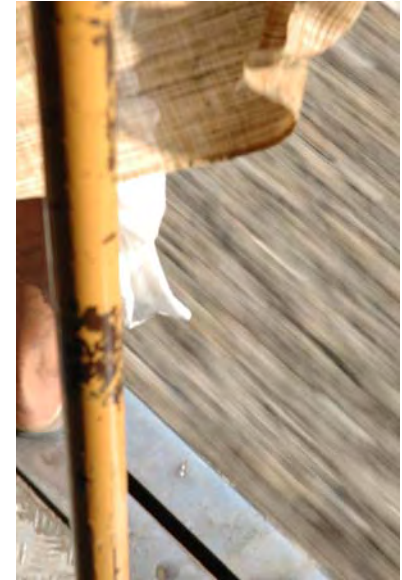


YUKIKO M. BOWMAN : JOHN K. BRANNER TRAVELING FELLOWSHIP PROPOSAL



the ACTof route: reading and recording the world city in motion

I often see flowers from a passing car
That are gone before I can tell what they are.
I want to get out of the train and go back
To see what they were beside the track.
Was something brushed across my mind
That no one on earth will ever find?
Heaven gives its glimpses only to those
Not in a position to look too close.¹

¹ Robert Frost, "A Passing Glimpse," in *Complete Poems of Robert Frost* (New York: Henry Holt & Co., 1949), 311. Cited in Mitchell Schwarzer, *Zoomscape: Architecture in Motion and Media* (New York: Princeton Architectural Press, 2004), 56.

STATEMENT OF INTENT

"The bio-vehicular, electro-commercial, socio-electronic, and opto-ocular metropolis knows no steady state. In a city predominately constituted of motion and temporalities, space itself is about deformation and velocities – *constantly being carved out in front of one and abandoned behind ...*"²

Transit defines the contemporary city. From billions of daily commuters to worldwide business travelers and sightseeing tourists,³ the movement of people along infrastructural linescapes⁴ such as flightpaths, railways, and highways has radically changed the morphology of our environments and our perception of distance and locality. Once limited by the mammalian muscles of ourselves and our animals, our connections to other places and populations drastically expanded with the development of mechanized travel. Transportation networks, initially linking remote communities to one another, now enable a vast system of human movement across neighborhoods, cities, regions, and around the globe.

I will examine these transportation linescapes across multiple scales using a *zoom-in* technique, the collective of which will constitute a branching global *dérive*. Beginning with the global flight path and the world city⁵ as the node that services this linescape, I will *zoom-in* on progressively slower, more intimate transportation modes within the world city, from the rail line, to the bus route, and pedestrian path. In this way, I will understand the world city as a system in motion, simultaneously operating for both travelers and a city's inhabitants across multiple scales.⁶

It is important to acknowledge, however, that it is not only human movement that has brought about the emergence of the world city. The spread of capital investment and information technology have both been pivotal in cultivating what Manuel Castells has called the 'space of flows' in which cross-national networks redefine the boundaries of economic, political, and social activities.⁷ Yet, the 'space of place' has not disappeared within the world city, and the juxtaposition of the two can result in jarring glocalizations. Thus, the world city is a paradox. It is predicated on a smoothing of difference that allows the world city to become a navigable node within a network that transcends locality, while simultaneously reinforcing geographic and cultural particularities through its simultaneous existence *vis a vis* such universalizing flows.

Travelers' behaviors exacerbate this performance of the world city's paradoxical identity, reflecting a dependence on travel books that direct us to sites which are predestined to fulfill the city's image. This devotion to the travel guide as a means of *knowing about*, and transportation as a means of *going to*, limits the

² Lars Lerup, "Stim & Dross: Rethinking the Metropolis," *Assemblage* 25 (1995): 83-101, 86.

³ The 'travel and tourism' industry comprises 11.7% of the world's GDP and 8% of its employment. Mimi Sheller and John Urry, "Places to play, places in play," in *Tourism Mobilities: Places to Play, Places in Play*, ed. by Mimi Sheller and John Urry (London: Routledge, 2004), 1-10.

⁴ Anthony Hoete, ed. *Roam: Reader on the Aesthetics of Mobility* (London: Black Dog Publishing, 2003), 12-13. Hoete defines *linescapes* as the infrastructural routes along which modes -- the 'vehicle for mobility' of bodies, goods, and information -- operate. Modes are nothing new, but multi-modality -- the (often simultaneous) juxtaposition of more than one means of transport -- is increasingly complex and varied in contemporary society.

⁵ The term world city is not uncomplicated and much has been written on what, exactly, the term indicates but for the purposes of my proposal I define it as a major metropolis that has considerable engagement with other cities in global finance, transport, industry, culture, and politics.

⁶ According to the United Nations Tourist Organization (UNTO) a tourist is a person who travels from place to place, stays more than one night but less than a year, and includes business and convention travelers. I will use the term 'traveler,' however, to indicate this same population of people. Cited in OMA, Koolhaas, and Bruce Mau "The Generic City" in *S,M,L, XL*, ed. by Jennifer Sigler (New York: The Monacelli Press, 1995). 1258.

⁷ Manuel Castells, "The Space of Flows," in *The Rise of the Network Society*, vol. 1 in *The Information Age: Economy, Society and Culture* series (Cambridge: Blackwell Publishers, 1996), 376-423.

traveler's role to that of detached consumer of place, always moving *through* only to arrive *at*. In this paradigm, the rail and the road "turn the subject into a passenger..." who absentmindedly 'kills-time.'⁸ When the space of transit is treated as a *non-place*, devoid of social and geographic significance, our understanding of the world city becomes a static bird's eye media image or a disjointed collection of discrete sites.

The *zoom-in* as a route generating technique will allow me to actively re-examine this relationship between traveler and transit within the site of the world city, and will perform in three different realms across diminishing scales in each:

1. **Zoom-in along the linescape**, from airline flight path down to railways, bus routes and sidewalks

*"...the dweller must act in order to see. Architecture comes alive in action."*⁹

This will allow me to re-examine the traveler's route by establishing an active conversation between person (myself) and place,¹⁰ deconstructing conventional subject-object dichotomies and enabling a *practice* of the unofficial city.¹¹ This *zoom-in* will also elucidate at what level the world city in transit gives way to particular local practices.

2. **Zoom-in on the node**, from international airport to neighborhood building

*"Connections are the very raison d'être of cities."*¹²

This will allow me to understand how the world city simultaneously operates at multiple built and symbolic scales from within the spaces of transportation infrastructure. I will look specifically at how the structures that define the nodes (airport, train station, bus stop) negotiate transitions from linescapes to the established built surroundings.

3. **Zoom-in on perceptual representation**, from GPS mapping to video, photography, and sketch

*"There are scales which seem proper to different kinds of motion..."*¹³

Mitchell Schwarzer coins the term "*zoomscape*"¹⁴ to refer to the "overall arena of transformed architectural perception brought about by industrial technologies of motion and media".¹⁵ I will use various recording technologies to correspond to different modes of transportation in order to investigate certain perceptual qualities of the *built city* as viewed from within varying speeds of movement infrastructure.

⁸ Anthony Hoete is discussing Marc Augé's theory of the *non-place*; see Marc Augé *Non-Places: Introduction to an Anthropology of Supermodernity* (London: Verso, 1995).

⁹ Lars Lerup, *After the City*. (Cambridge: MIT Press, 2001), 113.

¹⁰ It is this active feedback between place and psychology that the flaneur sought to uncover via the psychogeographic *dérive*. In the *dérive* unofficial, subversive, and experiential cues generate a route of 'organized spontaneity' that recognizes that 'cities are born from interferences of situations'. Simon Sadler, *The Situationist City* (Cambridge: MIT Press, 1998), 78-79.

¹¹ Michel de Certeau, *The Practice of Everyday Life* (Berkeley: University of California Press, 1984), 93.

¹² Peter J Taylor, *World City Network: A Global Urban Analysis* (London: Routledge, 2004). 1-2.

¹³ Robert Harbison, "The Mind's Miniatures: Maps" in *Eccentric Spaces* (Boston: David R. Godine, 1977). 133.

PARTICIPATION

Preceding my itinerary, I will also contact the transit agencies and architecture schools in the cities I visit in order to schedule a meeting and/or interview while there.

CREATION

Upon return I will create a graphic representation of *The World As City*, which will be comprised of recorded routes from around the world in video, photography, and sketch.

The research and recordings I have gathered will also inform my thesis project: the design of a new commuting system that stitches BART, highway, and analog path together, interspersed with nodes of interchange between the three. Since the commuter naturally understands the city through a series of *zoom-ins* that occur between home and front door, the knowledge I gain from experiencing transit systems around the world will aid in my own understanding of transit potentials in the Bay Area.

*"Yet the flow encourages, the speed comforts, the ride heals."*¹⁶

¹⁴ Schwarzer 17.

¹⁵ Schwarzer 17.

¹⁶ Lerup 1995, 94.

METHOD

As we navigate through space at increasing speeds, our relationship to architecture becomes more visually oriented, granting greater visual consumption of our landscape while also limiting our haptic interactions with the objects of our distant gaze.¹ Moreover, as speeds increase, the near-at-hand becomes an increasing blur while that which is distant is seen more clearly in what Wolfgang Schivelbusch terms 'panoramic perception.'² The mode of travel – airplane, train, automobile – also configures the intimate movements of our heads and bodies, directing the orientations of our gaze upon the landscape through varying window frames, seating arrangements, levels of control, and through the configuration of the linescape itself.³

The perception of space as viewed from within the moving train compartment or the car is paralleled by the development of dynamic media technologies that allow movement itself to be visually captured. Such films as Lalouch's *C'était un rendezvous* evoke what Lars Lerup describes as the 'optic pouch' of the mobile subject: a perceptual suggestion of a constantly changing urban ecology punctuated by distant 'stims' that hold our gaze for an eternal second.⁴

On the following pages, I have elaborated on the specific elements that comprise my *zoom-in*, with relevant questions to be asked and methods of recording to be used at each stage. It is my intention to not overly predetermine the nodes and linescapes which I will follow in each city; therefore, this method is meant to be a neutral framework which I will adjust according to the idiosyncratic demands of each city's transportation system and scale.

Once chosen, the routes will be repeated several times, first to gain an overview and an adequate continuous recording, then in multiple segments so as to allow time for stopping at nodes and investigating and recording sites within the urban neighborhood. A single *zoom-in* route could take up to a week depending on how many nodes I define along the route.

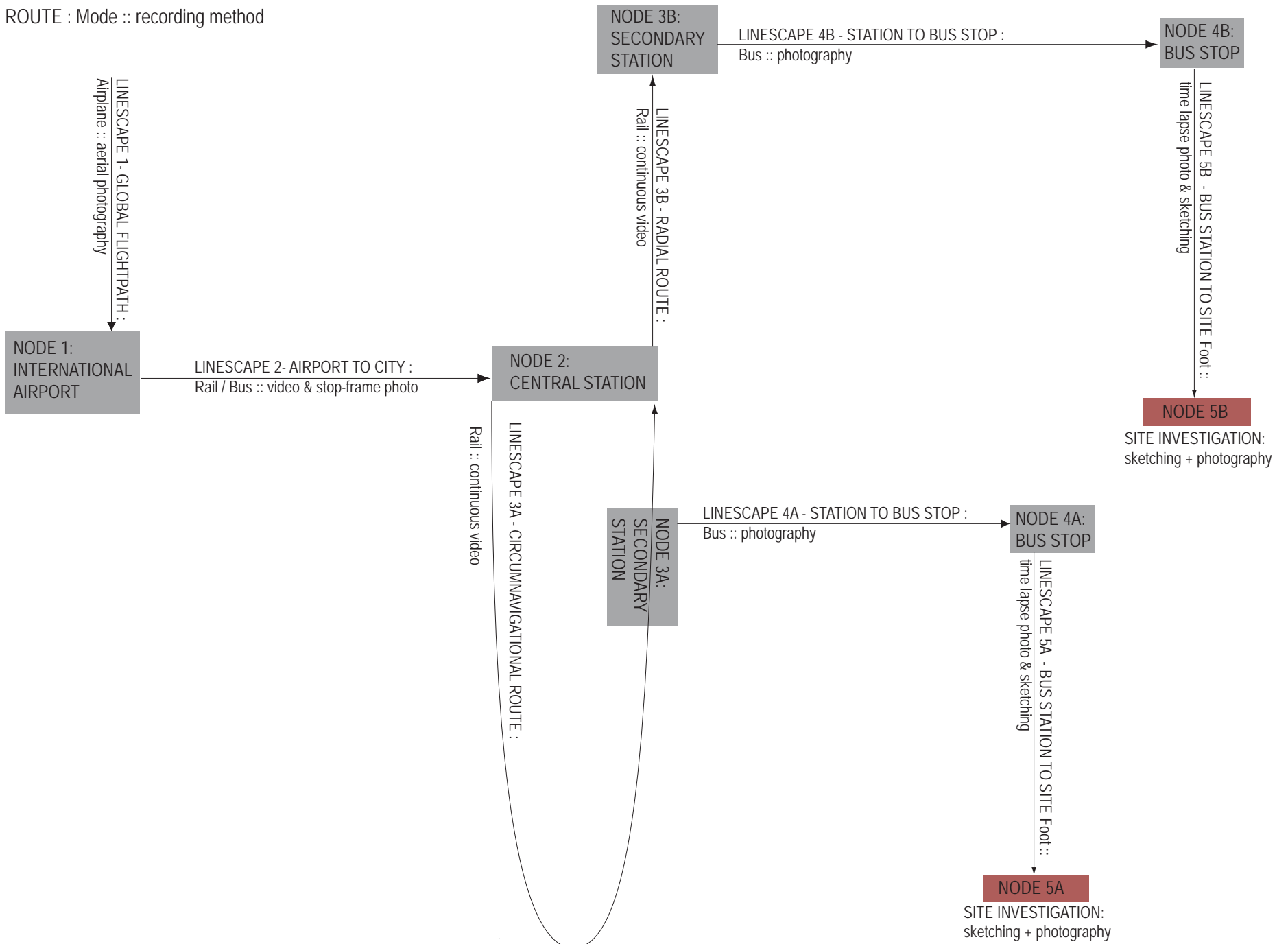
¹ For more on the perceptual experience from the highway see Donald Appleyard, Kevin Lynch, and John R. Myer, *The View from the Road* (Cambridge: MIT Press, 1964).

² Wolfgang Schivelbusch, *The Railway Journey: Trains and Travel in the Nineteenth Century*, trans. Anselm Hollo (New York: Urizen Books, 1979) 57-72; cited in Schwarzer 52.

³ For example, an elevated train route allows us to behold the rear facade of industrial buildings, denies access to building facades, and gives witness to roofscapes and what Grady Clay might call ephemeral places that are "transitional, evolving, emerging." Grady Clay, "Megalopolis in Passing: The Function of Ephemeral Places," *Mass*, vol. 7 (Fall 1989): 2-6.

⁴ Lerup 1995, 86 & 94.

ROUTE : Mode :: recording method



LINESCAPES

1. Global flight path via airplane : aerial photography

Sensory aspects : extreme distance from ground, extreme speed, highly controlled and limited physical interior with apparent bodily stasis

Perceptual aspects : bird's eye view, visually abstract surfaces of color and line indicate land-use patterns, large-scale infrastructure, topography, density of development

2. Airport to major rail station via rail : continuous video

Sensory aspects: varying relationship to groundplane, varying speed as stations are approached, seat configuration determines body spacing and eye-contact

Perceptual aspects : large side windows emphasize horizontal movement, 'panoramic perception' with near-object blur and distant formal clarity, corridors often reveal 'backsides' of buildings, roofscapes, section through ground as train tunnels or emerges

: How does route from airport to city distinguish arrival into city?

: Are there multiple airport to city public transit routes, and do the users differ?

3a. Circumnavigational rail route : continuous video of city 'section'

: Is there a city 'centre,' and how does the city change around it?

3b. Radial rail route : continuous video of city 'section'

: Does the city express a change as it moves radially from the geographic center?

*(*nb as some cities never really end, I will give myself a continuous 1 hour time limit on a rail route during my initial route survey).*

4a/4b. Secondary station to bus stop via bus : stop motion photography

Sensory aspects: bodily engagement with street topography, frequent stops

Perceptual aspects: varied views as passenger, from perspectival forward view through windshield to horizontal side-views to rear-window receding views

: How well connected are secondary layers of transport connected to the primary layer? Are these layers even hierarchical?

: Are there opportunistic transit systems outside of those officially provided?

5a/5b. Bus station to site / commuter destination via foot : time lapse photography and sketching

Sensory aspects: body's engagement with material underfoot, full control of direction of movement, limited scope of distance

Perceptual aspects : vision unframed in all directions, building scale as measured against own height, non-visual stimuli, intimate detail revealed, distant objects apparently static

: How is transition between interior/exterior space negotiated between the streetscape and surrounding buildings?

: How foot- friendly are the pedestrian linescapes? How much activity takes place on the sidewalk or in the street?

NODES

Node 1: International Airport

The airport is a site of much theoretical discussion. Rem Koolhaas writes about the double-identity of airports, which are both “hyper-global in the sense that you can get goods there that are not available even in the city, hyper-local in the sense that you can get things there that you get nowhere else,”¹ while Augé identifies them as the epitome of the *non-place*. International air travel demands a high level of physical and logistical standardization and control, and yet it is precisely because of this that the differences between airports may be the most revealing indicators of *placefulness*.

: How does the airport distinguish itself as the gateway of the world city through its architectural elements and symbolic signifiers?

Node 2: Central Station

Usually the major rail stations in a city are navigated by both commuters and travelers alike, and serve not only as linescape hubs but as information hubs and meeting sites.

: What are the busiest rail routes within the city?

: What are the primary circumnavigational and radial routes, and do these routes serve different populations (ex. commuter vs. traveler)?

: How does the architecture of the station interact with the surrounding cityscape?

Nodes 3a & 3b: Secondary Stations

There may be several of these along each linescape 3a & 3b. There will be two determinants as to which stations become nodes along linescapes 3a & 3b; however, each is meant to signify a *reason to disembark* – either my own perception, or the noticeable movements of those around me.

1. Perceptibility -- subjective view of self as traveler

Using myself as a test case, I will seek out the most notable site as perceived from the linescape, and will disembark at the closest station. These landmarks may not only be monumentally-scaled buildings, but may be pronounced edges, voids, multiplicities, or striking cityscape-topographic interactions. In some cases these landmarks may even intentionally communicate with the linescape, as in the case of the signage in Las Vegas,² meant to communicate with the driver on the strip, or in the case of the advertising along Tokyo's dense urban rail corridors.

: To what degree does perceptual communication exist between infrastructural linescapes and the cityscape?

2. Flow volume -- self as vicarious commuter

Observing other transit users, where flow volume of disembarkation is particularly great I will also ‘follow the crowd,’ so to speak, in order to understand what element(s) in the nearby locale are generating their movement. In some cases it might be an entire district, such as a CBD, or it might be a discrete architectural ‘event’ such as a baseball stadium on game day.

: Where do people go upon immediately exiting the node? Do they transfer to other linescapes or enter the built cityscape?

The use of both of these indicators is meant to put me in the role of both traveler and urban commuter.

¹ OMA, Rem Koolhaas, and Bruce Mau “The Generic City” in *S,M,L, XL*, ed. Jennifer Sigler (New York: The Monacelli Press, 1995). 1238-1267, 1251.

² Robert Venturi, Denise Scott Brown, and Steven Izenour. *Learning from Las Vegas* (Cambridge: MIT Press, 1977).

Node 4: Bus stop

If I have left the rail system with a flow of commuters, I will continue to observe and follow this movement. If I have left the rail system due to a perceived landmark, where scale allows, I will utilize an automobile transit system (bus or taxi). Where a bus system is used, I will record the architectural configuration of bus stops, noting levels of standardization, seating configurations, shelter, and engagement with the street and sidewalk.³

Node 5: Site as self-perceived or as commuter destination

I will spend a significant amount of time recording, via extensive sketching and photography, the final site of the *zoom-in*, observing architectural elements such as material, interior and exterior circulation, contextualization within the greater environment, transition to the streetscape, public and private space, and perceived use.

³ Joe Moran suggests that the bus stop, and the way people wait while at them, is such a universally quotidian experience from which social differences can be read. Joe Moran, *Reading the Everyday* (New York: Routledge, 2005).

ITINERARY

"Is the contemporary city like the contemporary airport – 'all the same'?"¹

I have chosen to examine transit linescapes via the *zoom-in* in 11 different cities based on these factors:

1. The city's designation as a world city, and within this, its manifestation of varying levels of 'world city-ness' as determined by the GaWC (Globalization and World Cities Research Group and Network). Using data on the presence of firms in four economic sectors (accountancy, advertising, banking/finance, and law), the GaWC established four categories of 'world city-ness': *alpha*, *beta*, *gamma*, and *evidence of world city formation*. I have chosen cities from each of these groups.²
2. Service by a major international airport and the presence of a well-established mass-transit system that contains multiple modalities (rail, bus, etc.)
3. Geographic diversity

I will stay approximately 3 to 4 weeks in each city, spending the first week doing surveys of major linescapes, and the next three weeks performing several *zoom-ins*.

¹ OMA, Rem Koolhaas, and Bruce Mau "The Generic City" in *S,M,L, XL*, ed. by Jennifer Sigler (New York: The Monacelli Press, 1995). 1238-1267. 1248. Koolhaas slightly contradicts himself here, however, claiming also that airports become more differentiated as cities become more generic.

² Peter J. Taylor, D.R.F Walker, and J.V. Beaverstock, "Firms and Their Global Service Networks," in *Global Networks, Linked Cities*, ed. Saskia Sassen (New York: Routledge, 2002), 93-116.

January

February

March

April

May

June

July

August

September

October

November

MUMBAI

HONG KONG

BANGKOK

SINGAPORE TOKYO

PARIS

MILAN

MOSCOW

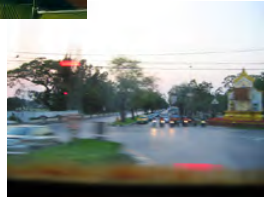
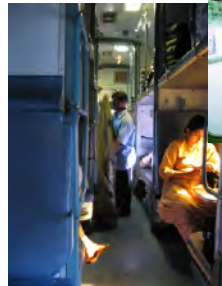
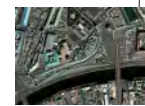
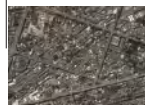
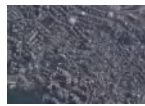
JOHANNESBURG

MEXICO CITY

SAO PAULO

break

break



ALPHA CITIES

HONG KONG

Pop. Density: 6,295/ km²

No. major cities that fly direct service: 48

Mileage of rail lines: 168 km

Ridership in a single year of transit: 825 million

Over 80% of the land in Hong Kong is hilly, leaving only 15.6% for built-up territory. The rest is uneven woodland and scrubland, unsuitable for development. Therefore, reclamation from the water's edge has been a source of land supply; since WWII 3,600 hectares of land have been created as a result of infill. The city has been an important trade region since the 10th century, and remains export-oriented, with major services in finance and banking. Its reliance on imports for raw material and consumer goods makes it highly susceptible to the economic climate of western industrial nations, in particular the U.S. It is currently China's richest city, with a highly liberalized economy, and it hosts the Asian headquarters of many multi-national corporations.

Hong Kong has had a history of contested sovereignty; it was ceded to Britain during the Opium Wars of 19th century, and became crown colony in 1843. It suffered Japanese occupation for four years during WWII, and upon liberation has since experienced a high rate of immigration from the mainland. On July 1, 1997, it was ceded back to the PRC as a special administrative region (SAR); under the terms of the Sino-British Joint Declaration, the PRC promised that Hong Kong will have a relatively high degree of autonomy until 2047. It retains own legal system, currency, customs policies, sports teams, immigration laws, cultural delegations, and even road rules, driving on the left.

The city has 2 metro systems: the privatized Mass Transit Railway (MTR), which operates 7 lines, and the Kowloon-Canton Railway (KCR), which links Hong Kong to the mainland and operates light rail in the northwest. The MTR corporation develops properties adjacent to rail corridors, creating integration into housing estates and shopping centers, and since its privatization many stations increasingly boast retail outlets. The city also has the world's only double-decker tramway system, which covers the northern regions. Five separate companies operate franchised public bus services; the fleet contains double-decker buses, still in use. The airport, which acts as a hub for Southeast Asia, has three links to the city itself : the Airport Express rail, City Flyers, and Airbuses. Specialty rail stations service the new Disneyland Resort, and the Asia World Expo center at Hong Kong International Airport.

SINGAPORE

Pop. Density: 6,389/ km²

No. major cities that fly direct service: 60

Mileage of rail lines: 109.4 km

Ridership in a single year of transit: 1.3 million on MRT, 2.8 million on bus network

Rem Koolhaas claims that Singapore is the tabula rasa extraordinaire, having developed in an astounding 40 years as “the brainchild of one man: Lee Kuan Yew.”¹ Geographically limited in size, the island was razed, and much of its topography became infill to increase land area by nearly 100 km². A 1963 UN report delineated Singapore as “the first Asian city to embark on a programme of Urban Renewal...This programme is not intended to be an exercise in conservation or restoration but a bold attempt to modernize and develop the city centre in preparation for the role Singapore will have to play...”² The nation-city had a long tradition of free trade due to its strategic location on the southern tip of peninsular Malaysia; it is still the 2nd busiest port in the world and is a powerful international finance center with high levels of foreign direct investment.

Over 90% of the population lives in estates built by the Housing Development Board. Many of these estates are directly serviced by the Light Rapid Transit system, exhibiting a tight-fit between transit and residential planning. The main rail is the Mass Rapid Transit, which began in 1987 and which is the second oldest metro system in Southeast Asia. It boasts 3 lines, although a Circle Line is under construction. Both the LRT and MRT are run by government assisted, profit-based rail operators. Most of the system’s underground stations were built deep enough to serve as bomb shelters. The city is also served by a network of expressways, and an extensive national bus system. Since 1998 Singapore has engaged in a policy of road pricing whereby electronic tolls are levied on cars driving into the CBD during peak commuting times. While some traffic planners hail this as a successful incentive for reducing downtown traffic congestion, it could also be argued that it filters out cash-poor commuters, leaving more room (and thus easier, speedier access) for those wealthy commuters who are willing to pay the tax, turning such roads into ‘premium downtown road space.’³ In a truly competitive gesture, Hong Kong will be implementing a similar scheme on its downtown streets for fear that corporate CEO’s will choose Singapore’s smoothly flowing streets over Hong Kong’s gridlock. Singapore’s Changi International Airport is a major transportation hub between Europe and Australia/New Zealand.

TOKYO

Pop. Density: 13,500/ km²

No. major cities that fly direct service: 67

Mileage of rail lines: 292 km

Ridership in a single year of transit: 2.819 billion

Percentage of population that utilizes public rail: 49%

Tokyo is one of the world’s most populous metropolitan areas, and is considered to be one of the top three finance centers in the world, along with London and New York. It has been the *functioning* capitol of Japan since the early 1600’s, topping a population of one million by the 18th century and making it one of the largest cities in world at the time. It became the official capitol when the emperor moved there in 1869, although it was already the political and economic center since the early 17th century, when the Shogunate made it his center of operations. The city has largely been rebuilt since WWII, when it was virtually flattened; rapid development since the 60’s and 70’s has brought numerous high-rises, and the controversial Narita airport.

¹ OMA, Rem Koolhaas, and Bruce Mau “Singapore Songlines” in *S,M,L, XL*, ed. by Jennifer Sigler (New York: The Monacelli Press, 1995), 1008-1089, 1013.

² Charles Abrams, Susumu Kobe, and Otto Koenigsberger, “Growth and Urban Renewal in Singapore” (report to the UN, 1963) 7 & 109. Cited in “Singapore Songlines” 1025.

³ Graham and Marvin, 313.

Tokyo's urban rail system is one of the most extensive in the world, with 168 stations, the world's busiest being at Shinjuku. The rail system is comprised of both private and public networks operating simultaneously. The metro system is run by the privatized Tokyo Metro Co. and the public Tokyo Metropolitan Bureau of Transportation, which currently retain separate ticketing systems, mapping systems, and platforms. A universal pass allowing seamless access across systems will be introduced in 2007, however. Several other rail networks also service the city, including those run by the national Japan Railway, and private lines associated with major department stores such as Keio, Tobu, and Odakyu. Many of the major stations are connected to department store entrances, and the underground retail network is vast. Due to the large numbers of commuters, the population of the city proper swells by over 2.5 million people during the day.

PARIS

No. major cities that fly direct service: 119

Mileage of rail lines: 213 km

Ridership per year: 1.336 billion

Between 1853 and 1870, Haussman's plan to cohere the street network of Paris into an integrated system was the epitome of technocratic rationalism. The system of boulevards that carved through the medieval fabric of neighborhood Paris were, in his words, meant to "regularize the disordered city...by means of a pure, schematic layout..."⁴ that heralded Paris' status as an exemplar of modern planning. Today the city's global power lies in its service, finance, tourism and manufacturing industries.

France's national rail network, which began in 1848, began Paris' tourism industry in earnest, aided by the universal expositions which helped to herald the opening of the city's metro in 1900. With the post-WWII population boom the RER, which services the peripheral suburbs, and the Peripherique Expressway which circumnavigates the city, also went into operation. Since the 1970's, the once-booming suburban estates have largely de-industrialized, leaving high rates of unemployment. However, the city proper is witnessing its first population rise since 1954. Strict building codes limit development, however, so many institutions are locating in the suburbs.

MILAN

Pop. Density: 6,988/ km²

Mileage of rail lines: 85 km

Milan is Italy's largest city, the seat of the Italian stock exchange and one of the EU's richest countries. It gains its fame as a cultural, fashion, and opera capitol, and has long been a center for silk production. It is also the base of operations for many national communication operations such as newspaper, radio, magazines, and TV. As a testament to its style, Massimiliano Fuksas' Fiera Milano, located in northwestern suburb of Pero, opened in 2005. At the time of its building, this was Europe's largest construction project and is the largest trade fair complex in world. The city is a combination of both an old and new built cityscape, having lost up to 30% of its buildings during WWII bombings.

⁴ Stephen Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001), 55.

The Malpensa International Airport (MXP) in the northern suburb of Busto Arsizio connects to downtown Milan via the Malpensa Express Rail. This airport, plus 2 smaller airports in the city's vicinity, make Milan Italy's hub for passengers and cargo. Three rail systems serve the city: the subway metro, which has 3 lines (Metro- M), the Urban Railway Service (Metro –S), and the Suburban Railway Service (S), which has 8 lines, plus 10 more scheduled for 2008. The Regional Railway trains (R) link Milan with the rest of Lombardy and connect to the national rail system. Milan's five major rail stations are among Italy's busiest, with 2 more under construction. The city also has more than 93 bus lines. Milan also has one of the most extensive tramway systems in the world, with 286 km of track and 20 lines.

BETA CITIES

MOSCOW

Pop. Density: 8536/ km²

No. of cities that fly direct service: 102

Mileage of rail lines: 278 km

Ridership in a single *day* of transit: 7.1 million

Moscow is currently Russia's capitol, was also the capitol of the former USSR (dissolved 1991), and of pre-Imperial Russia. Located in the western part of Russia on the European continent, along the Moskva River, it is usually considered to be a European city. It houses 7% of the Russian population, and is one of the most populous cities in Europe. It has enjoyed a relatively stable population expansion from the 14th century on, due to its position on the Volga headwaters, although it has also seen periods of considerable turmoil. When Napoleon invaded in 1812, Muscovites burned their own city; it was a prime site of the Russian Revolution of 1917, after which it was reinstated as the capitol, and during 1941 the city came under siege as part of WWII (although Stalin and his general staff remained in the city). Under Stalin there were large-scale efforts to modernize the city; broad avenues and roadways were created, sometimes over 10 lanes wide. Such undertakings destroyed significant architectural works but Stalin also instituted his own major works, for which 'Stalinist gothic architecture' style derives its homage. Currently the city is an important center for the country's media and science industries, with important industrial activity in chemicals, metallurgy, food, textile, furniture, and machinery. There are many multi-national corporations within the city, and a shortage of office space is causing former industrial and research facilities to be reconstructed for office use. Moscow is also infamous for its billionaires; in 2004, Russia's 36 billionaires (34 of whom live in Moscow) held 24% of the country's GDP.

5 airports serve Moscow; Sheremetyevo International Airport is the most common entry point for foreign passengers, and handles 60% of all international flights. Moscow is the terminus of the Trans-Siberian railway, which travels 9300 km east to Vladivostok; the city also has 2 passenger river terminals, three freight ports, and a major bus terminal. The metro system began in early 1930's, with construction continuing throughout WWII. The system is famous for its murals, mosaics, and chandeliers, and operates 12 lines, mostly underground, with 171 stations. The Victory Park station is the deepest in the world, and the entire system is one of the world's busiest, serving 7 million passengers on an average day. During peak hours the trains run roughly every 90 seconds on most lines, obviating the need for schedules. Stations outside the city center are farther apart, so an extensive bus network radiates from each station to surrounding residential zones. Buses are very frequent, and every large street in the city is served by at least one bus route. Suburbs and satellite cities are also connected by a commuter

electric rail network. Recent years have seen explosive car growth, causing traffic jams along the road system, which is centered around the Kremlin. The main roads are organized radially and intersect with 5 major circular rings.

MEXICO CITY

Pop. Density: 5,741/ km²

Mileage of rail lines: 207 km

Ridership in a single year of transit: 1.442 billion

Now the capitol and largest city of Mexico, Mexico City was founded in 1521 by Cortés on the ruins of the Aztec Empire. From 1525 to the early 19th century, the city served as the viceroyalty of New Spain, and was the political and cultural center of Mexico. The city was so important that other colonial holdings (Guatemala, Cuba, Florida and the Philippines) were administered from it. The country gained independence in 1821, and the Mexican Federal District (near the city's old centre) was established in 1824. Although the current capitol is officially sited in the Federal District, the boundaries of the metropolitan area extend far beyond the District itself. Much of the population growth of the city has occurred only in the latter half of the 20th century, and recent economic growth has made Mexico City one of Latin America's financial centers, producing 25% of Mexico's GDP.

The city is served by a 207 km metro system, which began in 1969, and was one of the first systems to use symbols as signage for illiterate citizens. This system transports more than 4 million people per day, and is heavily subsidized by the government. However, the metro still geographically reaches only a fraction of the city's inhabitants, so an extensive bus networks provides a secondary means of transit. Most of the buses are privately managed. The city has four major bus stations, and one train station used only for commercial purposes, as intercity passenger trains do not service the country which is instead linked by expressways. The city itself is only served by arterial roads, making traffic congestion a problem. In response, a restricted even-odd license plate policy has been instituted on certain days, resulting in wealthy residents owning two cars, boasting both even and odd plate numbers. Mexico City is served by Mexico City International Airport.

SAO PAOLO

*"It is increasingly clear that the most highly valued spaces in global city cores are being provided with their own dedicated, high-quality infrastructural connections. These are configured to maximize the ease of connecting to other global city cores around the world. At the same time they are increasingly organized carefully to filter out unwanted connections with the surrounding metropolis – those that are judged to be 'threatening' or deemed to be irrelevant to the direct needs of the glocal enclave."*⁵

Pop. Density: 7,175/ km²

No. cities that fly direct service: 61

Mileage of rail lines: 62.0 km

⁵ Ibid., 318.

Ridership in a single year of transit: 512 million

Sao Paulo was founded in 1554 by Jesuit missionaries. It officially became a city in 1711, and boomed during the 19th century coffee trade as exports left from the nearby port of Santos. The coffee industry brought waves of immigrants from Italy and Japan who worked on the plantations. It is currently the financial and industrial center of Brazil, although the change in economic profile happened only during the past decade as the city went from an industrial base to a service and technology-oriented base. Sao Paulo also houses the headquarters of several advertising and broadcasting companies. The city hosts numerous international fairs every year, and has specialized regions for garments, lighting equipment, electrical and electronic parts, furniture and musical equipment, designer and label stores, and automobiles.

Sao Paulo represents one of the strongest examples of enclave urbanism in which the city's middle and upperclass are withdrawing into walled communities, removing themselves from the public sphere of the street, sidewalk, and public transit systems. These communities boast their own dedicated energy, water, and telecommunications connections, along with a host of other services which render contact with the rest of the city virtually irrelevant. The most striking manifestation of this withdrawal by the urban elite from the city is the helicopter commute; no longer engaging the public space of rail or road, Sao Paulo's elite have taken to the skies in personal helicopters. At any one time roughly 100 helicopters (or 25% of the total 'fleet') are airborne, for purposes as mundane as running errands. Landing pads have become a common feature of elite residential enclaves.⁶

The city has three airports, and has the most crowded airspace in Latin America. For a city of this size, the metro is relatively small, with only 62 km of railway, 4 lines and 57 stations. However, this system is complemented by another 270 km of rail run by 'Company of Metropolitan Trains' (CPTM). Collectively, the rail systems carry about 3.5 million people on an average weekday. Buses comprise the bulk of public transport, with a fleet of 17,000, all color-coded to indicate the area of the city they serve. Until recently there were also informal vans which are now fully legalized and using the same color scheme.

GAMMA CITIES

BANGKOK

"...all efforts to use infrastructure to integrate the city in a comprehensive manner have been abandoned."⁷

Pop. Density: 4,426/km²

No. major cities that fly direct service: 61

Mileage of rail lines: 44km

Bangkok is the one of Southeast Asia's fastest –growing cities, and is the capitol of Thailand. It is also the country's largest city by a considerable margin, accounting for about 43% of the country's GDP. It is the site of the Stock Exchange of Thailand, the headquarters of most of Thailand's commercial banks and financial institutions, and is also one of the world's most popular tourist destinations.

⁶ Ibid., 283.

⁷ Ibid., 328.

Bangkok is notorious for appearing unplanned despite its western style planning system. Development happens unpredictably and without relation to major transport nodes, spreading outwards with unpredictable 'leapfrog' gaps remaining in central locations. The mass transit system is fragmentary and concessions are being given to private developers to install rail, road (especially private toll highways), and telecommunication lines; often the placement of this infrastructure is based on personal desire to serve certain areas over others such as the lucrative business and residential enclaves that stretch north towards the Bangkok International Airport. Where these lines intersect to create a node, private development companies are looking to develop mixed use theme enclaves ("new towns in town") for affluent residents. These mega-developments have displaced over 50,000 low-income residents to the periphery over the past few years, where they are ill-served by transit infrastructure. Population growth has skyrocketed in the past 30 years, generating opportunistic growth patterns influenced more by the market economy than by planning measures. High-rise buildings are not concentrated, as in most CBD's, making Bangkok's CBD difficult to define.

At one time, all inter-urban transport was done by boat, leaving behind an elaborate system of canals which gave the city the nickname as the "Venice of the East." Most canals have been filled and converted to streets, although some do remain as residential and market sites. Traffic on surface roads is notorious and in response several elevated highways run through the city, along with a partially-finished ring road around Greater Bangkok. In 1999 the 2-line Skytrain metro system was opened, and has since been supplemented by the Bangkok Metro (MRT) which opened in 2004. A failed elevated railroad project has left its highly visible remains; inhabitants call the pillars Stonehenge. Three main bus terminals serve as hubs for intercity bus travel. A new airport has been under construction since 2002, and is scheduled to open soon.

JOHANNESBURG

Pop. Density: 1,962/ km²

No. major cities that fly direct service: 20

Johannesburg is the most populous city in South Africa and the provincial capitol of Gauteng Province, which is the wealthiest province in the country. The city is not, however, the capitol, despite a growing number of government branch offices and consulates locating to the city. Located in the Witwatersrand hill range, the Johannesburg has long had a major gold and diamond trade, although these are more recently being supplanted by steel and cement industries, and banking and commercial services. Initially, however, the discovery of gold and the ensuing gold rush triggered the first major influx of European settlement into what was inhabited mostly by nomadic Bushmen and Bantu tribes. As more Europeans settled, tensions between the Afrikaners and British rose, culminating in the Second Anglo-Boer War, the result of which was cession of the area to the British. The government of the Union of South Africa (1910) instituted forced removals of non-European peoples into specified areas, one of which was Soweto. Apartheid was abandoned in February 1990, and since 1994 discriminatory laws have been abolished. However, integration has been piecemeal; as a growing influx of poor blacks informally settle in the city centre, affluent whites and many of their employers and service providers are retreating to fortified enclaves on the northern periphery of the city. Security-intense planned communities are proliferating in these areas, and sometimes residents will even completely fortify their own towns by sequestering into their enclaves otherwise public infrastructures such as streets and sidewalks.

Johannesburg International Airport is the largest and busiest in Africa, and a hub for international travel to the rest of southern Africa. The sprawling city is geared more towards private automobile transit, although due to the financial burdens of auto ownership, many residents must rely on informal minibus taxis, which are a

transportation backbone for much of the population. Although purportedly dangerous, the minibuses are an essential component of working class transit due to the metro's limited service. The metro system connects Johannesburg to Soweto, Pretoria, and other satellite towns, transporting large numbers of workers everyday. However, the system only covers the southern part of the city, although most urban growth of the past 50 years has been northwards. Metrobus operates a bus fleet of 550 single and double-decker buses, running 84 different routes through the city. The buses carry approximately 20 million passengers per year. Metered taxis are not allowed to scout the city for passengers, and are only available on call. The Johannesburg Ring Road is one of Africa's most famous "beltways," and is frequently clogged with traffic.

EVIDENCE OF WORLD CITY FORMATION

MUMBAI

Pop. Density: 27,220/km²

No. cities that fly direct service: 44

Mileage of rail lines: 308 km

Ridership in a single *day* of transit: 6.1 million

Mumbai is the capitol of Maharashtra state and India's most populous city. The city is located on Salsette Island, has a deep natural harbor, and handles a majority of India's passenger and cargo traffic. Mumbai is also the commercial, financial, and entertainment capitol of India, hosts two stock exchanges, and the headquarters of many of India's larger companies. Portuguese settlers appropriated Mumbai in 1534, ceded it to England in 1661, who then leased it to the British East India Company in 1668. At this time the city's potential as a port was developed, and the population expanded rapidly. Massive engineering projects from the early 1800's merged the previously disjointed archipelago into a unified mass. During the US Civil War, Mumbai was a chief trading port for cotton, and the opening of the Suez Canal in 1869 transformed the city into a thriving seaport. Today state and federal employees comprise a large percentage of the city's workforce, alongside a large pool of skilled and semi-skilled workers.

Traffic and poor road conditions make public transport a necessary part of Mumbai life. The historical (1857) Mumbai Suburban Railway, run by the state-owned Indian Railways' Central and Western Railways subdivisions, is the mainstay of the city's transport, and supports three different networks, two of which run along the city in a north-south orientation and which extend into the exurbs, making each one-way length 125 km. Overcrowding is intense, with rush-hour densities of up to 14 to 16 standing passengers per square meter of floor space. Public buses cover most of Mumbai as well, and are used for short to medium distance commutes, while rail is used for longer distances. Taxis operate in the city while auto rickshaws are allowed to operate only in suburban areas. The Chatrapati Shivaji International Airport is the busiest in India.

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