens. A. Trevor Hodge in *Roman Aqueducts & Water Supply* describes the sensation prompted by the appearance of these imposing public works in the campagna, lending them a persona as dominating as the empire itself:

As the traveller came into Rome along the Via Appia or the Via Latina and found himself gradually escorted, then almost encompassed about, by these mighty arcades, striding endlessly, mile after mile after mile, like a great army, across the fields on their way to Rome, how could he not feel that the city he was coming to was in truth the centre of the whole civilised world?⁶⁴

In their relentless regularity, strictly measured to achieve an ever-so-slight slope towards the city,⁶⁵ the aqueducts imposed themselves on the broad, shifting hills and valleys of the campagna and, as the network grew more ambitious and more extensive, made the growing intensity of the city evident even in the bucolic landscape. The aqueduct lines left traces further than 45 kilometres from the city walls. Dams constructed in the River Anio near Sublaqueum (now Subiaco) siphoned water into the Aqua Anio Novus which, threading its way through the landscape, carried the water over 85 kilometres to the city. To the east of Rome, the hills were pierced with tunnels and the valleys strewn with bridges and winding channels.

62 Winslow, 5. Historians of the aqueducts consistently highlight the aesthetic grandeur of these infrastructural works. Some were more effusive than others (ref. Pliny the Elder book XXXVI chapter 24 “. . . there is nothing to be found more worthy of our admiration throughout the whole universe.”) but all agree they were a monumental civic achievement.

63 Hodge, 164

64 *ibid.*, 170

65 In his *De Architectura* Vitruvius recommended a gradient in the channel of ‘not less than a quarter of an inch for every hundred feet’ (244) to prevent any stagnation of water. Excessive slopes were also to be avoided as they could create excessive force on the channel walls at changes in course. But in the execution of the works the ingenuity of Roman engineers can be read. See also Hodge, 191.

fig. 81. The specus
Water gushes from a conduit, restless to pour into open air



fig. 82. Fountain at the Villa d'Este
Aqueduct water channeled to the Villa d'Este cascades from a fountain in a display which hints at the torrents which must have poured from the fountains of ancient Rome.



But evidence of the aqueducts could be found in almost any direction around the city: the *Aquae Alsietina* and *Traiana* snaked north to lakes and springs in the northwest, while the *Aqua Virgo* trailed north before finding its source in the east. The most dense collection of aqueducts could be found on the narrow spur of land to the southeast of the city. Advantageous in its geology, over the centuries the elevated land grew thick with construction as the lines wove around and piled on top of one another on their route to Rome.

Drawing in towards the city, the cavalcade of man-made rivers infiltrated and reshaped the urban dynamic.⁶⁶ Monuments, fountains, and baths sprang up wherever the aqueducts spilled their water, gathering and feeding the life of the city at fresh, clean jets and shimmering pools. Intersecting and penetrating the city walls, the aqueducts flowed to the *castella*, the primary distribution points of the city's water. Despite their banal function, these structures were embellished with towering columns and grand statues, glorifying the arrival of the water. At Nîmes the remains of a *castellum* can still be found, decorated with frescoes of dolphins and fish and bearing traces of an observation deck and balustrade from which visitors could watch the water thundering into a broad stone basin before being channeled to the different sectors and uses in the city; the water was meant not simply to be consumed and disposed of but appreciated, even adored.⁶⁷

At Rome, though most of the *castella* disappeared, fell into disrepair, or lost their identities to the weak memory of the centuries, the massive ruin of the Julia Fountain (known also as the Trophies of Marius) at Piazza Vittorio Emanuele II remains a more than sufficient reminder of the reverence with which Romans treated their water.⁶⁸ Acting as the *castellum* for the *Aqua Iulia*,⁶⁹ the towering arrangement of niches, arches, and brickwork continues to dominate the surrounding piazza. An impressive collection of statues, reliefs, and inscriptions must have once covered the structure while the trophies from which the ruins received their alias, which now stand next to the statues of Castor and Pollux at the Campidoglio, filled its largest, now-crumbling archways, carrying its cascades on their broad shoulders.⁷⁰ The aqueducts, having traveled immense

66 Hodge explains how 'any serious [bathing] establishment needed [an aqueduct]. However, even though an aqueduct might be built principally for the sake of the baths, there were plenty of other uses for its abundant water supplies once it was installed. Thus the whole pattern of life in the city was liable to be changed – in Pompeii the coming of the aqueduct changed even the layout of the gardens and the flowers grown in them – and the wells and cisterns relegated to a lesser role, much as piped water must have reduced the impluvium in the Pompeian house to a function largely traditional and decorative (49).

67 Hodge, 6-8, 284-7

68 Winslow, 53

69 Murray, 87. The fountain has variously been identified as the terminus of the *Aquae Marcia*, *Iulia*, *Claudia*, and *Alexandrina*.

70 *ibid.*, 87, 248-9

fig. 83. Pool of the Acqua Paolo
Having spent its energy in furious movement through the aqueducts and emptying itself into the awaiting thirst of the city, the water laps gently at the edge of a pool



fig. 84. Drained
The streams of water slipping through the city wash away the debris and calm the dust and noise of the day



distances on structures requiring the labour of thousands of labourers, did not arrive humbly. Before slipping beneath the streets, they announced themselves with the thunderous noise of crashing water and extravagant displays of sculpture, declaring the power and wealth of the city which had created them.

Fed by the *castella*, the fountains scattered throughout the city collected Romans seeking refreshment or water to clean and cook their vegetables. Though more utilitarian in purpose, the fountains also offered an ever changing and enchanting spectacle of movement and sound. Spouting from masks, sculpted figures, and ornamental fixtures, the points where the water spilled from the elaborate network of pipes and conduits spread beneath the city became meeting places where the day's news could be shared as containers were filled and thirst was quenched. Under the murmuring of the fountains, gossip and rumours could spread discreetly as the exclamations of market vendors and the screams of children reverberated on the surfaces of the pools while, all around, conversations mingled as fluidly as the water. Without a means or a desire to regulate the flow of the aqueducts,⁷¹ the fountains ran incessantly, the babbling of their cool streams calming the noise, dust, and heat of the day and reassuring the restless population of the vitality of the city even in the dead of the night. As the Romans slept, the waters of the aqueducts swept through the streets and sewers, carrying away the day's debris and, in the morning, flushed the sleep from half-open eyes.

Similar to the fountains, the baths operated as focal points of social collection and public hygiene but on a much grander scale. Built for public benefit but fashioned as displays of the magnanimity of generals and emperors, funded by the spoils of their triumphant campaigns, they were extravagant both in their construction and in their consumption of aqueduct water. Lavish complexes providing space for recreation and discourse, they occupied central positions both in the physical cities of the empire and in the lives of its citizens. In their massive atria, broad courtyards, and soaring halls, while exercising, relaxing their muscles, scraping their bodies clean, or taking the waters, the bathers immersed themselves in

71 Morton, 10-1

72 Carcopino, 254. The fee to use the facilities was a quadrans, the smallest coin minted during the reign of the empire.

the civilizing effects of the aqueducts. Drawn out conversations in the heat of the steam rooms or lively chatter in and around the cold baths and swimming pools brought together any citizen willing to pay the small price of admission.⁷² As the empire expanded, the baths, too, grew ever grander, more ornate, and more complex, encompassing more and more aspects of social interaction and insinuating themselves more deeply in the daily habits of the Romans. As civic centres, the baths came to be considered one of the defining features of Roman civilization to the extent that the history of the empire can hardly now be imagined without them.

The aqueducts became ingrained in the identity of the city, woven into the built fabric, the texts of conversations, and the norms governing civilisation. Though laws were effected to prevent anyone from tampering with or altering the aqueducts, their marriage with the city walls; the threading of their pipes beneath the streets; the overpowering weight, noise, and grandeur of the *castella*; the pooling of water, people, and activity around the fountains; the distinction offered by access to the more coveted waters; and the ritualization of bathing, entrenched the aqueducts in every aspect of ancient Roman life, altering the populations, activities, and spaces they came in contact with instead. Recognising this subtle but pervasive influence, the rulers of Rome used the aqueducts to guide not only the movement of water but of their citizenry and of the structure and growth of the city itself, the persistence of their arcades, castella, fountains, and baths, testifying to their profound and lasting impact.

A Brief Chronology of the Aqueducts

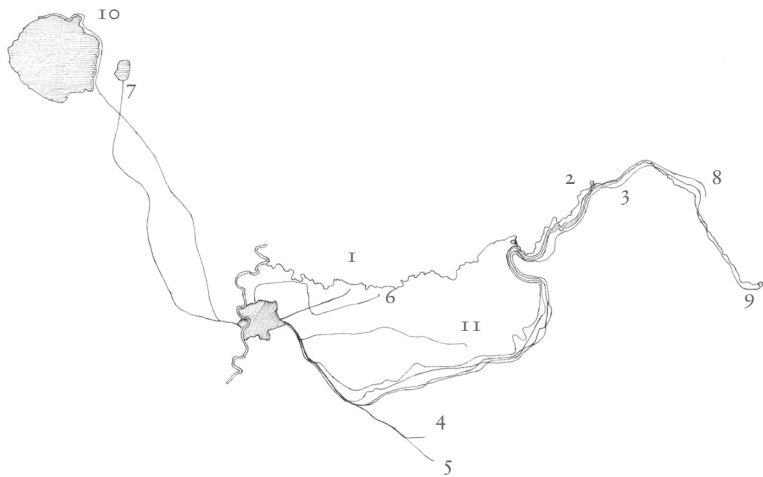


fig. 84. The sources of the aqueducts and their routes to the city.

Rome, as defined by the Aurelian Walls, is the terminating point of 11 aqueducts. In order of construction, they are the: 1) Aqua Appia, 2) Aqua Anio Vetus, 3) Aqua Claudia, 4) Aqua Tepula, 5) Aqua Iulia, 6) Aqua Virgo, 7) Aqua Alsietina, 8) Aqua Claudia, 9) Aqua Anio Novus, 10) Aqua Traiana, 11) Aqua Alexandrina

Beginning in the fourth century BCE, as the population of Rome rapidly expanded, the Tiber and inner city springs were fast becoming insufficient to supply the city's water. The senate embarked on a program of construction to bring new sources from springs in the hills to the east of Rome. The first aqueduct, the Aqua Appia—named for Appius Claudius who after constructing the Via Appia extended his term as censor to see his aqueduct to completion—wound its way underground to Rome, arriving at the lower reaches of the Aventine Hill in 312 BCE. Forty years later, the Aqua Anio Vetus was completed, drawing its water from the River Anio (now Aniene). It too carried its supply underground, terminating in the city near the Porta Esquilina. More than a hundred years passed before any further expansion was made to Rome's water in-

frastructure. After repairing the existing aqueducts, from 140 – 144 BCE the praetor Quintus Marcius Rex oversaw the construction of the Aqua Marcia. Drawing water from springs located to the east of Tivoli, the Marcia followed a winding route of more than 90 kilometres to the city, arriving for the first time above ground, traveling the last 11 kilometres on a string of arches over the southeastern campagna to the Capitoline and, owing to its elevation, able to serve all of the other six hills of the city as well. The Marcia was followed, and surmounted, less than twenty years later by the Aqua Tepula which drew its water from springs near Tusculum, linking into the existing system from the southeast. Agrippa's Aqua Iulia arrived after almost a one hundred year lull in water supply improvements, finding its sources in the same region as the Tepula and, after traveling four kilometres on its own, linked into the same route, riding the same arches in yet another superimposed channel. Agrippa built the sixth, and one of the most famous aqueducts, the Aqua Virgo, in 19 BCE, routing it from its source in the east to skirt the River Anio and enter Rome from the north. After Agrippa's death, Augustus commissioned yet another aqueduct, the Aqua Alsietina, sourced from the lake of the same name (now Lago di Martignano) located to the northwest of the city, to feed his *nau-machia* in Trastevere. Fifty years passed before Claudius completed both the Aqua Claudia, begun during the reign of Caligula, and the Aqua Anio Novus, the former taking its water from the Caeruleus and Curtius springs near the River Anio and the latter, like the Anio Vetus, from the river itself. Though carrying water to the city from farther away than any of the previous aqueducts, the routes of the Claudio and Anio Novus were comparatively shorter, cutting more often through the hills in tunnels and across the valleys on arches. The Aqua Traiana, built after more than another fifty years in 109 CE carried water from the lake Sabatinus (now Bracciano) to a distribution point on the Janiculum. The last of the ancient aqueducts was built more than hundred years later by the last Severan emperor, Alexander Severus, in the early third century, drawing water from marshes in the east to feed the rebuilt baths of Nero in the Campus Martius.⁷³

73 Kleijn, 10-29, Morton, 28-31

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