O N E M E T R O W O R L D

Jug Cerović

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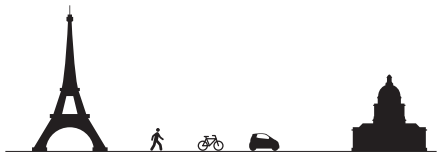
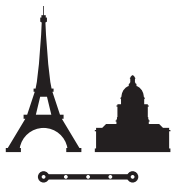
TABLE OF CONTENTS

INTRODUCTION



SURFACE DIMENSIONS



UNDERGROUND DIMENSIONS

SPACE AND TIME

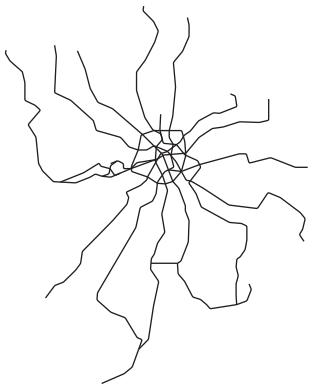
A metro system is much more than a transportation network, it is a parallel universe where space is contracted and time is inflated.

The urban surface world and the subterranean metro world operate entirely independently from each other and are connected solely through a limited number of stations. Only through a station can one pass from one realm into the other.

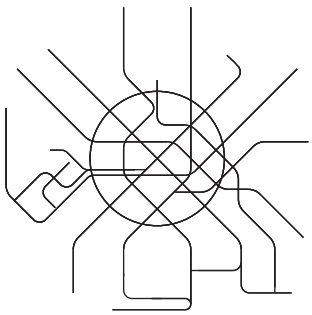
Underground, the city acquires novel dimensions. By travelling on a train that runs straight from station to station without obstacles, one can go much further in a given time or cross a given distance much faster compared with surface travel.

As such, the metro effectively functions as a space and time shortcut within the urban fabric. As far as the traveler is concerned, from the moment they venture underground, the physical space separating stations immediately shrinks while the time at their disposal offers an inflated travel potential.

A metro system thus offers a city a new and parallel dimension, different but nevertheless tightly connected to the physical one by a number of fixed gates. These gates, or stations, are connected by metro services as a part of an underground network of potential journeys. In order to navigate the network, one needs a map that portrays its peculiar context and mechanisms.



PHYSICAL MAP



SCHEMATIC MAP

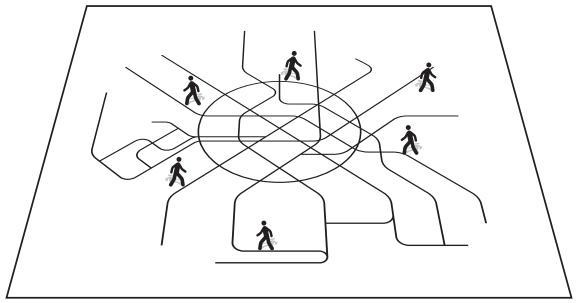
NAVIGATION

The only way to navigate a metro system, from one station to another, is to board a train destined for the targeted station or to board several consecutive trains, thus transferring from one to another if a direct service is not available.

Indeed, the network is composed of a limited number of frequent running services—we call them lines—which connect isolated stations. Some of these stations are served by more than one line and thus allow transfers.

Inside this network, only two categories of space are readily accessible to the traveler: the static stations and the dynamic trains. The entire area between the stations themselves effectively lies beyond reach as it is either solid ground or tunnels that can only be crossed while confined to a train. Consequently, the shape, length, and other physical characteristics of this intermediate space are of no importance whatsoever for efficient navigation; the only necessary information is the way lines connect stations and their relative position to one another. Geography is irrelevant, only connections matter.

Therefore, even though a geographic map of the network can be used for navigation, it overwhelms the user with superfluous information such as precise route shapes and physical distances. By contrast, a schematic map displays only the most necessary information organized in such a way to portray how the system works, not what the infrastructure looks like, resulting in a far superior navigational tool.



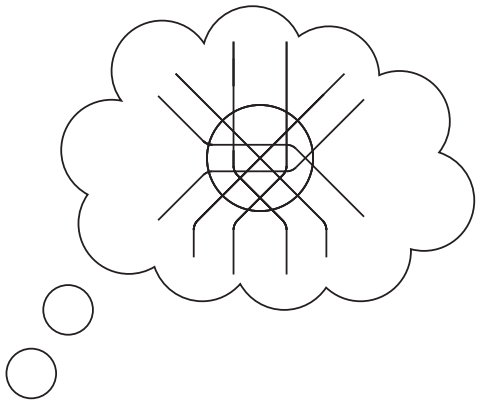
THE MAP IS THE NETWORK

VIRTUAL REALITY

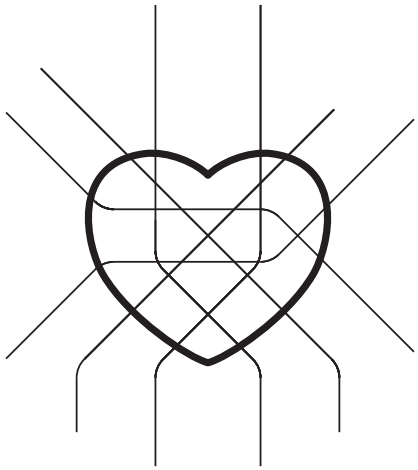
In order to understand a complex street network, one can explore the streets on foot, climb to a high point and embrace a panorama of the city, or consult an aerial photograph.

Understanding a metro network is a different matter. It is impossible to observe it from the outside as most of the infrastructure lies hidden underground. Even when approached from within, its static components—stations—stand isolated and can be explored only one at a time while its dynamic components—trains—are similarly scattered and in almost perpetual movement. Even if one is to board a train and meticulously record all the stations served on the way, one would find it difficult to ascertain the routes and stopping patterns of other trains, even on the same line, as one would be able to board only one train at a time.

Prevented from exploring and understanding a metro system by independent means, a traveler relies entirely on the map for journey planning and navigation. As far as the user is concerned, the metro network has no practical existence as long as it is not graphically represented. Without a map, they are incapable of navigating it. The network thus becomes a tangible reality only insofar as it is portrayed on a map. If a station is erased from the map, it effectively ceases to exist for most users despite its continued physical existence. Paradoxically, the built infrastructure of a metro system remains virtual at all times while its conceptualized representation—the map—becomes its very reality. In a metro system, the map is the network.



MENTAL IMAGE



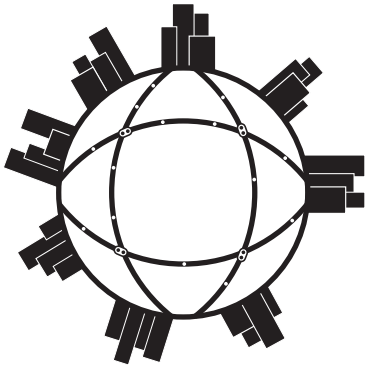
COMMON IDENTIFIER

MAP AND MIND

Since the map really is the network, the reality of the network itself as well as its graphic representation, it is instrumental in the process of shaping a mental image of the metro system. We use the map as our main reference when we think about, navigate, and talk about the system. Very soon it starts crystallizing into an essential shape, seemingly immutable and eternal.

The metro system and the city being closely associated (although belonging to different dimensions) our mental images of the city and of the network constantly influence one another. Our image of the city results from of a great number of influences, from geography and built environments to experiences and emotional responses, whereas our image of the metro network comes primarily from a single source: the map. Hence, those who control the map hold tremendous power over shaping the mental images of both the network and the city. A change of color or shape of a line can have profound consequences not only on ridership numbers, but also on the way the corresponding area of the city is perceived.

From such power comes equal social responsibility as the metro map is one of the few common identifiers urban dwellers share. The metro map is indeed blindly accepted as a neutral, egalitarian, and trustworthy medium by an entire urban population and requires the most cautious and delicate handling.



ONE SYSTEM, ONE LANGUAGE

LINGUA FRANCA

Metro systems around the world are strikingly homogeneous. They share common mechanisms and infrastructure characteristics. Most systems are located underground, trains run on tracks and usually serve a fixed route with constant terminal points while lines are colored and named or numbered. The specific way one uses and navigates a metro system is similar everywhere around the world. Nevertheless, representations of these systems are multiple and as much as they may accurately address local particularities or tastes, they fail to provide a clear sense of belonging to a wider community—a global urban community.

Creating a common language for mapping the underground realm would trigger an immediate perception of this shared paradigm. It would create an open common ground for the exchange of experiences from around the globe.

The mastery of a dedicated schematic language specifically created for the underground world would empower travelers to explore this world further instead of remaining confined to the small portion of it with which they are already familiar as they would grow confident in their ability to do so.

Lastly, a language that is at the same time a representation and a manifestation of a system offers an unlimited and unbounded potential for creativity and incarnation as its components are simultaneously a concept as well as its very embodiment. Add a station to a map and it immediately starts to exist.

INAT GRAPHIC LANGUAGE

Since schematic maps are the most efficient way of representing a metro system and are an already familiar tool for many, a map-based graphic language could achieve a universal understanding across continents and cultures.

However, such a language needs to be consistent and straightforward enough to be intuitively understood without prior learning or even a legend. The INAT graphic language is an attempt to reach this goal. INAT's components are clearly defined and hierarchically organized to enable immediate comprehension while a limited number of composition guidelines ensure the layout remains coherent.

Maps composed using the INAT graphic language have a compact shape and are handy for use with a wide range of media. The language is also easy enough to interpret as it uses a consistent set of symbols and syntactic rules. Finally, it makes use of schematization and mnemonics to aid in the creation of a mental image.

It is a complete language with an unlimited potential for creation and just as with any other language, the quality of the speech depends on the eloquence and inspiration of the speaker. Thus, as much as it is suitable for drafting a user's manual, if properly articulated, it may blossom into poetry.

COMPONENTS

LINES

Represent regular transport services on a fixed route. They are the backbone of the map and are categorized according to transport mode, frequency, capacity, and reliability.

A Metro system has a high capacity, high frequency, runs on dedicated protected tracks, and is definitively reliable.

A Commuter Rail system is a suburban rail service with a high capacity and reliability, but often reduced frequency, especially on branch lines or express service patterns.

A Light Rail is similar to a Metro but with reduced capacity and frequency. It encompasses a broad range of systems from Monorails with a limited number of carriages, to trams with protected rights of way and automated people movers.

Bus Rapid Transit (BRT) is a service that operates bus vehicles on a segregated right of way with controlled-access station platforms in order to achieve high service reliability and capacity/frequency, similar to a light rail.

Trams and buses use low capacity vehicles operating in mixed traffic conditions without a guarantee of a reliable service.
squares for buses.

STATIONS

Have a shape related to the transport mode serving them: circles for rail, squares for buses.

The size of the transfer stations is relative to the number of lines serving them. When a transfer is available between 2 stations with different names, a short corridor is shown connecting them. When a transfer requires a long walk, it is shown as two separate stations connected by a longer corridor. Straightforward out-of-system transfers within a reasonable distance are portrayed as 2 stations connected by a dotted line.

STATION NAMES

Are always written horizontally, with terminal station names in bold capitals for easy spotting as they indicate travel directions.

COLORS

Are used to identify lines and different shades provide informational depth to the map. Bright colors are used for the main metro system while lighter pastel colors are used mainly for commuter rail lines and special services.

ICONS

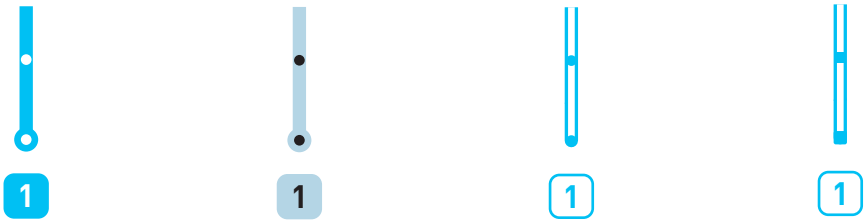
Indicate the location of major transport hubs for regional or international travel.

LANDSCAPE FEATURES

Help with orientation and are limited to the most relevant ones, such as rivers or large parks.

LINE TYPE

Metro | Commuter Rail | Light Rail | Bus Rapid Transit (BRT)



TRANSFER STATION

Regular transfer | Transfer between stations with different names | Long walk transfer

STATION NAME

Regular Station | Terminal Station

Châtelet

CHÂTELET

COLORS

ICONS

Airport | Railway Station | Bus Terminal | Maritime Terminal

Tramway	Bus	Ferry	Cable Car
11			

Out of system transfer

	LANDSCAPE
	Park Water

COMPOSITION

Line directions are constrained to angles which are multiples of 45°: horizontal, vertical and diagonal. The reduced scope of configurations allows for accurate identification and eliminates ambiguities which could otherwise arise.

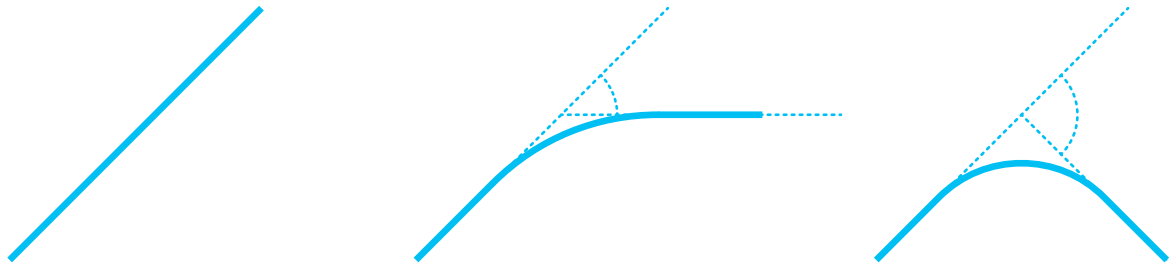
Lines that share a common route are shown as parallel with an even spacing while lines that intersect one another are separated by a white stroke.

A thorough process of shape schematization is a prerequisite for a successful map. Line shapes are simplified as much as possible, reducing the number of bends while the overall topology is maintained. The objective is to obtain a shape which is easy to identify and remember. The simpler the shapes, the easier it is to build a mental image of the network. The number of bends should ideally be kept below 6.

Design harmony is achieved through order, rhythm and symmetry. Parallel lines are evenly spaced and similar forms relate to each other. The objective is to make the best use of the available space and to explain how the network works by providing a meaning to its overall shape.

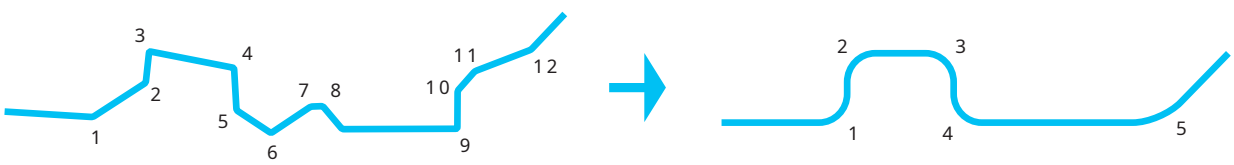
Whenever possible, striking symbolic shapes are used for the most characteristic parts of the network. These familiar shapes constitute powerful mnemonics for every user.

ANGLES

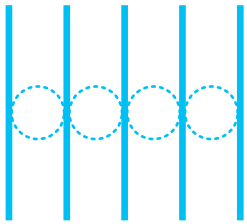


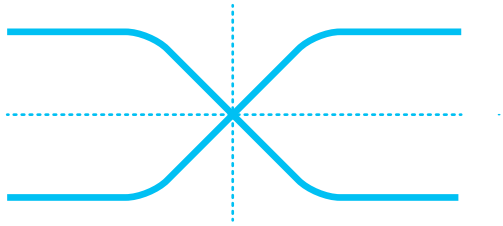
INTERACTION

SHEMATIZATION

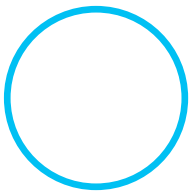


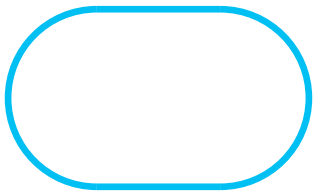
RHYTHM AND SYMMETRY





SYMBOLIC SHAPES





ORTHOGONAL

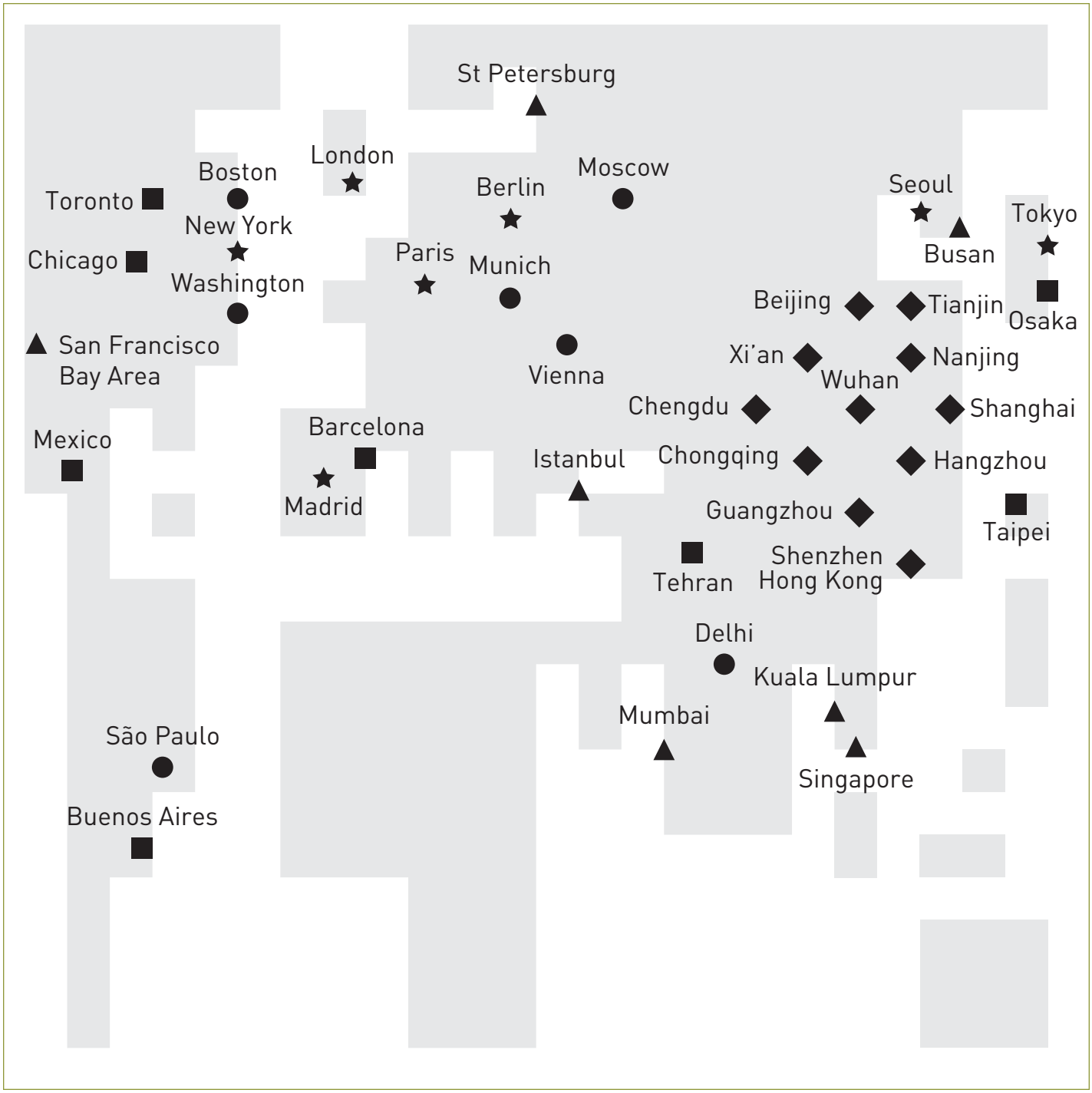
RADIAL

LANDSCAPE

CHINA

COMPOSITE

METRO MAPS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Munich
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Osaka
San Francisco
Bay Area
Xi'an
Nanjing
Vienna
Wuhan
Chengdu
Shanghai
Barcelona
Mexico
Istanbul
Chongqing
Hangzhou
Madrid
Guangzhou
Taipei
Shenzhen
Tehran
Hong Kong
Delhi
Kuala Lumpur
Mumbai
São Paulo
Singapore
Buenos Aires

A metro map is a graphic novel or, better said, a brand new graphic novel every time you look at it or think about it.

It provides a framework for unlimited stories with multiple beginnings and unlimited ends. It is a canvas for travel scenarios and an open field where reality and imagination intermingle.

The everyday experience of the metro network is enhanced by the knowledge of the network offered by the map which holds records of past journeys and reveals potential new ones.

Each metro system has a unique layout and flavor and so each map is a unique work of art summing up its characteristics in an iconic representation.

Notwithstanding their singularities, some metro networks present structural similarities and familiar settings. For the purpose of this book, maps are grouped into five broad network families: Orthogonal, Radial, Landscape, China, Composite.











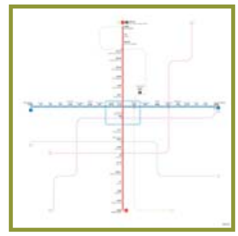


















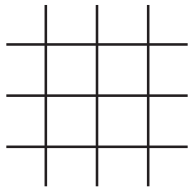








Toronto
Chicago
Osaka
Mexico
Barcelona
Taipei
Tehran
Buenos Aires



ORTHOGONAL

In orthogonal networks, lines are constrained to a regular grid of evenly spaced parallel and perpendicular axes. Routes bend mostly at right angles and diagonals are the exception.

The origins of such layouts are diverse. In Chicago, Toronto and Barcelona, the structure comes from the inheritance of a historic orthogonal street pattern, and in Buenos Aires of several such patterns.

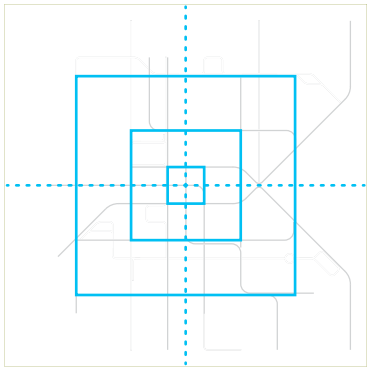
In Mexico, orthogonality arises from scaling up the historical regular city layout. In Tehran it is the result of historic axes organizing the urban fabric. In Taipei and Osaka, the grid is limited to a regularly shaped downtown area.

MEXICO

SQUARES SCALED UP

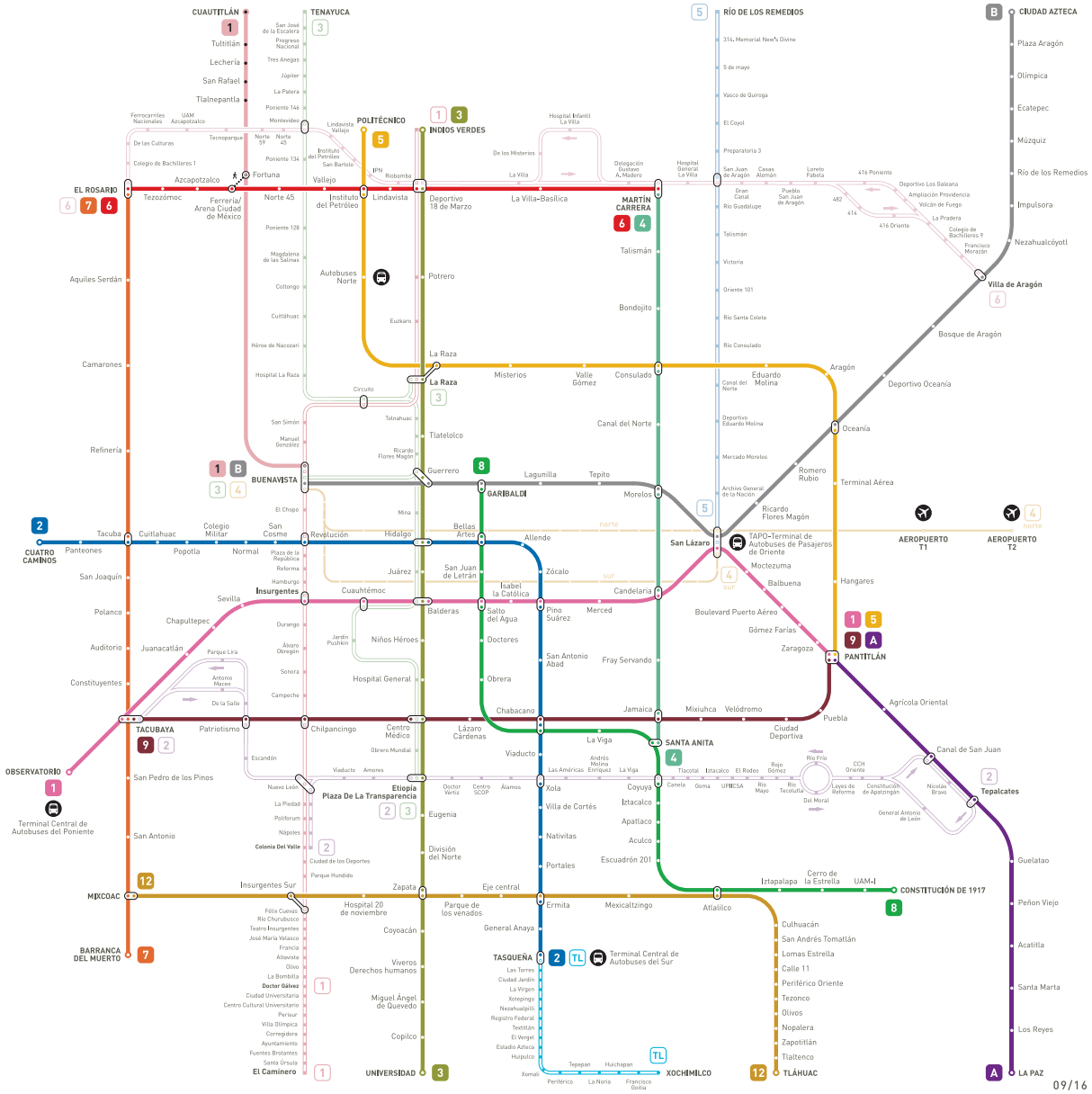
The central square is the original city. Tenochtitlan, the Aztec capital, was built on an island in the shallow waters of Lake Texcoco. It was laid out following a regular orthogonal plan. Two wide avenues followed the north-south and east-west axes and all streets and canals ran parallel to them. Palaces and temples stood at the intersection marking the symbolic center of the city and state.

Spanish invaders conquered and destroyed the city, then built a new settlement at the exact same location and following a similar orthogonal layout. A large square, the Zócalo, and a cathedral replaced the temples and the name of the city became Mexico, the toponym of the entire valley. As the new city expanded, Lake Texcoco was gradually drained to make room for new neighborhoods and the street grid pattern was eventually discontinued, though the main arteries still conform to the original axes. Likewise, the metro network reproduces the original orthogonal street grid inside the historic center before following the main arterials outside of it. Just as the city expanded outwards from the original settlement, eventually covering the entire valley, the metro grid scaled up from the original central square into successively larger squares.



STRUCTURE

METRO NETWORK



MEXICO

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CHICAGO

AT THE BEGINNING IS THE LOOP

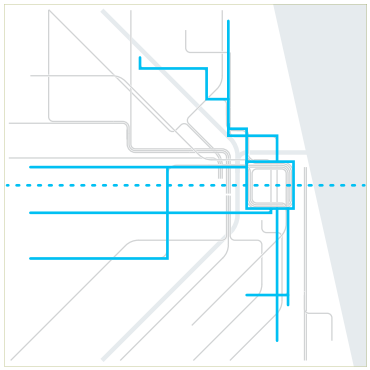
Downtown Chicago, a dense cluster of high-rise buildings, lies on the shores of Lake Michigan. It is surrounded by an extensive low-rise urban area.

Elevated metro tracks circle around the Downtown in a loop following the strict orthogonal pattern of the streets. The metro network's name—the "L"—is short for "elevated".

Lines from three different directions enter the loop and run either clockwise or counterclockwise inside of it. Two more lines cross the loop on a north-south axis; together they form the Downtown grid.

Outside the loop, lines conform to an overall orthogonal street pattern, running north, east and south with only a couple diagonals.

By contrast, the commuter rail network radiates out from four Downtown terminals outside the loop with complete disregard for the street layout.



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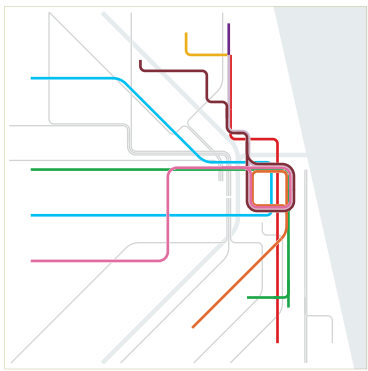
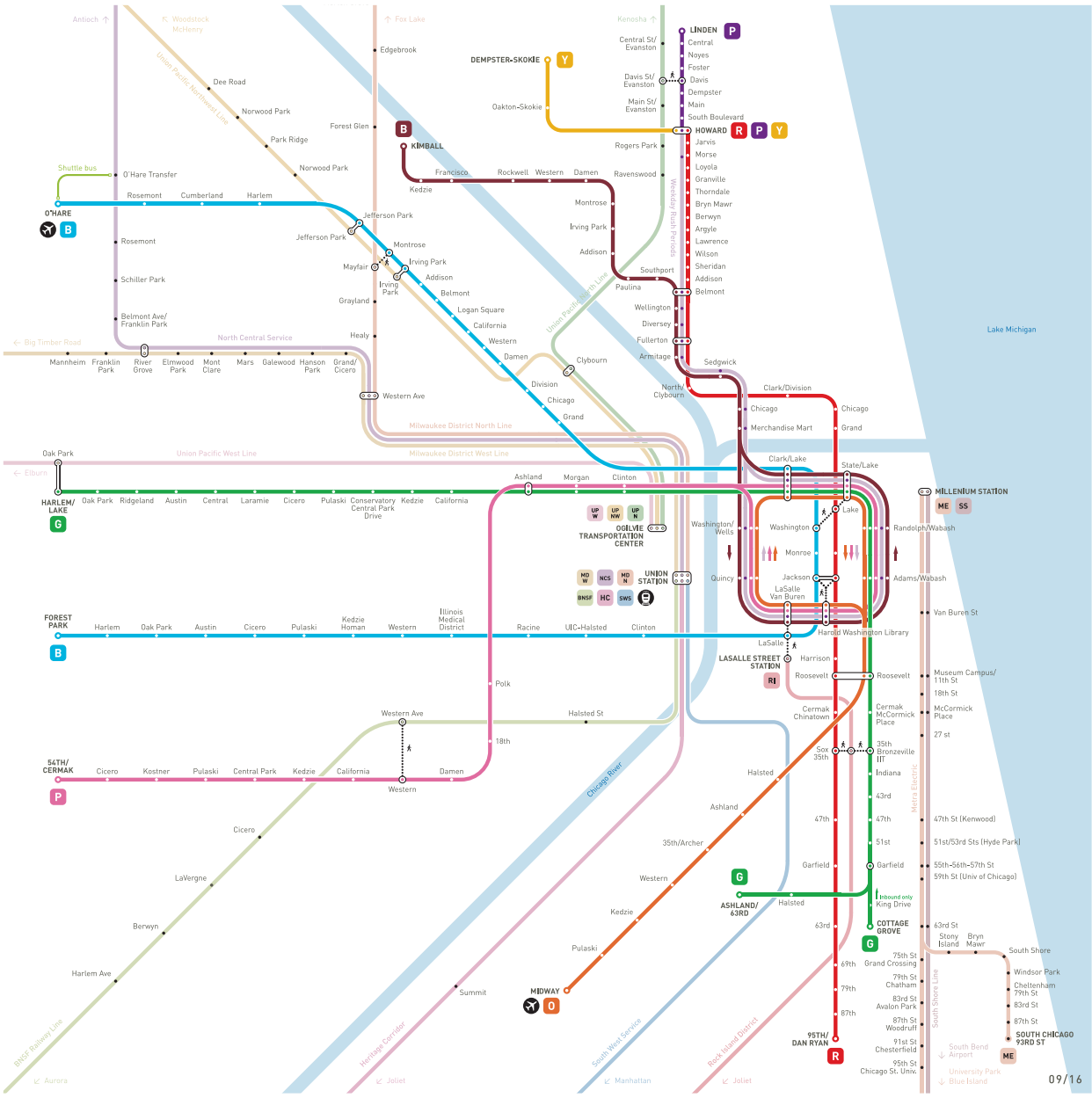


ELEVATED NETWORK



CHICAGO

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TEHRAN

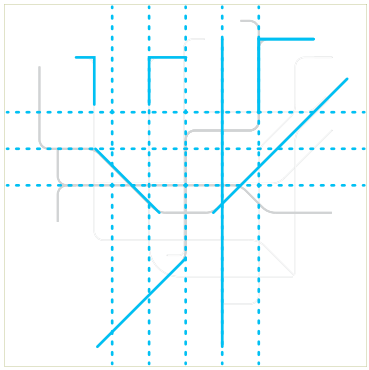
THE CHESSBOARD

As the mighty Alborz mountain range rises from the Iranian plateau, so does Tehran on its slopes. The mountain chain runs east-west and the city ascends it from south to north.

The Silk Road once followed the southern edge of these mountains from China and Samarkand onwards to Tabriz and the Mediterranean. This heritage is embedded in Tehran's urban structure.

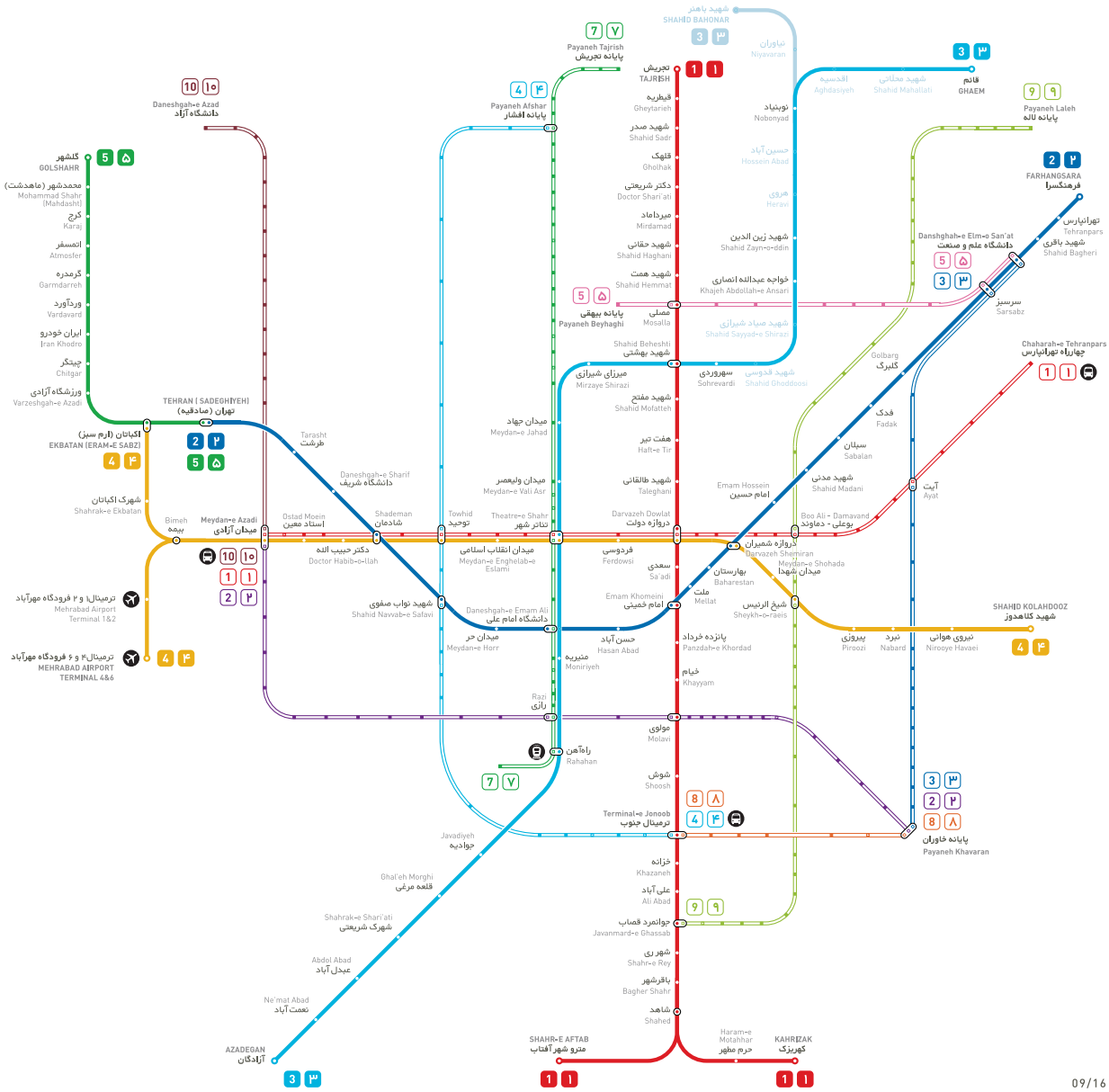
Tehran's main arterials run parallel to the mountain, just as the ancient Silk Road used to, or perpendicular to it, thus ascending its slopes.

The public transport network is a combination of two intermingled webs—the metro and bus rapid transit systems—laid over the orthogonal arterials.
The combined network layout looks like the trajectory of a chess game where each transport system is one player and the grid of roads is an urban chessboard.
The shapes of lines reproduce the movement of pieces on the board: horizontal, vertical, diagonal, or L-shaped.



STRUCTURE

METRO NETWORK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دانشگاه آزاد
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پایانه تجریش
Payaneh Afshar
پایانه افشار
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میدان ولیعصر
Meydan-e Vali Asr
شهید طالقانی
Taleghani
دروازه دولت
Darvazeh Dowlat
فردوسی
Ferdowsi
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Sa'adi
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Meltat
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Moniriyeh
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Rahahan
شوش
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Ghal'eh Morghi
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Garmdarreh
وردآورد
Vardavard
ایران خودرو
Iran Khodro
چیتگر
Chitgar
ورزشگاه آزادی
Varzeshgah-e Azadi
TEHRAN (SADEGHIYEH)
تهران (صادقیه)
اکباتان (ارم سبز)
EKBATAN (ERAM-E SABZ)
شهرک اکباتان
Shahrak-e Ekbatan
ترمینال۱ و ۲ فرودگاه مهرآباد
Mehrabad Airport Terminal 1&2
ترمینال۴ و ۶ فرودگاه مهرآباد
MEHRABAD AIRPORT TERMINAL 4&6
Bimeh
بیمه
Meydan-e Azadi
میدان آزادی
Tarasht
طرشت
Daneshgah-e Sharif
دانشگاه شریف
Ostad Moein
استاد معین
دکتر حبیب الله
Doctor Habib-o-llah
Shademan
شادمان
شهید نواب صفوی
Shahid Navab-e Safavi
Towhid
توحید
Theatre-e Shahr
تئاتر شهر
میدان انقلاب اسلامی
Meydan-e Enghelab-e Eslami
Daneshgah-e Emam Ali
دانشگاه امام علی
میدان حر
Meydan-e Horr
Payaneh Laleh
پایانه لاله
نوبنیاد
Nobonyad
حسین آباد
Hossein Abad
هروی
Herav
شهید زین الدین
Shahid Zayn-o-ddin
خواجه عبدالله انصاری
Khajeh Abdollah-e Ansari
شهید صیاد شیرازی
Shahid Sayyad-e Shirazi
سهروردی
Sohrevardi
شهید قدوسی
Shahid Ghaddoosi
Emam Hossein
امام حسین
دروازه شمیران
Darvazeh Shemiran
بهارستان
Baharestan
شیخ الرئیس
Sheykh-o-raeis
پانزده خرداد
Panzdah-e Khordad
خیام
Khayyam
Meydan-e Shohada
میدان شهدا
Boo Ali - Damavand
بوعلی - دماوند
شهید مدنی
Shahid Madani
Golberg
گلبرگ
فدک
Fadak
سیلان
Sabalan
آیت
Ayat
پیروزی
Pirouzi
نبرد
Nabard
نیروی هوایی
Niroeye Havaei
SHAHID KOLAHDOOZ
شهید کلاهدوز
قائم
GHAEM
اقدسیه
Aghdasiyeh
شهید محلاتی
Shahid Mahallati
FARHANGSARA
فرهنگسرا
Danshghah-e Elm-o San'at
دانشگاه علم و صنعت
تهرانپارس
Tehranpars
شهید باقری
Shahid Bagheri
سرسبز
Sarsabz
Chaharah-e Tehranpars
چهارراه تهرانپارس
پایانه خاوران
Payaneh Khavaran
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TEHRAN
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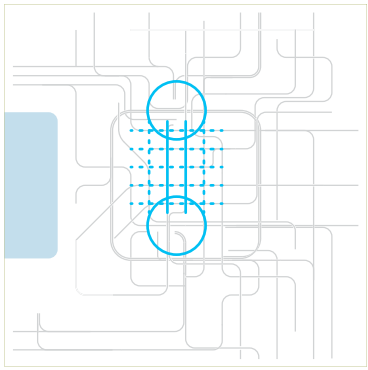
OSAKA

BETWEEN THE GATES

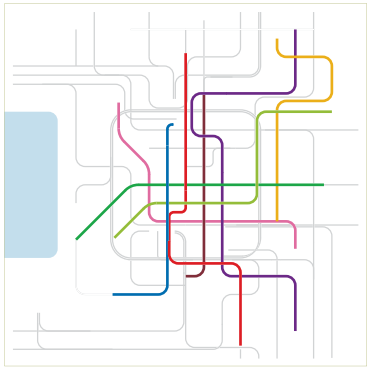
To the west is the bay, to the east are the mountains. From north and south, rail lines converge in two main terminals: Umeda and Namba, the gates of Osaka.

Between the gates, a dense grid of metro lines permeates the city center and connects it to the gates.

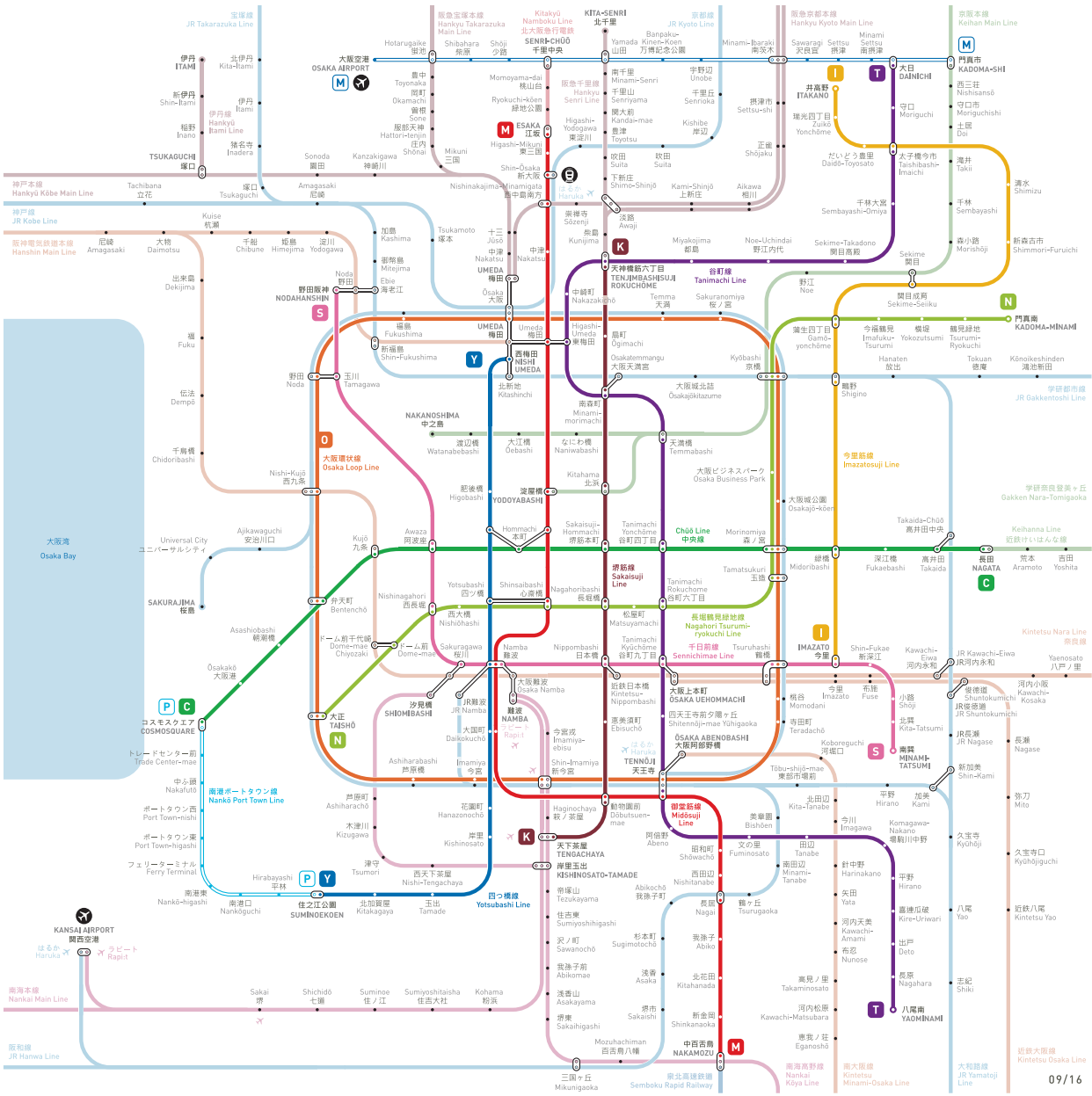
Further highlighting the central area, a loop line surrounds the grid on all four sides.



STRUCTURE



METRO NETWORK



OSAKA

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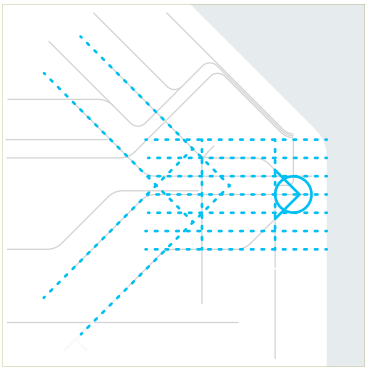
BUENOS AIRES

TILTING AXES

Buenos Aires on the Rio de la Plata: Fair Winds on the River of Silver.
What a poetic setting for the colonial Spanish harbor that is today the capital of Argentina.

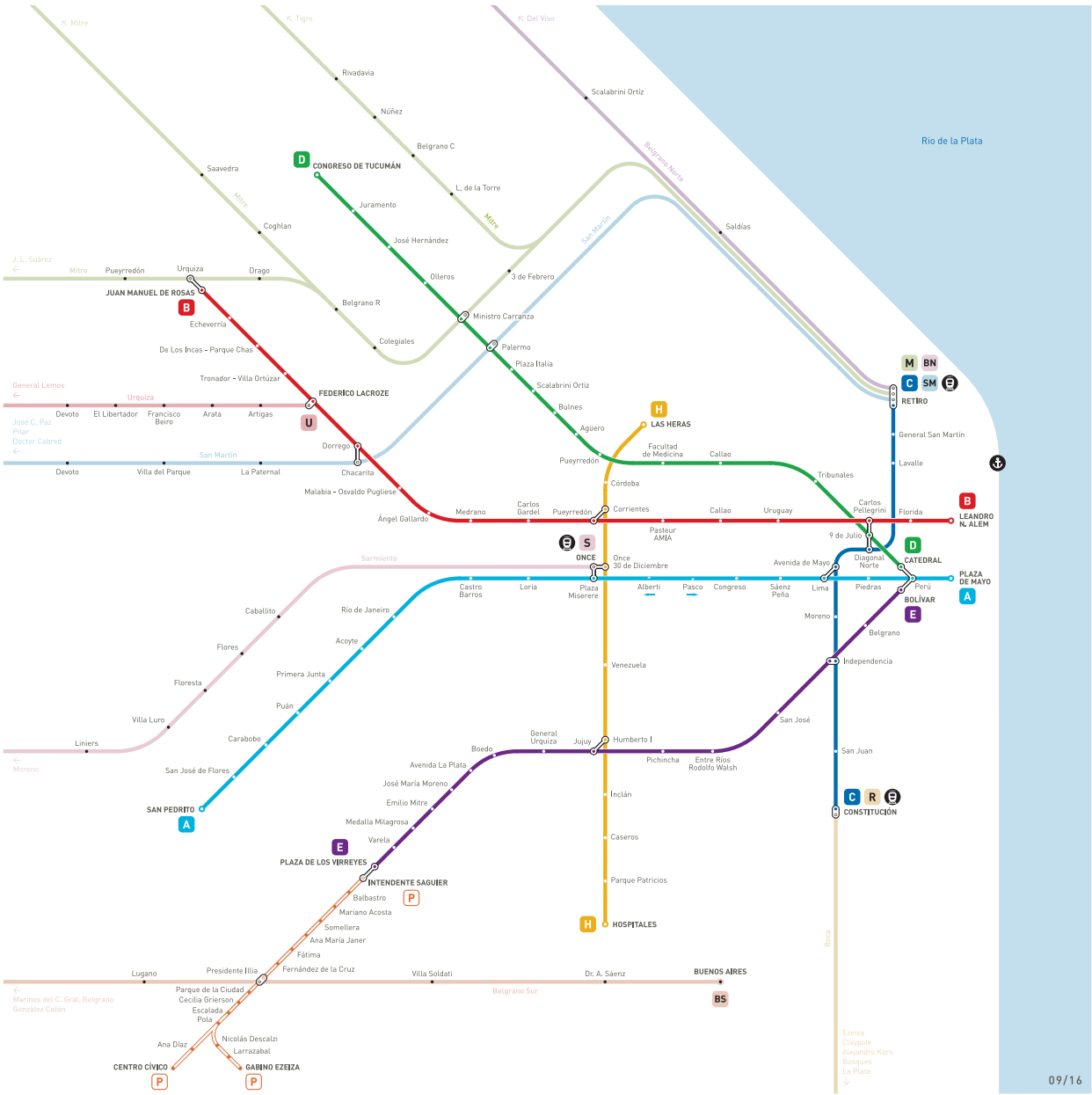
The original settlement was laid out on the banks of the estuary with an orthogonal street grid like many others in the New World. As the city expanded, so did the grid, but as the distance from the center increased the grid axes started tilting and each new neighborhood was built with a slightly different orientation.
The original matrix was maintained throughout the city, a principle so intuitive that in Buenos Aires, distance and time are counted in “cuadras” or blocks. However, the orientation escaped the original rationality and embraced a poetic license.

The Subte, short for subterráneo or underground, originates inside the historic core from which lines expand to the west in three successive stages. First, lines radiate from Plaza de Mayo, then they strictly follow the primordial grid. Lastly, they tilt to the local axes of the outer neighborhoods’ particular grids.



STRUCTURE

SUBTE NETWORK



BUENOS AIRES

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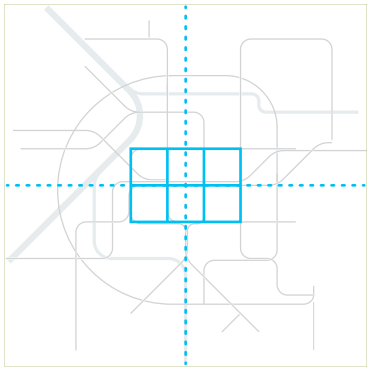
TAIPEI

SIX SQUARES

In the final stage of the Chinese Civil War, the defeated nationalist army retreated from the mainland to the island of Taiwan and established a provisional capital in Taipei. The sudden population influx, both of military personnel and accompanying civilians, turned the backwater prefecture into a bustling metropolis.

The lack of accommodation sparked an extensive building program that reshaped the city. Major arterials were laid out in an orthogonal fashion creating vast city blocks filled with buildings and secondary streets.

This urban layout is reflected in the metro network whose lines become entangled in the city center to form six large squares. After exiting the squares, they disentangle into individual routes reaching out into the periphery.



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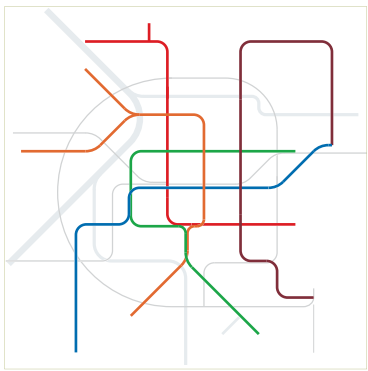
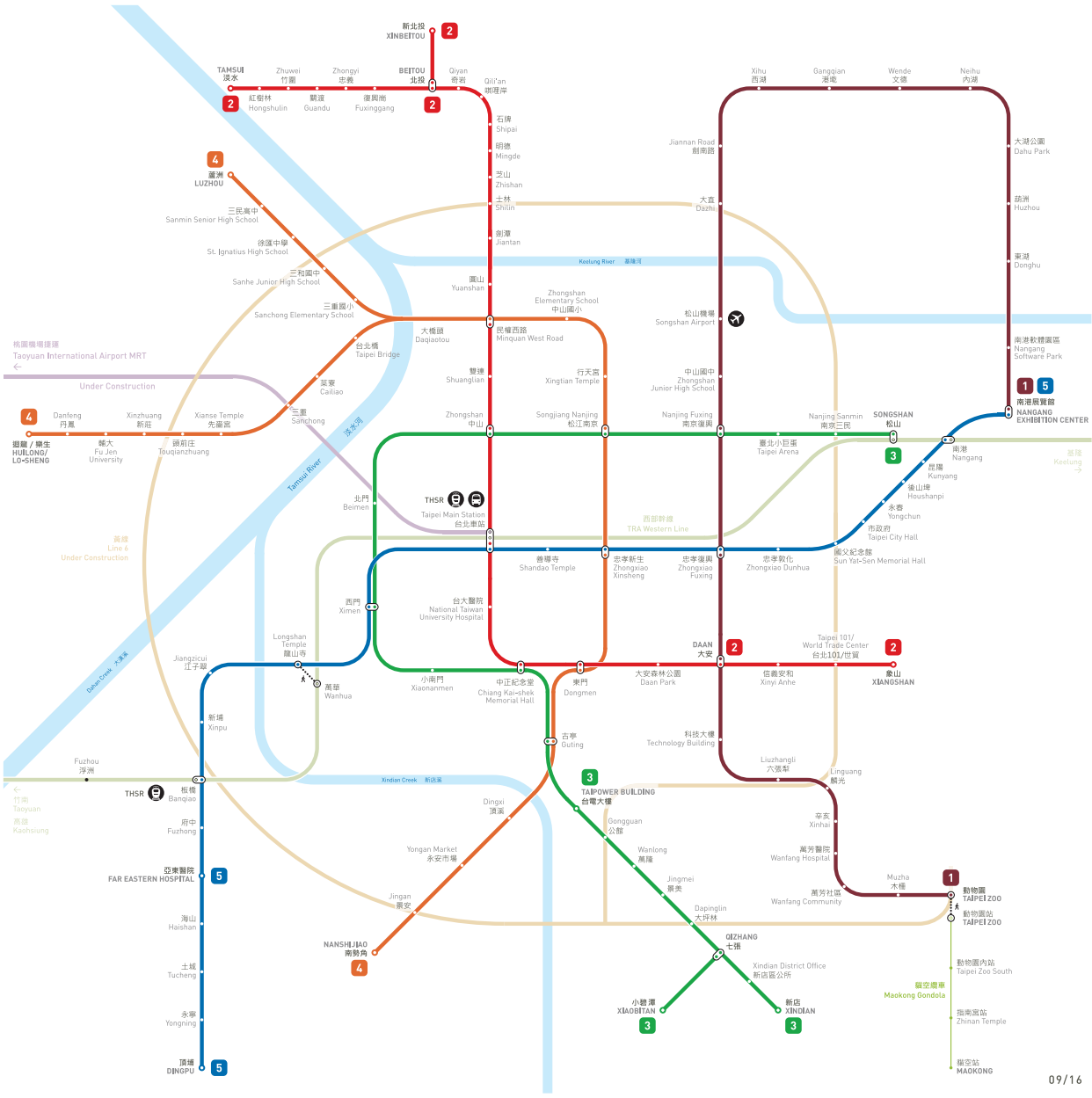


METRO NETWORK



TAIPEI

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TORONTO

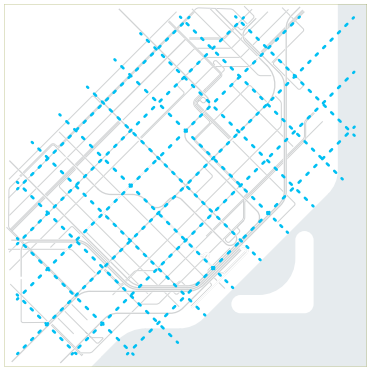
STRAIGHT FROM THE LAKE

From the shores of Lake Ontario, a regular orthogonal street pattern extends towards the hinterland across the plain. All streets are perpendicular or parallel to the shore with very few exceptions.

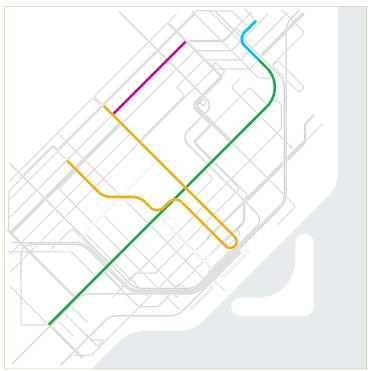
The combined transport network conforms to the same logic. The metro, streetcar, and bus lines usually run straight across the grid, seldom changing direction.

Metro lines form the backbone of the network and the two main lines intersect at Bloor-Yonge station, the geographic center of the city.

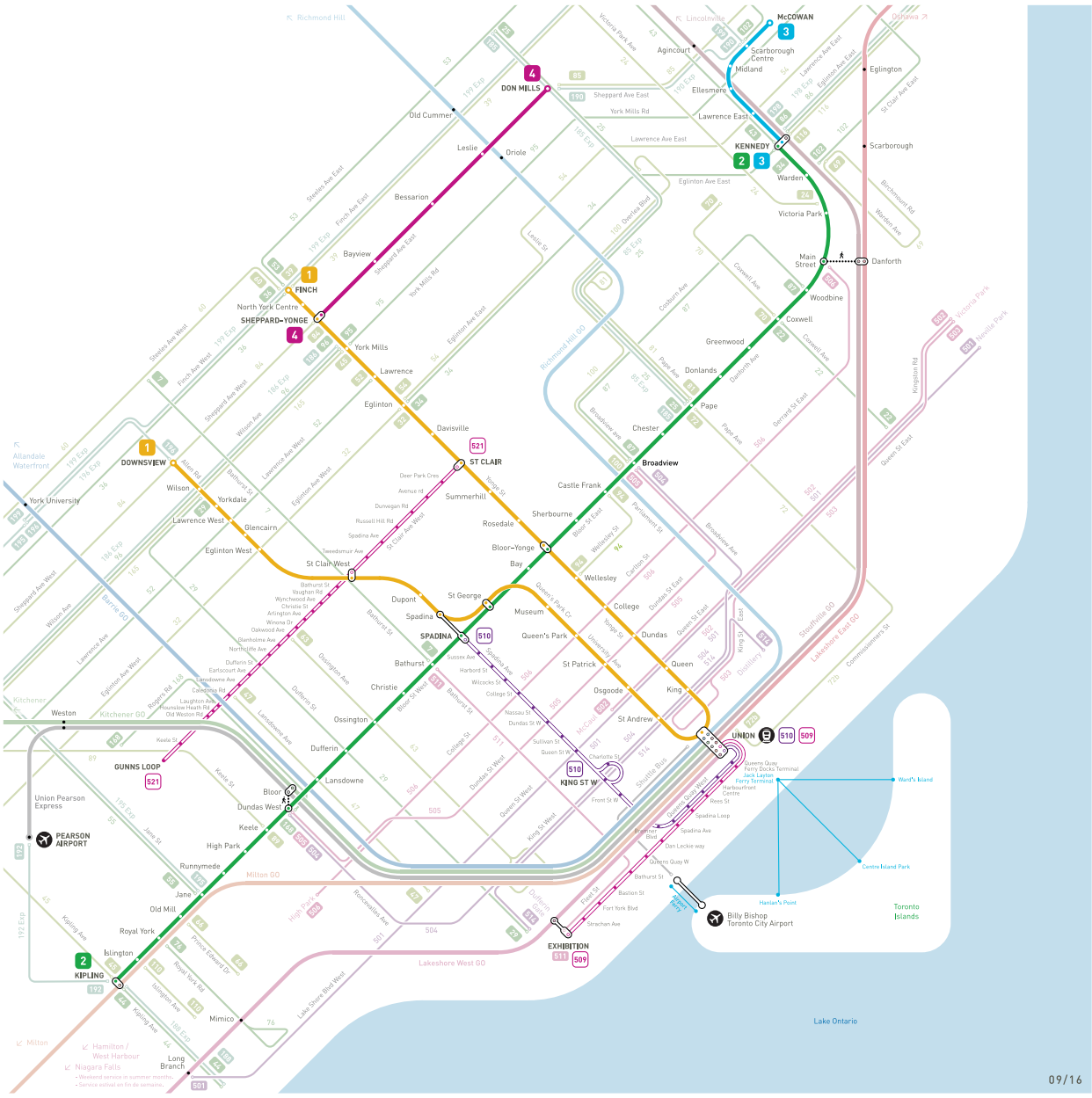
The Downtown area is located between this intersection and the Union Station rail terminal served by all commuter rail lines. It is crisscrossed by streetcar lines while outside of it, the frequent bus network mirrors the city-wide street layout.



STRUCTURE



SUBWAY NETWORK



TORONTO

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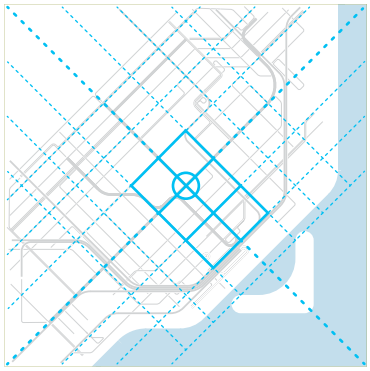
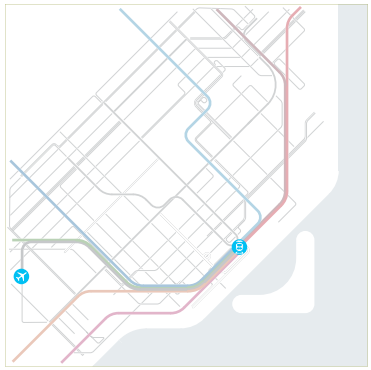
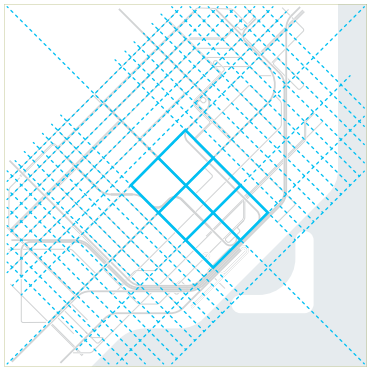


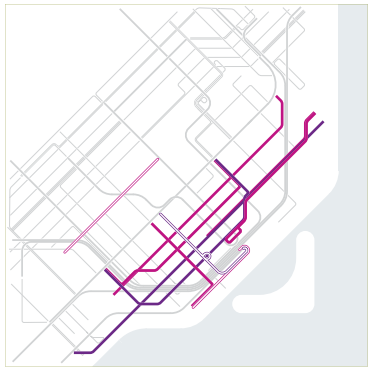
CITYSCAPE



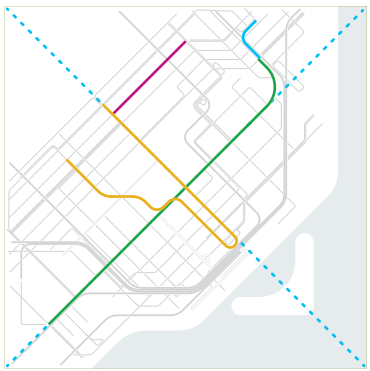
COMMUTER RAIL



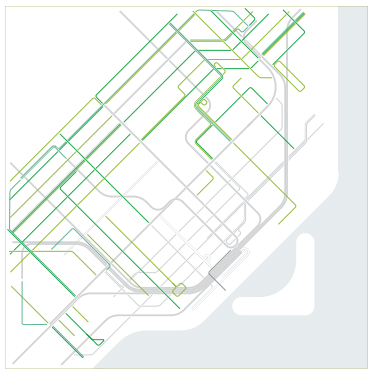
DOWNTOWN



STREETCAR



METRO



FREQUENT BUS

CITYSCAPE

Streets are perpendicular or parallel to the lake shore and evenly spaced.

The map is tilted to the 45° axis to create a compact layout with the main diagonals intersecting at the city's perceived geographic center.

DOWNTOWN

Downtown is shown to scale with preserved proportions. Squares remain squares.

When the periphery of the regular orthogonal grid is condensed, the area adjacent to Downtown faces significant deformations as only one dimension of the square can be modified. Squares adjacent to Downtown thus become rectangles. Squares in corners remain squares.

Proportions outside of Downtown are not respected, yet the map remains topologically accurate at all times.

METRO

Line 1 (yellow) runs twice straight through Downtown on two parallel routes, changing direction of travel at Union Station.
Line 2 (green) runs cross-town parallel to the lake and intersects line 1 at Bloor-Yonge station.
Line 3 (light blue) is a continuation of line 2 towards Scarborough.
Line 4 (magenta) complements line 1 in the north.

COMMUTER RAIL

All lines start from Union Station. They use a common corridor along the lakeshore, then continue to follow the lake or branch out towards the hinterland.

Union Pearson Express line (grey) is a dedicated airport rail link serving Pearson Airport.

STREETCAR

Streetcar lines crisscross Downtown. Lines run on straight routes, either parallel or perpendicular to the shore.

Lines 509, 510 and 521 have dedicated rights of way and are shown as a light rail.

FREQUENT BUS

Bus lines cover the areas outside Downtown not served by any other transit mode. The frequent bus network is a feeder for metro lines as well as a cross-town connection service.

B A R C E L O N A

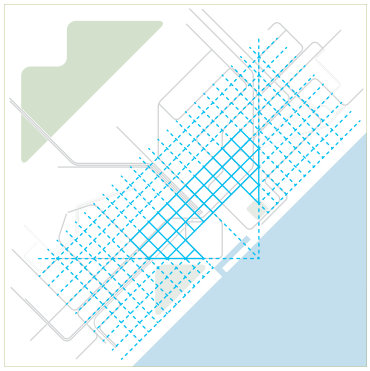
M A R Y M U N T A N Y A

Barcelona extends over a gently sloped coastal plain between the Mediterranean Sea and the Collserola mountains.

The port city was constrained inside its medieval walls until the brilliant Cerdà plan paved the way for its territorial expansion. The plan called for a regular grid of wide streets intersecting at right angles with the building blocks' edges chamfered at 45° to create wide open spaces at each intersection. The Eixample or extension was implemented in all possible directions until it reached physical obstacles such as already built areas, mountains, or the sea. Three avenues are exceptions to the strict orthogonal rule: "Parallel" and "Meridiana", respectively parallel and perpendicular to the equator, cut the grid at 45° degrees while "Diagonal" cuts it with a 2/1 slope.

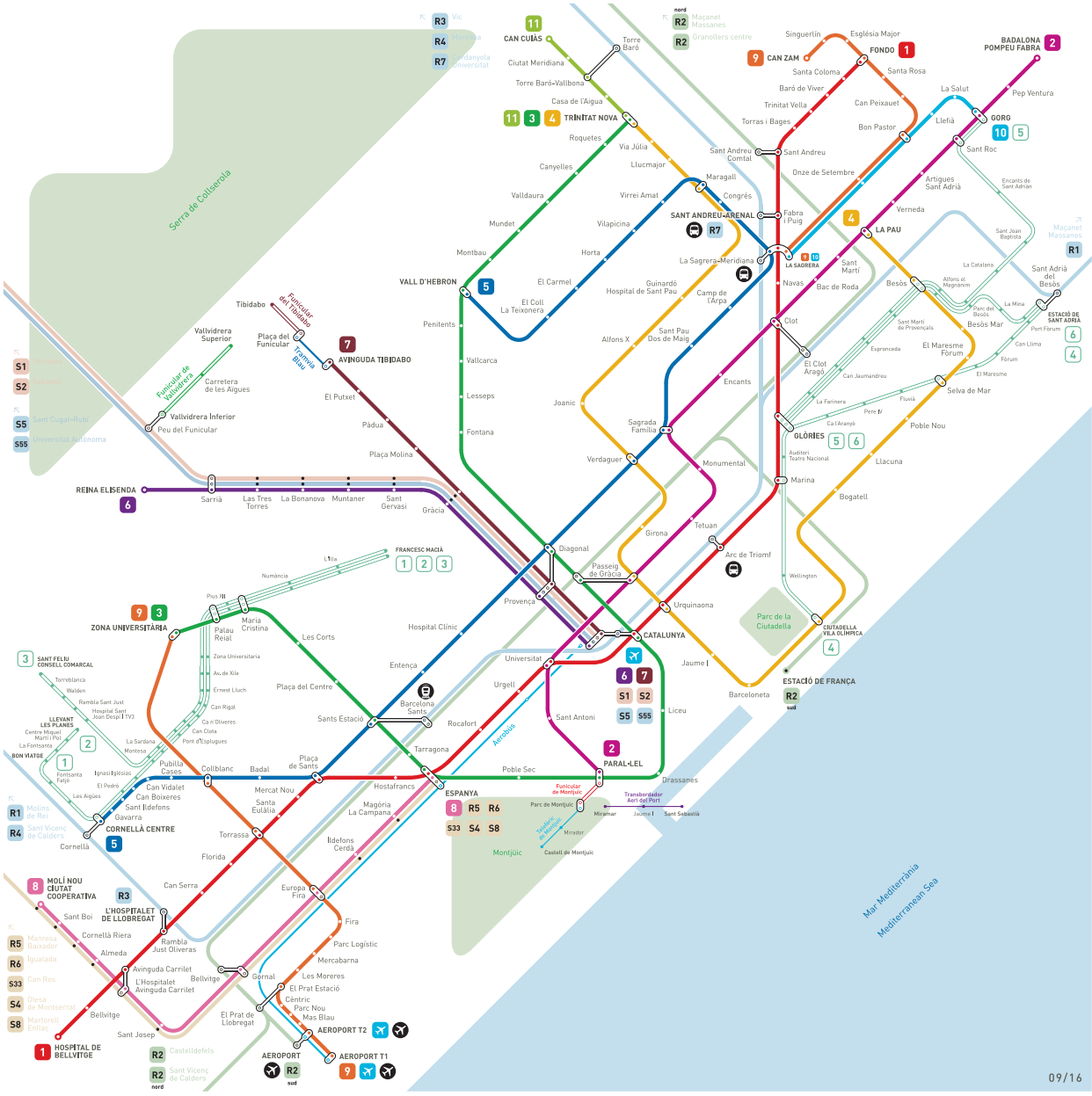
The metro network faithfully mirrors the urban layout. Lines follow the Rambla and Layetana arterials through the historic center and conform to the grid and Parallel/Meridiana Avenues outside of it.

Commuter rail and tramway networks complement the metro system. The tramway runs on Diagonal Avenue with two separated routes. Just as Diagonal is an exception in Barcelona, the angle of the tramway route on the map is the unique exception to the usual composition rules.



STRUCTURE

METRO NETWORK


BARCELONA
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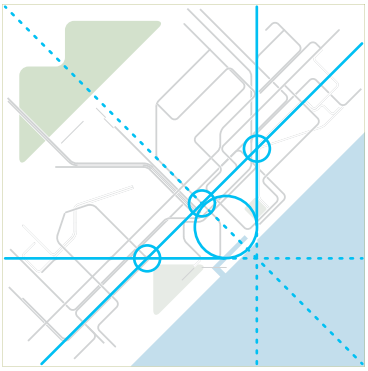
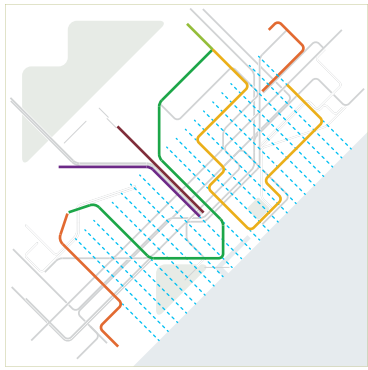
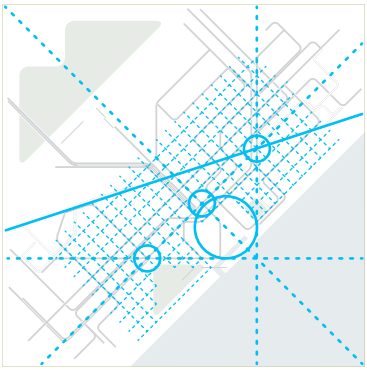
CAN CUIÀS
TRINITAT NOVA
VALL D'HEBRON
AVINGUDA TIBIDABO
REINA ELISENDA
ZONA UNIVERSITÀRIA
FRANCESC MACIÀ
SANT ANDREU-ARENAL
CAN ZAM
FONDO
BADALONA POMPEU FABRA
LA PAU
GORG
LA SAGRERA
GLÒRIES
CATALUNYA
ESPANYA
PARAL·LEL
ESTACIÓ DE FRANÇA
CIUTADELLA VILA OLÍMPICA
ESTACIÓ DE SANT ADRIÀ
CORNELLÀ CENTRE
HOSPITAL DE BELLVITGE
L'HOSPITALET DE LLOBREGAT
MOLÍ NOU CIUTAT COOPERATIVA
AEROPORT T1
AEROPORT T2
Serra de Collserola
Montjuïc
Parc de la Ciutadella
Mar Mediterrània
Mediterranean Sea



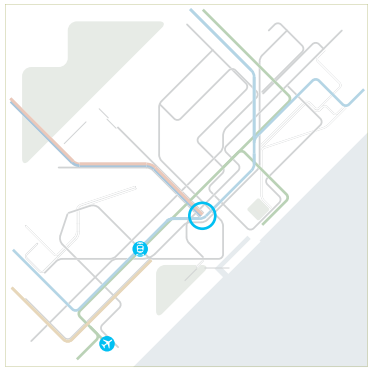
CITYSCAPE



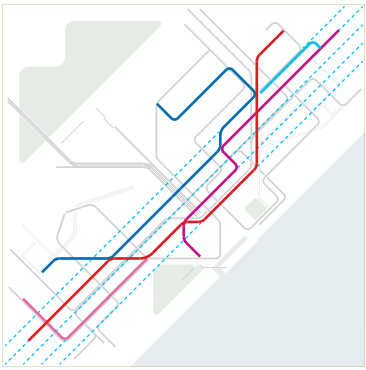
SEA TO MOUNTAINS



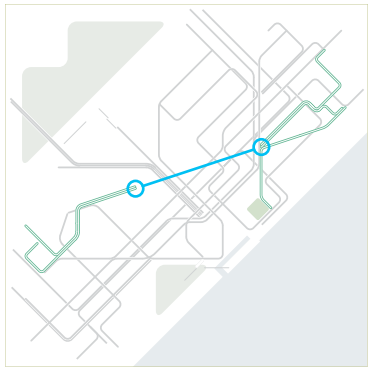
GRID



COMMUTER RAIL



PARALLEL TO SHORE



TRAMWAY

CITYSCAPE

The sea and the mountains frame the urban area.

Three arterial axes frame the historic center: horizontal Parallel, vertical Meridiana and diagonal Gran Via.

Three major squares stand at their intersections and in the center, from west to east: Espanya, Catalunya and Glòries.

GRID

The Eixample regular street grid extends from the historic center towards the mountains and along the shore.

Diagonal Avenue cuts through its heart from the sea onwards, passing through Glòries Square.

PARALLEL TO SHORE

5 lines run mostly parallel to the seashore. Line 1 (red) follows both Meridiana and Parallel avenues and connects the three previously mentioned main squares.

SEA TO MOUNTAINS

5 lines run mostly from the sea towards the mountains.

Line 3 (green) and line 4 (yellow) serve the historic center.

Line 6 (purple) and line 7 (brown) share the Catalunya terminal with FGC commuter rail lines.

The eastern and western parts of line 9 (orange) are to be connected in the future.

COMMUTER RAIL

Barcelona has two commuter rail networks.

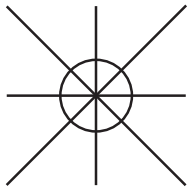
Ferrocarrils de la Generalitat de Catalunya-FGC uses the Catalunya and Espanya terminals.

Rodalies Renfe cross-town lines serve the Sants railway station, the airport and either Catalunya (pastel blue line) or Passeig de Gràcia (pastel green line) central stations.

TRAMWAY

Two separate tramway networks operate in the east and the west of the city. They both use a portion of Diagonal Avenue, leaving a gap between Francesc Macià and Glòries squares.


Boston
Moscow
Munich
Washington
Vienna
Delhi
São Paulo



RADIAL

When enough room is available, cities tend to grow organically from a small historic center by expanding in all directions along existing roads that radiate towards the countryside. These roads become structural arterials, funneling traffic into the old urban core that remains the focal point of the wider metropolis.

In such a setting, the metro network layout often focuses on the center. Lines intersect each other inside the inner urban core and radiate towards the periphery, just as the old roads did. As the network grows and more lines are added in the same manner, the center of the network becomes dense with transfer stations, whereas the outer areas remain isolated from one another.

In this case, an orbital line is sometimes created in order to alleviate ridership pressure on the inner area by connecting radiating branches with each other outside of it.

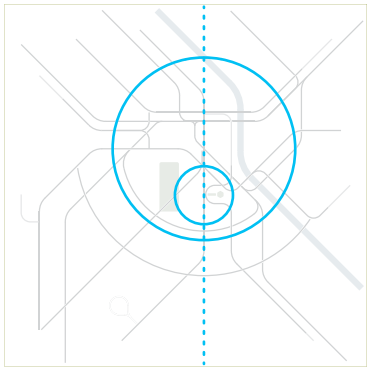
DELHI

NEW INSIDE OLD

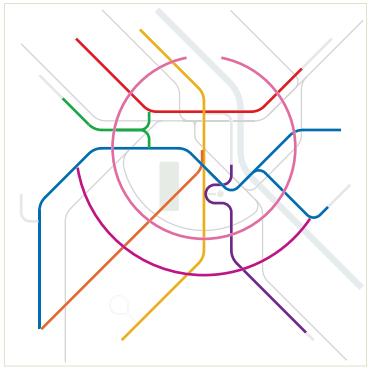
New Delhi was built as an entirely new city to serve as the new capital of India. It was founded just south of the ancient walled city of Delhi. As Delhi grew into a vast metropolis, it surrounded New Delhi and the New ended up becoming an enclave inside the Old.

The metro system is organized around this duality with two main centers from which lines radiate, one north at Kashmere Gate and the other south in New Delhi. This duality is further illustrated by line 5 (green) which has two branches in order to reach both the northern and southern systems.

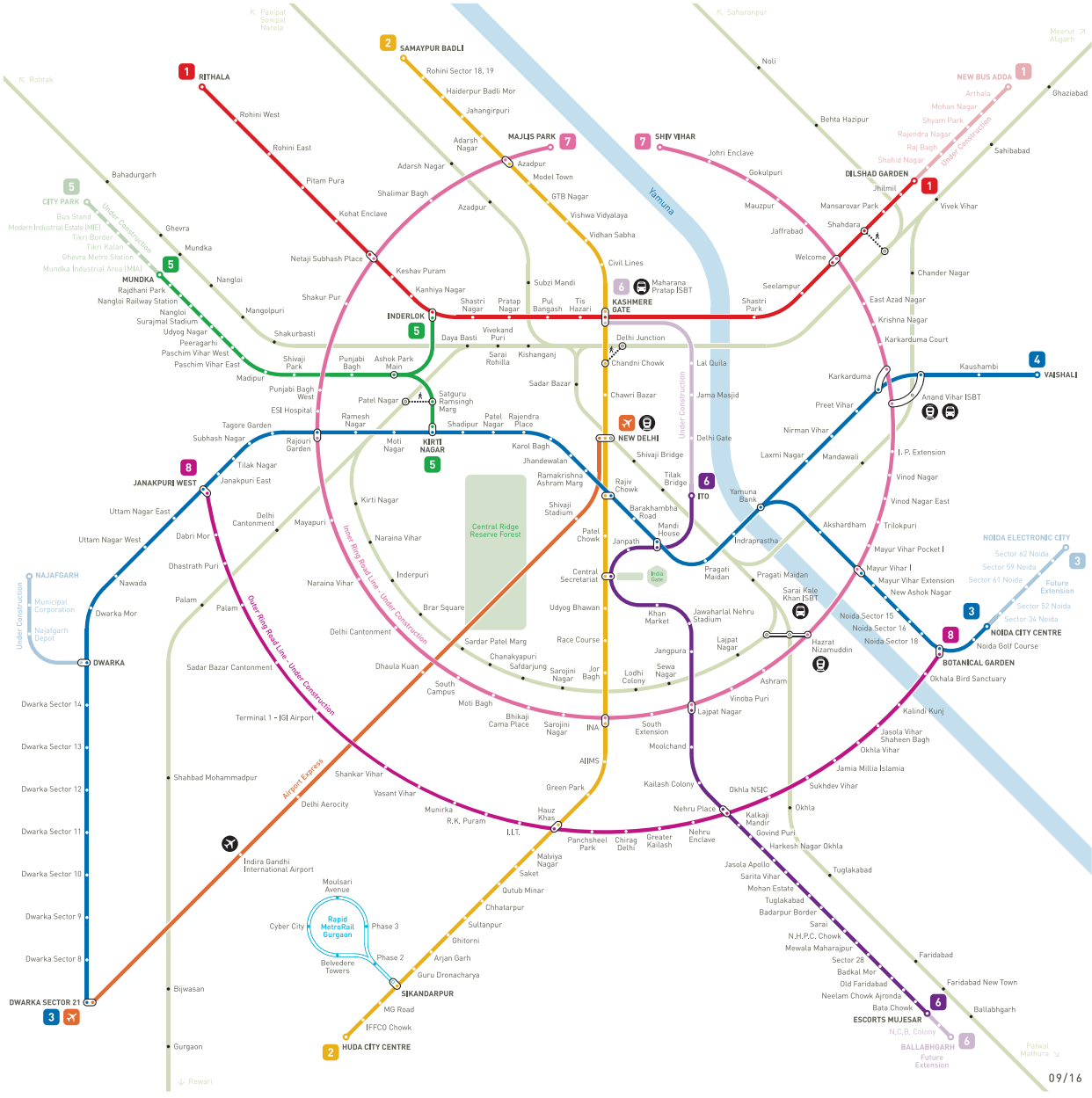
Between the two stands the main railway station, joining the old and new cities. The Old, the New, and their common railway station are connected by the north-south line 2 (yellow). Further integration is under way with line 6 (purple) set to provide a second connection between New Delhi and the historic center and a ring line under construction (pink) which will connect all existing lines and mark the center of the metropolis.



STRUCTURE



METRO NETWORK



DELHI

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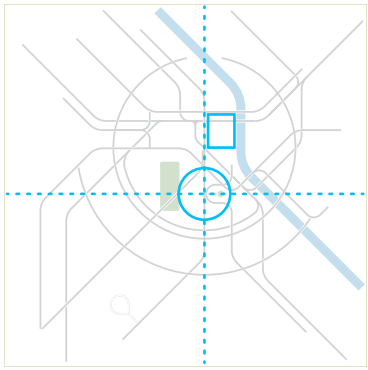
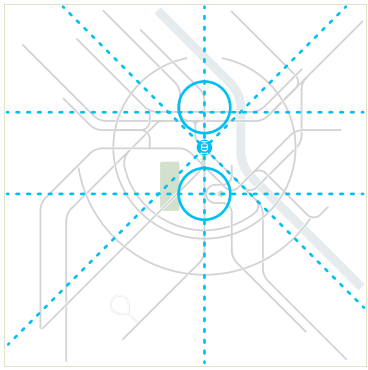
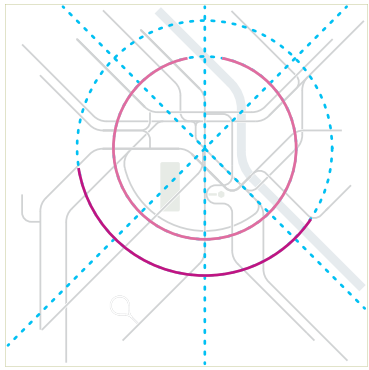


CITYSCAPE

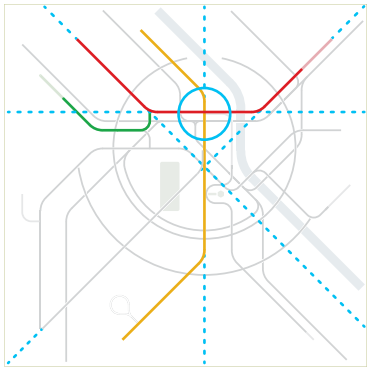
NEW CENTER



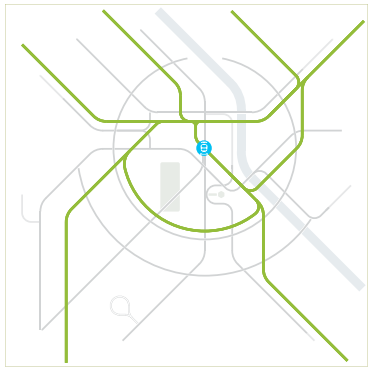
DUAL CENTRALITY



ORBITALS



OLD CENTER



COMMUTER RAIL

CITYSCAPE

Old Delhi is an ancient city on the western bank of the Yamuna River (rectangle).

New Delhi was built to its south on an east-west axis from India Gate (green hexagon) to the Central Ridge.

DUAL CENTRALITY

To the north is Kashmere Gate, the northern gate of the ancient walled city.

In the center is the main railway station.
To the south is New Delhi.

OLD CENTER

Line 1 (red) runs east-west through the city and intersects line 2 (yellow) at Kashmere Gate.

Line 5 (green) connects to line 1 with its northern branch.

NEW CENTER

Line 3 (blue) runs east-west and line 5 (green) connects to it with its southern branch.

Line 6 (purple) serves New Delhi with a semi-circular route and forms a triangle of transfer stations with lines 2 and 3.

ORBITALS

Two orbital lines are under construction.
Line 7 (pink) forms a near-complete loop around the city center. Its route follows the Inner Ring Road.

Line 8 (magenta) is a semi-circular southern orbital along the Outer Ring Road.

COMMUTER RAIL

An extensive network of commuter rail lines serves Delhi with the main terminal at New Delhi Railway Station.

It includes a loop line around the center.

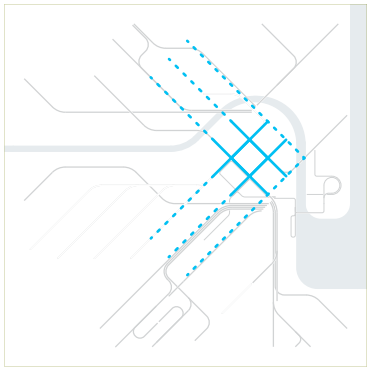
BOSTON

T, TRAM, TRAIN

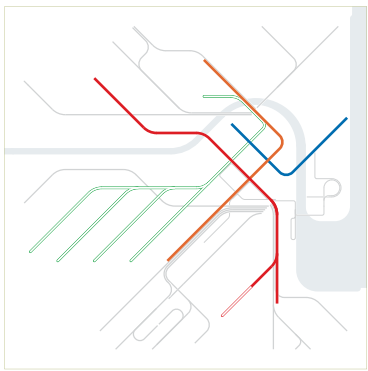
The city was founded on a peninsula surrounded by water on three sides, serving as a convenient harbor for ships and a suitable ground for land defenses.

Boston expanded along the peninsula to the south then across the water towards the north and west.

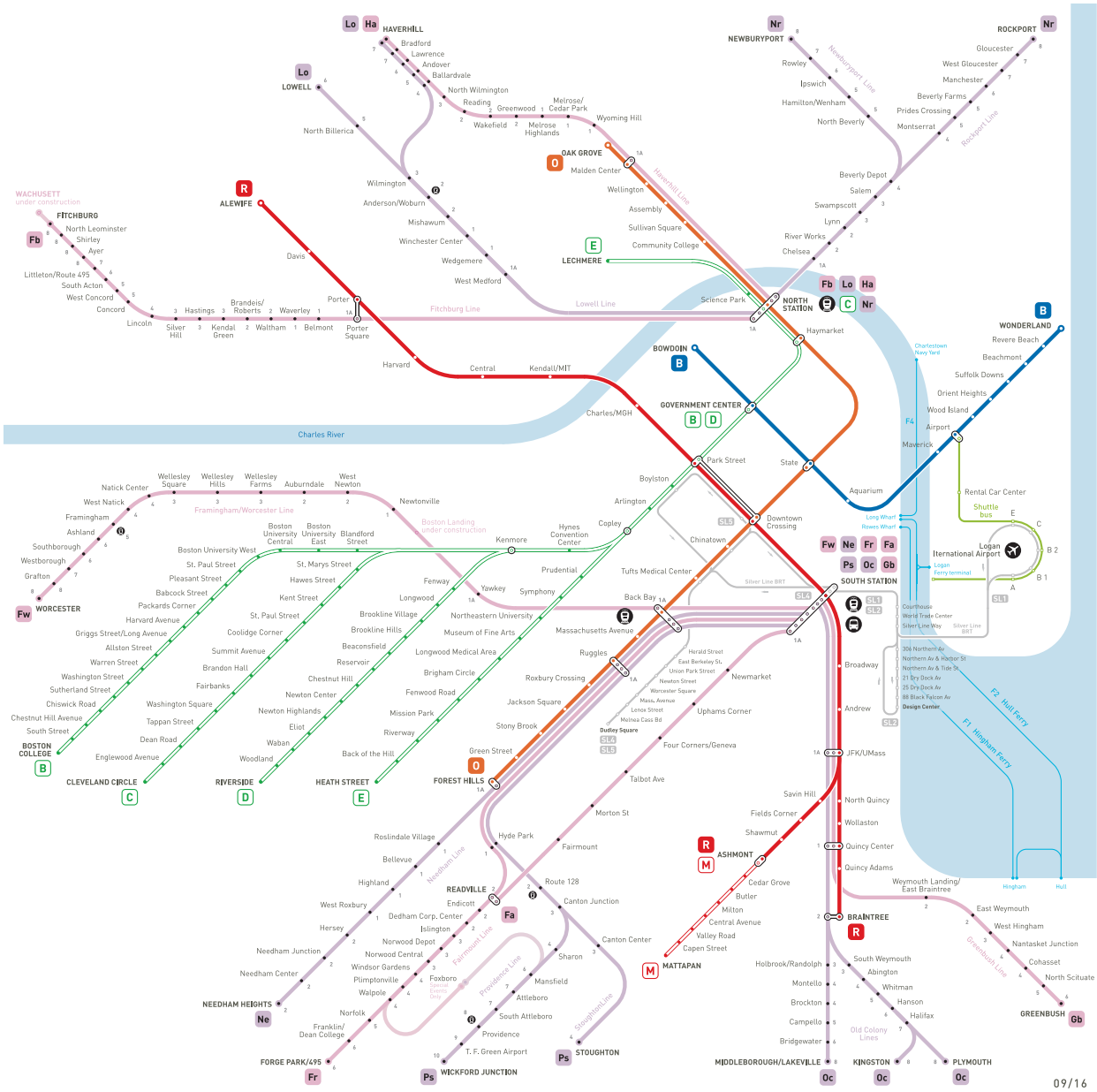
It is served by a multimodal transport network called the “T” whose lines converge in the historic center. Three subway lines and four grouped light rail lines intersect each other, forming the Downtown square. Commuter rail lines converge in two rail terminals north and south of the square.



STRUCTURE



SUBWAY NETWORK



BOSTON

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MUNICH

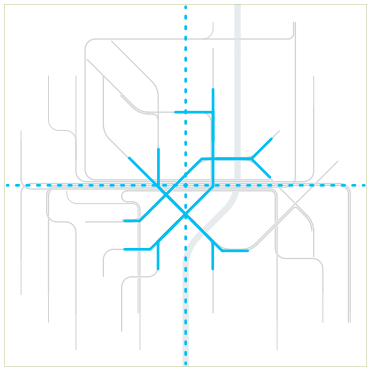
LINES DON'T RUN ALONE

The transit system in Munich is made of two complementary networks: the U-Bahn, or metro, and the S-Bahn, or commuter rail.

These two networks are organized in a similar fashion with common corridors for multiple lines.

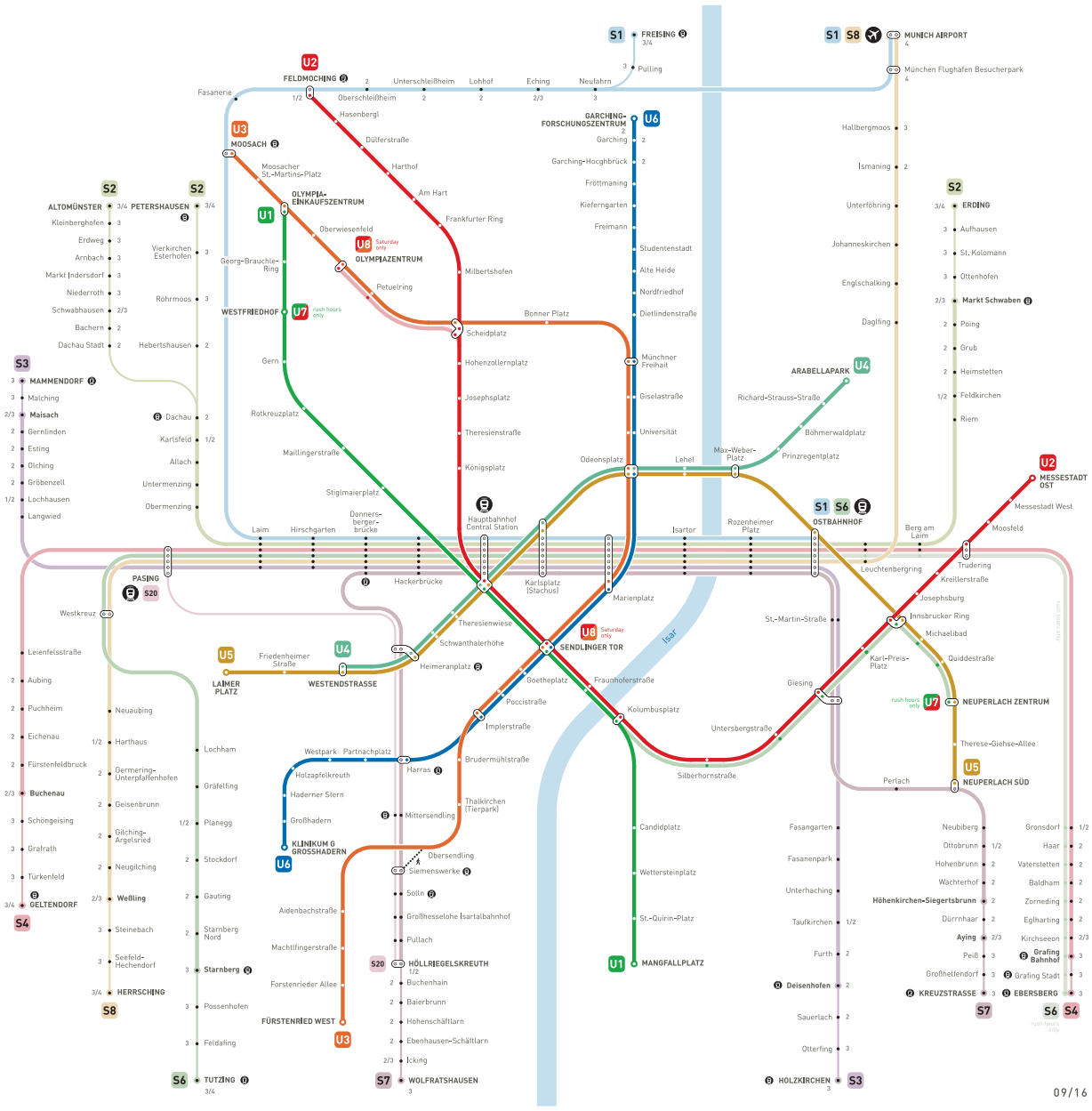
U-Bahn lines work in pairs. They share a corridor in the city center, then separate into independent branches. Three line pairs form a triangle intersected by the S-Bahn. Some special services create temporary pairs, linking corridors at will (U7, U8).

S-Bahn lines share a cross-city east-west corridor, then branch out towards the periphery. The central rail station, where all S-Bahn lines connect with two out of three metro corridors, is the main hub of the system.



STRUCTURE

U-BAHN NETWORK



MUNICH

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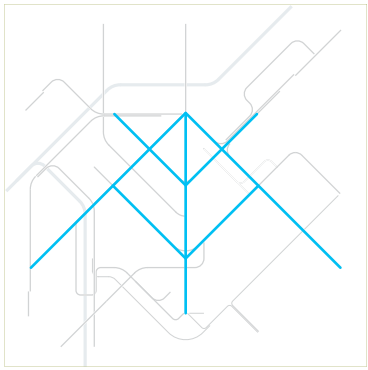
SÃO PAULO

THE QUADRANT

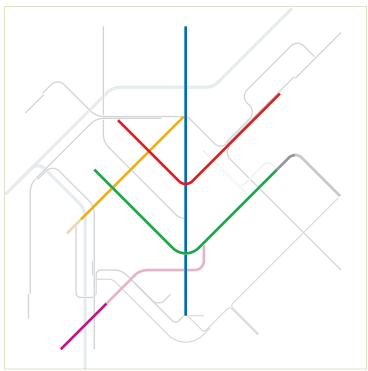
This immense Brazilian metropolis has spread out from its original core south of Rio Tietê across the surrounding plateau as far as the mountains allow. The urban area roughly forms a semi-circle with the historic center as its focal point.

Metro and commuter rail lines radiate straight out towards the periphery.

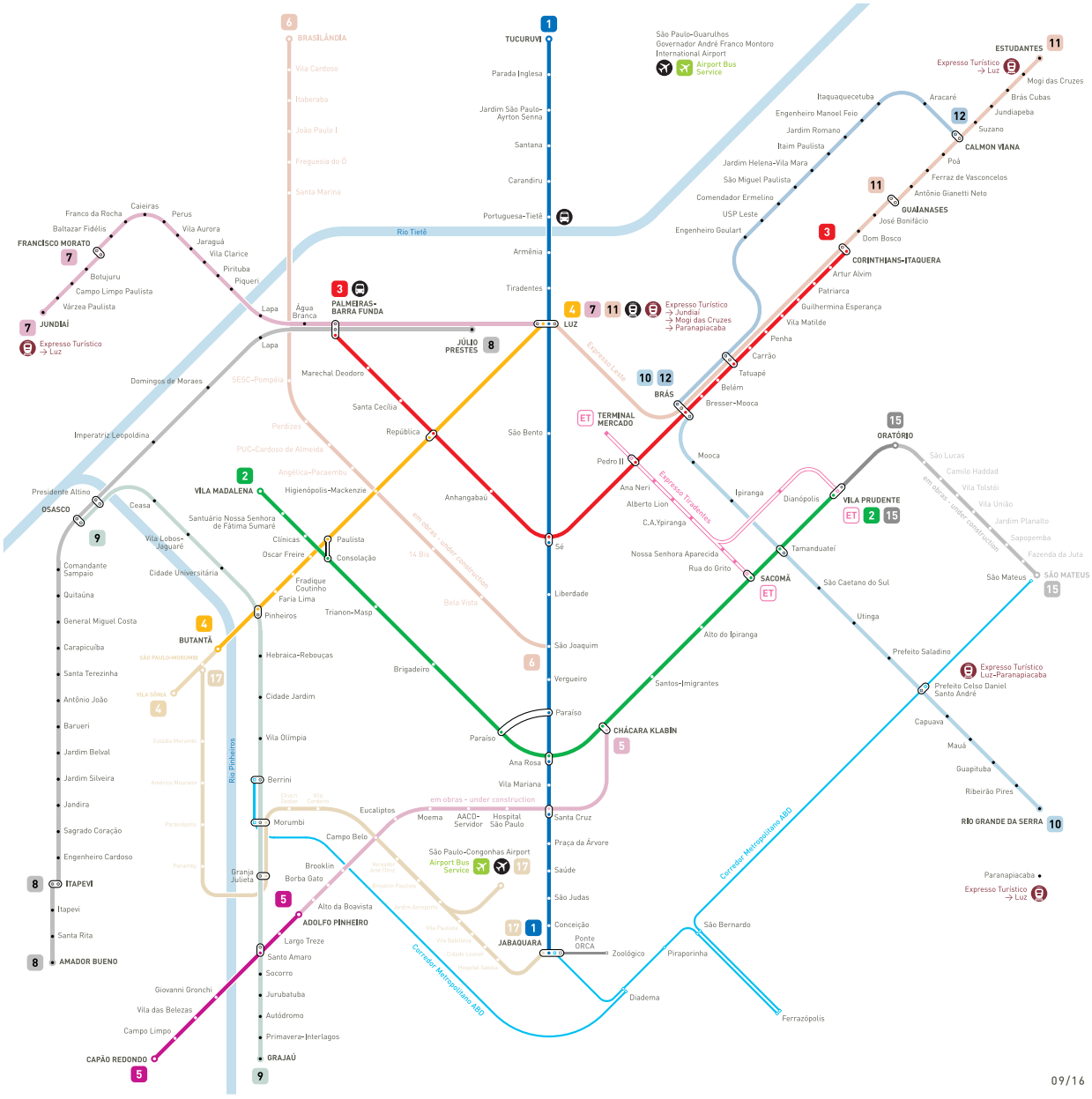
The even radial pattern is complemented by tangential lines which provide necessary cross-town connections.



STRUCTURE



METRÔ NETWORK



SÃO PAULO

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WASHINGTON

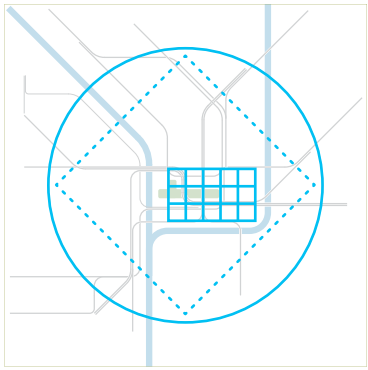
SYMBOLS FIRST

A square-shaped territory at the confluence of the Potomac and Anacostia rivers was allocated for the construction of the capital of the United States of America.

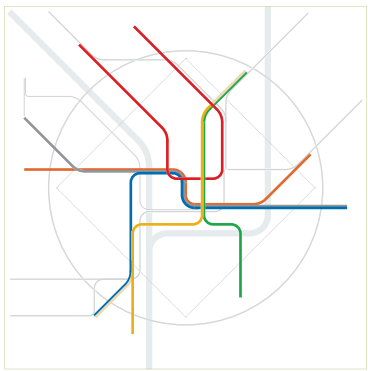
The city of Washington was planned as an orthogonal grid of streets between the rivers, intersected by diagonal avenues. At its center lies the National Mall, a wide, landscaped east-west esplanade.

A circular highway, the Capital Beltway, further enhances the peculiar status of the District of Columbia as a special enclave of power within the federation.

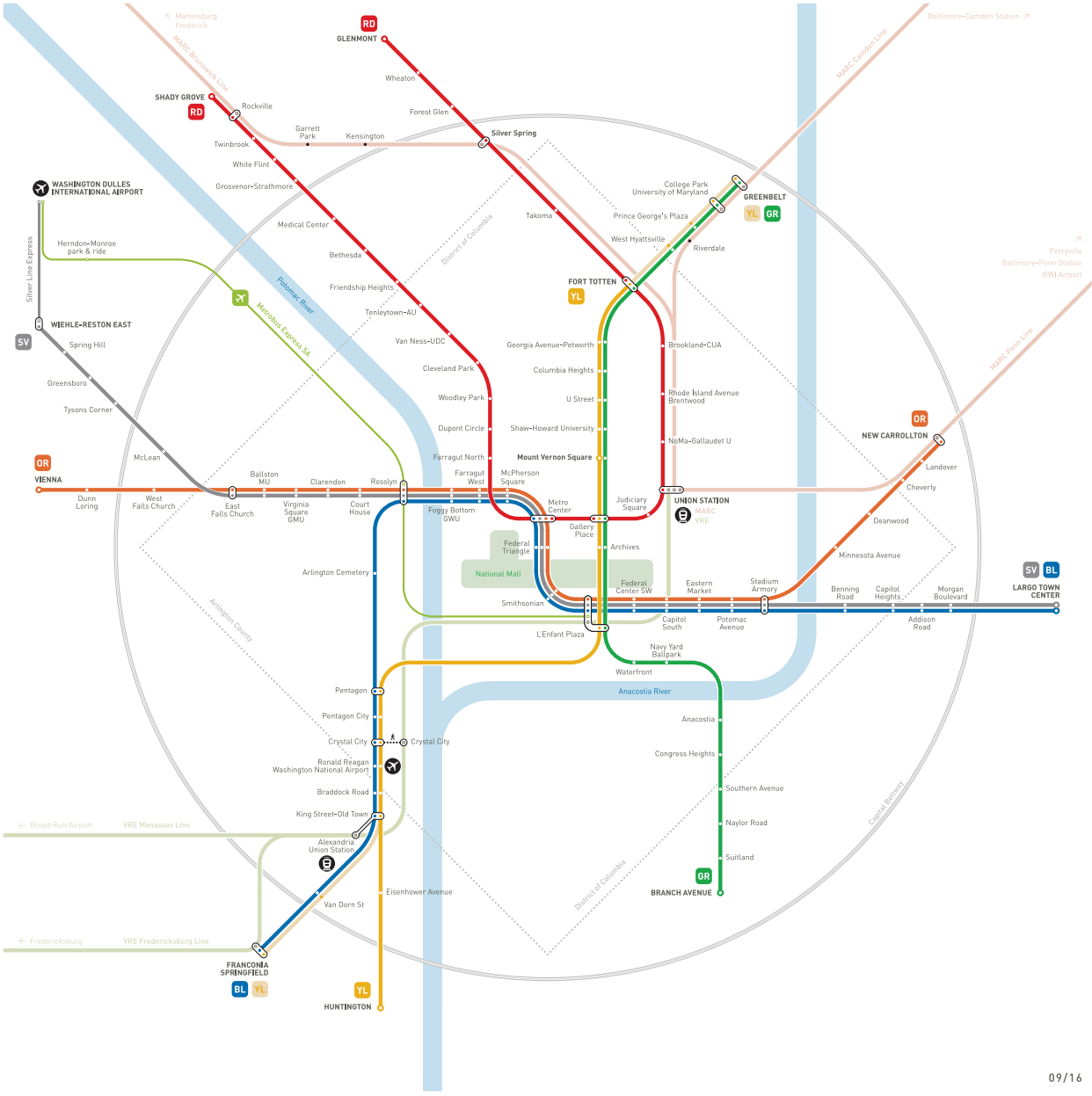
Three metro corridors, with one, two and three lines respectively, intersect inside the city center where their routes stick to an orthogonal street pattern. From there, lines radiate to the north and across the rivers towards the Beltway.



STRUCTURE



METRO NETWORK



09/16

WASHINGTON

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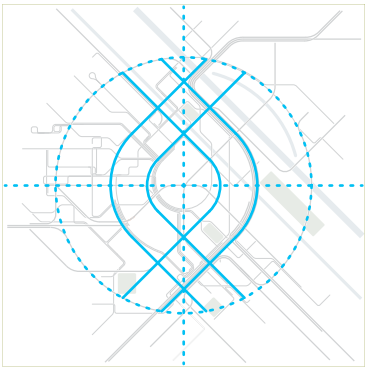
VIENNA

TAKE THIS WALTZ

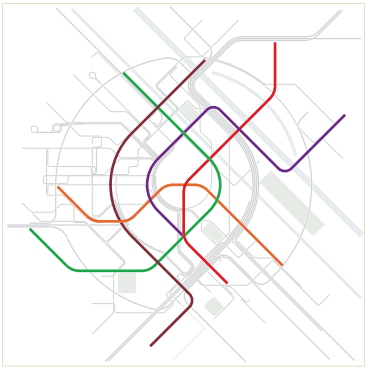
Vienna is a ballroom where lines swirl in pairs around the inner city. U-Bahn with U-Bahn, U-Bahn with S-Bahn, S-Bahn with S-Bahn.

Red and orange meet at the center.

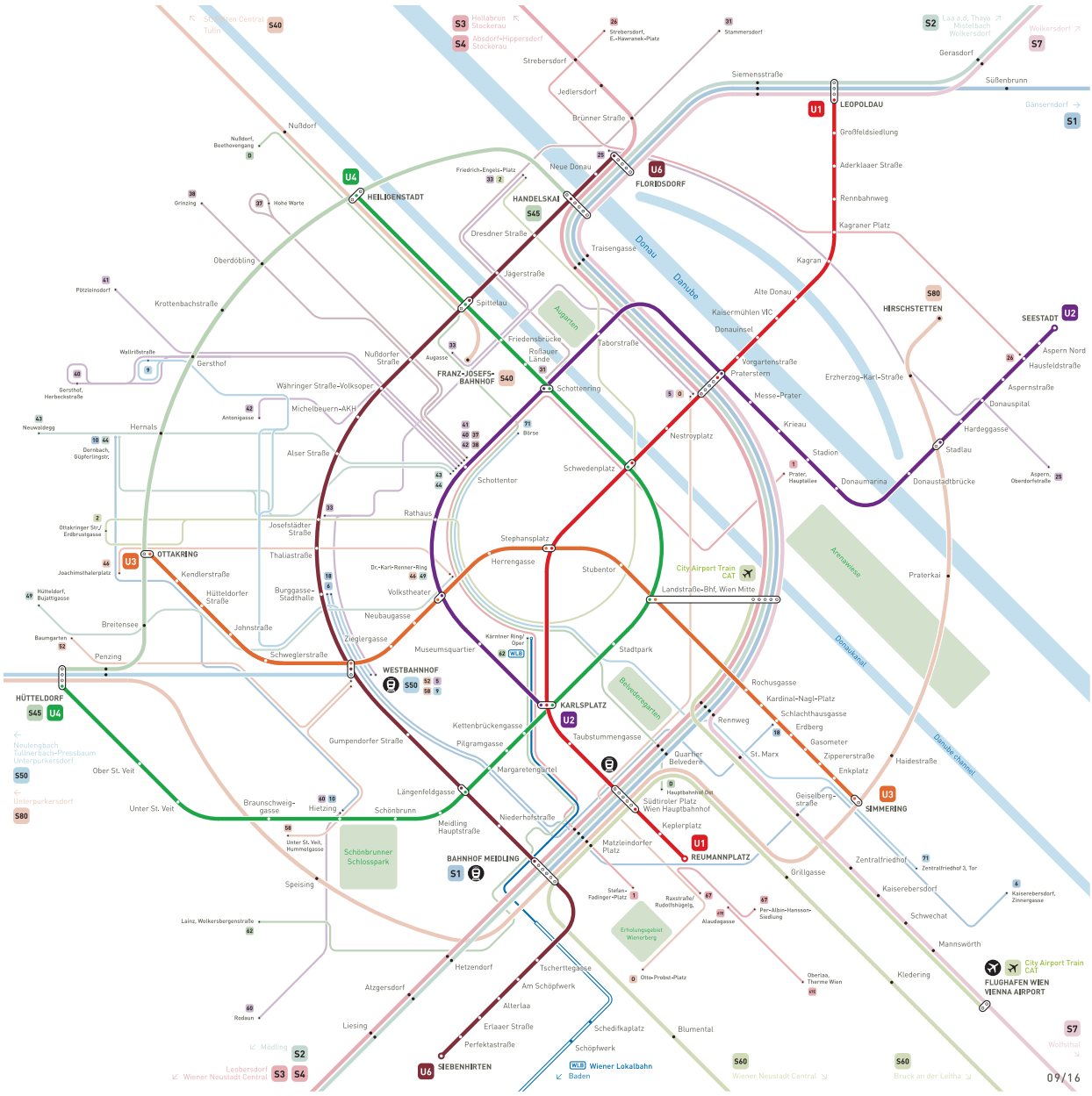
Purple grasps green to form the first ring, U-Bahn joins S-Bahn for the second, pastel orange and pastel green lead the third ring.



STRUCTURE



U-BAHN NETWORK



VIENNA

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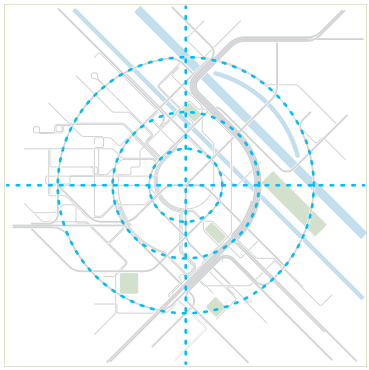
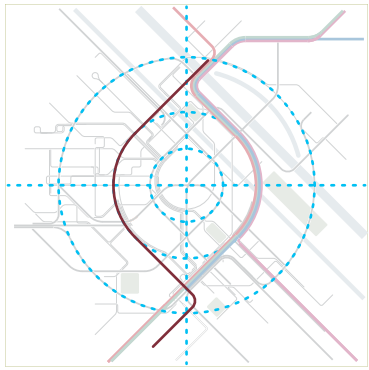
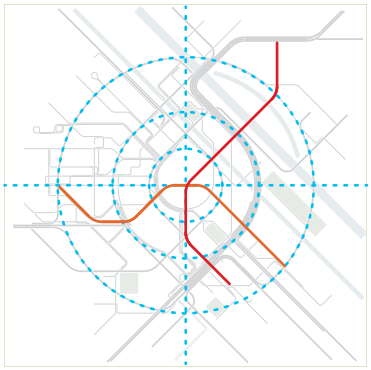


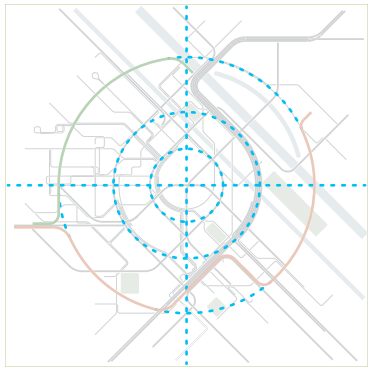
CITYSCAPE



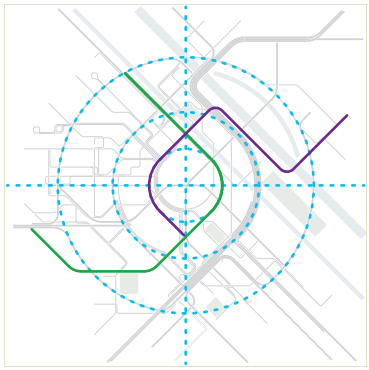
SECOND RING



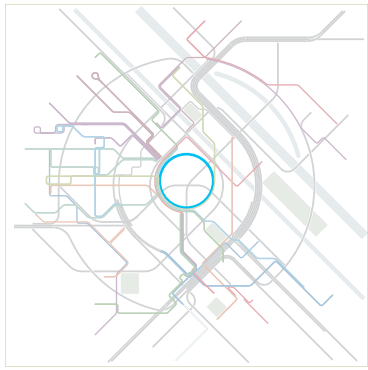
CENTRAL LINES



THIRD RING



FIRST RING



TRAMWAY

CITYSCAPE

The inner city is the focal point of three concentric rings forming the orbital transit system.

CENTRAL LINES

U1 (red) and U3 (orange) intersect right in the center of the inner city.

FIRST RING

U2 (purple) and U4 (green) follow the Ring Boulevard around the inner city.

SECOND RING

U6 (brown) in the west and the main S-Bahn corridor in the east together create the second ring.

THIRD RING

S-Bahn lines S80 (pastel orange) and S45 (pastel green) provide an orbital connection in the periphery.

TRAMWAY

An extensive tramway network fills the interstitial space between the rings.

Tramway lines radiate out from the Ring Boulevard which marks the inner city boundary.

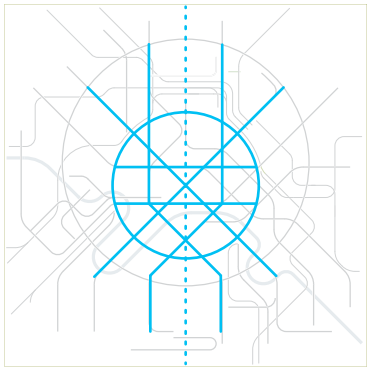
MOSCOW

SYMMETRY AND CENTRALITY

The capital of Russia is organized as concentric circles with the Kremlin at its heart. A series of ring boulevards reflect the gradual expansion of the city.

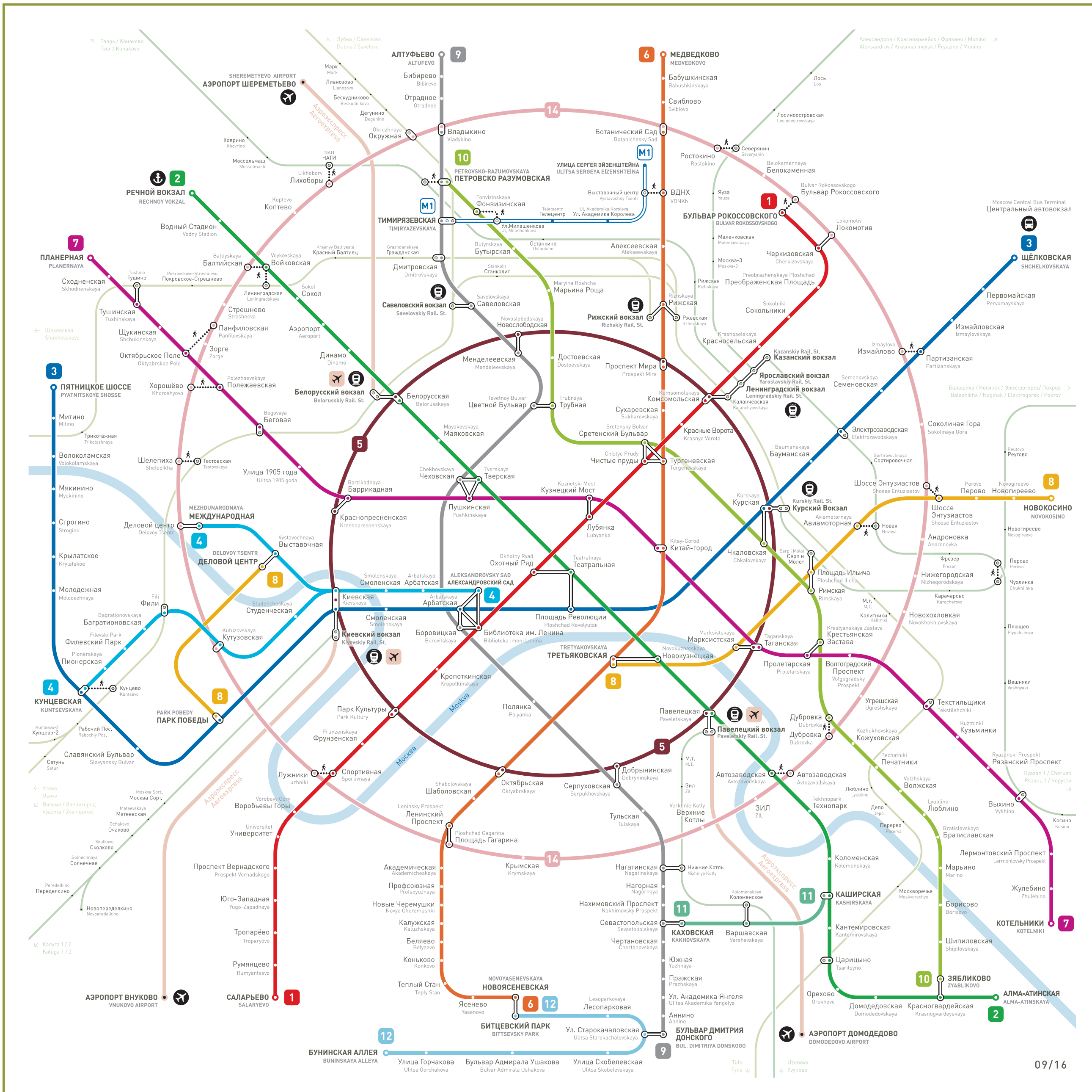
Likewise, a ring metro line encircles the historic center and connects all major rail terminals. Metro lines form a regular and symmetric pattern inside the circle with two lines (red and green) crossing it diagonally and intersecting in the very center. Seven more lines serve the central area and radiate in all directions towards the periphery.

An outer ring line connects all the radials, thus reinforcing the idea of centrality.



STRUCTURE

METRO NETWORK



MOSCOW

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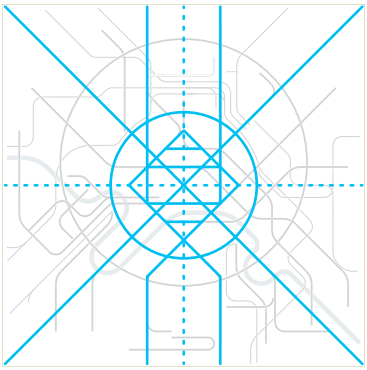
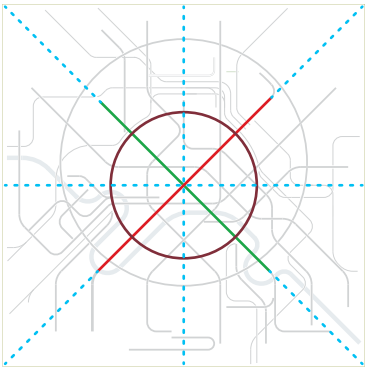
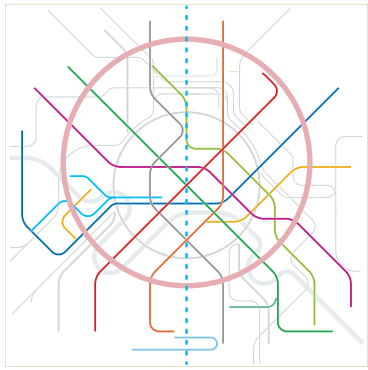


CITYSCAPE

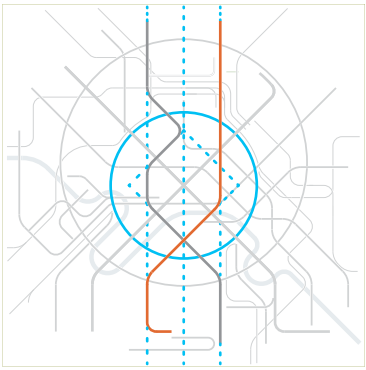
EAST-WEST



CIRCLE AND DIAGONALS



OUTER RING



NORTH-SOUTH

RAIL SERVICES

CITYSCAPE

A ring line marks the historic core of the city.

Metro lines converge towards the core and form a balanced symmetric pattern inside of it.

CIRCLE AND DIAGONALS

Line 1 (red) and 2 (green) diagonally cross the ring line 5 (brown) and intersect at its focal point.

NORTH-SOUTH

Line 6 (orange) and line 9 (grey) cross the center on symmetric north-south routes.

EAST-WEST

5 lines serve the central area on primarily east-west routes.

OUTER RING

The outer ring line 14 (pink) is an orbital connecting all radial metro lines outside of the city center.

RAIL SERVICES

Commuter rail lines (green) serve rail terminals around the ring line.

3 airport rail links (orange) connect the airports.


St Petersburg
Busan
San Francisco
Bay Area
Istanbul
Kuala Lumpur
Mumbai
Singapore

LANDSCAPE

The identity of many cities is deeply shaped by the dominant landscape hosting them. Wide rivers, steep mountains, and singular coastlines often constrain the shape of an urban area and offer a distinctive character and way of life.

In such a setting, the structure of a metro network is the result of its dual purpose: to serve the urban areas whose shape is constrained by landscape and to bridge physical obstacles separating areas from each other.

ISTANBUL

THE CROSSROADS OF ELEMENTS

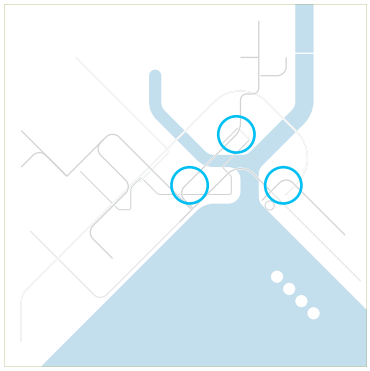
Istanbul owes its existence and splendor to a unique strategic position. It is located at the crossroads of the old world: the land route from Europe to Asia and the maritime route from the Mediterranean to the Black Sea. It was founded on a peninsula protected by the waters of the Marmara Sea to the south, the Bosphorus to the east and the Golden Horn, a natural harbor, to the north.

This site was so important and convenient that Roman emperor Constantine relocated the capital of the empire from Rome to Byzantium and gave it a name that would last for centuries, Constantinople.

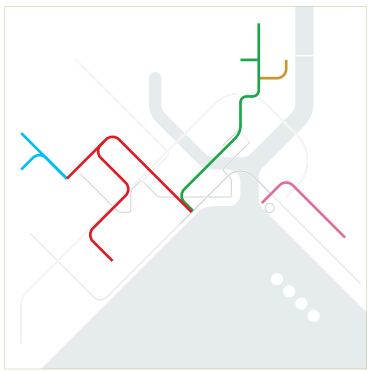
Modern Istanbul is a vast metropolis, far wider than the original peninsula which remains at its geographic center. It is spread over three land masses separated by the Bosphorus and the Golden Horn.

The metro network mirrors this distribution with one main line for each land mass. While the green line crosses the Golden Horn, the European and Asian parts of the metro network remain disconnected.

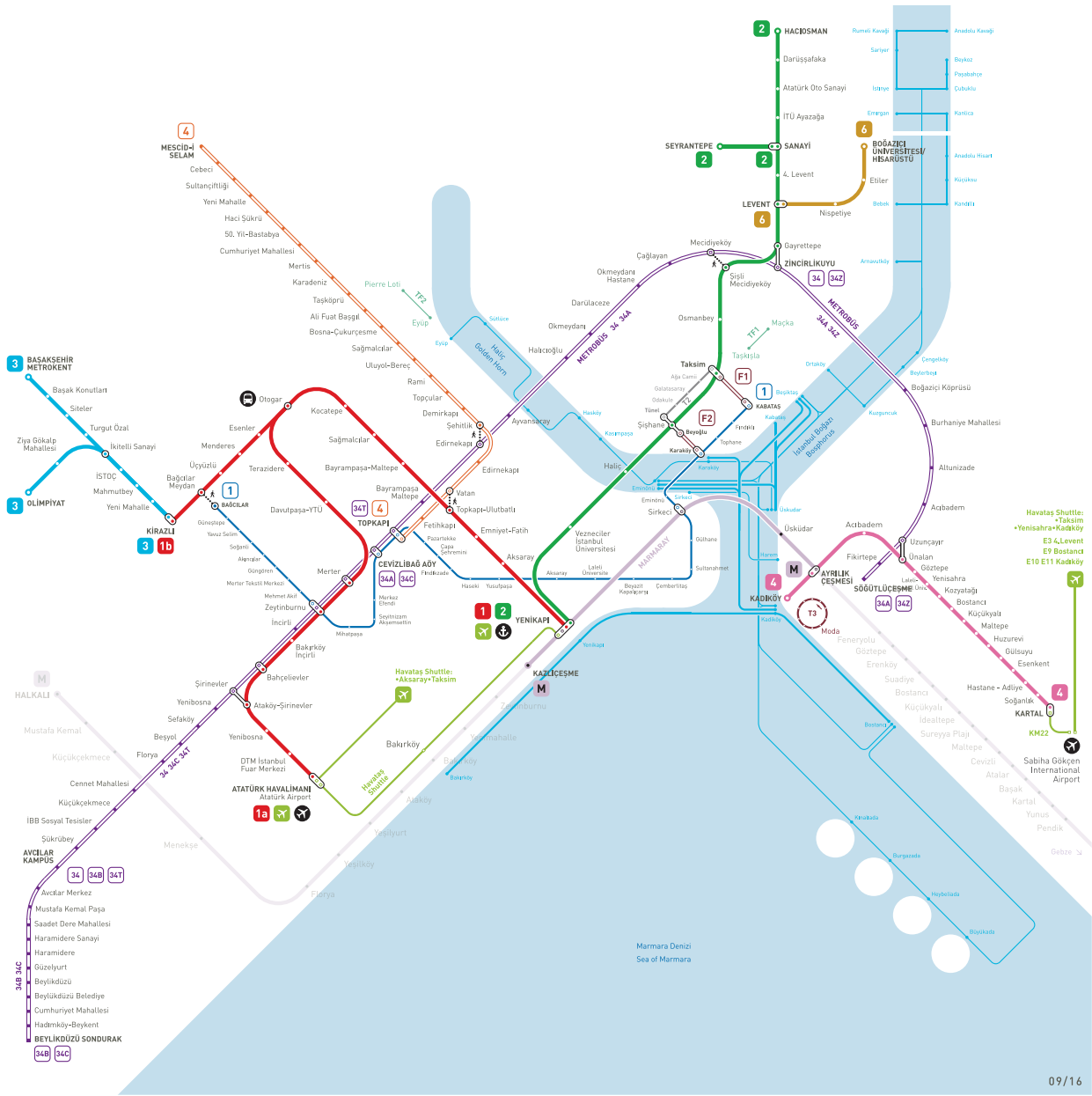
This gap is bridged by an orbital Bus Rapid Transit line running on a bridge over the Bosphorus and most importantly by the newly constructed Marmaray rail tunnel, the first rail connection between Europe and Asia hosting a cross-town commuter rail line.



STRUCTURE



METRO NETWORK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Boğaziçi Köprüsü
Burhaniye Mahallesi
Altunizade
Haliç
Eminönü
Sirkeci
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Uzunçayır
Fikirtepe
AYRILIK ÇEŞMESİ
SÖĞÜTLÜÇEŞME
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Edirnekapı
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Vatan
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Şükrübey
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Avcılar Merkez
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Haramidere Sanayi
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Ziya Gökalp Mahallesi
İSTOÇ
Mahmutbey
Yeni Mahalle
OLİMPİYAT
KİRAZLI
Marmara Denizi
Sea of Marmara
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ISTANBUL
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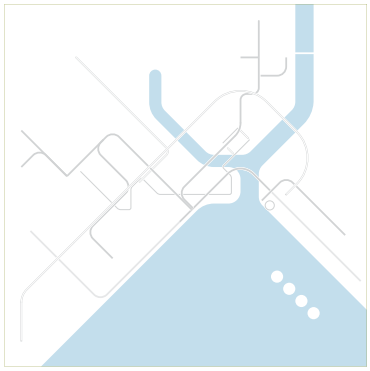
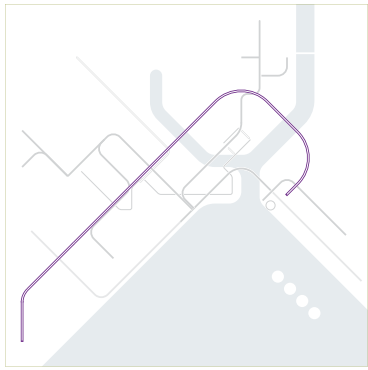
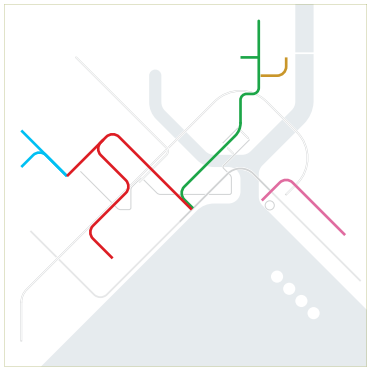


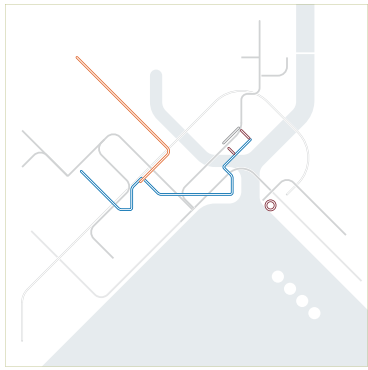
CITYSCAPE



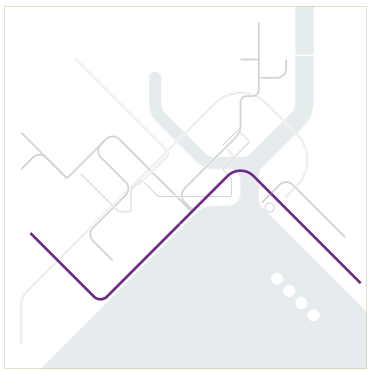
METROBÜS



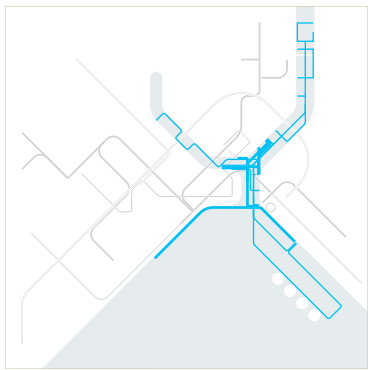
METRO



TRAMWAY AND FUNICULARS



MARMARAY



FERRY

CITYSCAPE

The European side is to the west, the Asian side to the east.

Between them is the Bosphorus strait and south of it the Marmara Sea.

The original city occupied the central peninsula on the European side.

METRO

All lines save one are on the western side and no metro lines cross the Bosphorus.

The European side network is composed of a succession of lines connected at their ends.

MARMARAY

The Marmaray tunnel connects the European and the Asian side of the city under the Bosphorus.

It is used by a cross-town commuter line which runs along the shores of the Sea of Marmara.

METROBÜS

Bus rapid transit lines use a dedicated and segregated right of way on a highway that bridges both the Golden Horn and the Bosphorus.

They provide an orbital cross-town link at the edge of the central urban core.

TRAMWAY AND FUNICULARS

Tramway line 1 (blue) serves the historic center and crosses the Golden Horn over a bridge.

2 funiculars connect the shores of the Bosphorus to the top of the hill that overlooks it north of the Golden Horn.

FERRY

The three landmasses are linked by a dense network of ferry lines crisscrossing the waterways.

M U M B A I

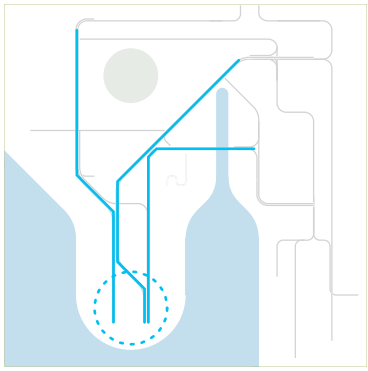
T H E F U N N E L P E N I N S U L A

In Mumbai, all roads lead to the tip of the peninsula. The city was first a Portuguese then English colonial outpost on a small group of islands named Bombay.
This original archipelago was progressively connected to the main peninsula through landfill and the city spread out to the north.

The economic center remained on the southern tip though and this funnel configuration created a giant bottleneck with transit flows from the entire metropolis converging into a single narrow corridor.

Three heavily overloaded rail lines converge from the outer suburbs to a few city center terminals. They form the backbone of the transit system. On these lines, services are differentiated: express services skip stations and reach faraway suburban neighborhoods while local services serve all stations along the way.

The single metro line (purple) north of the airport is perpendicular to these main flows and provides a unique east-west cross-town connection.



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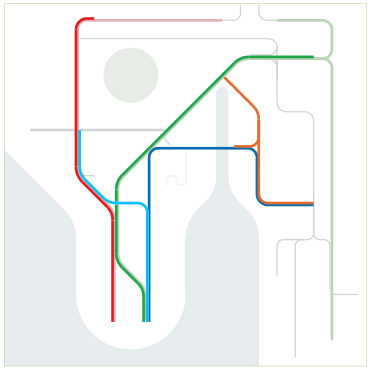
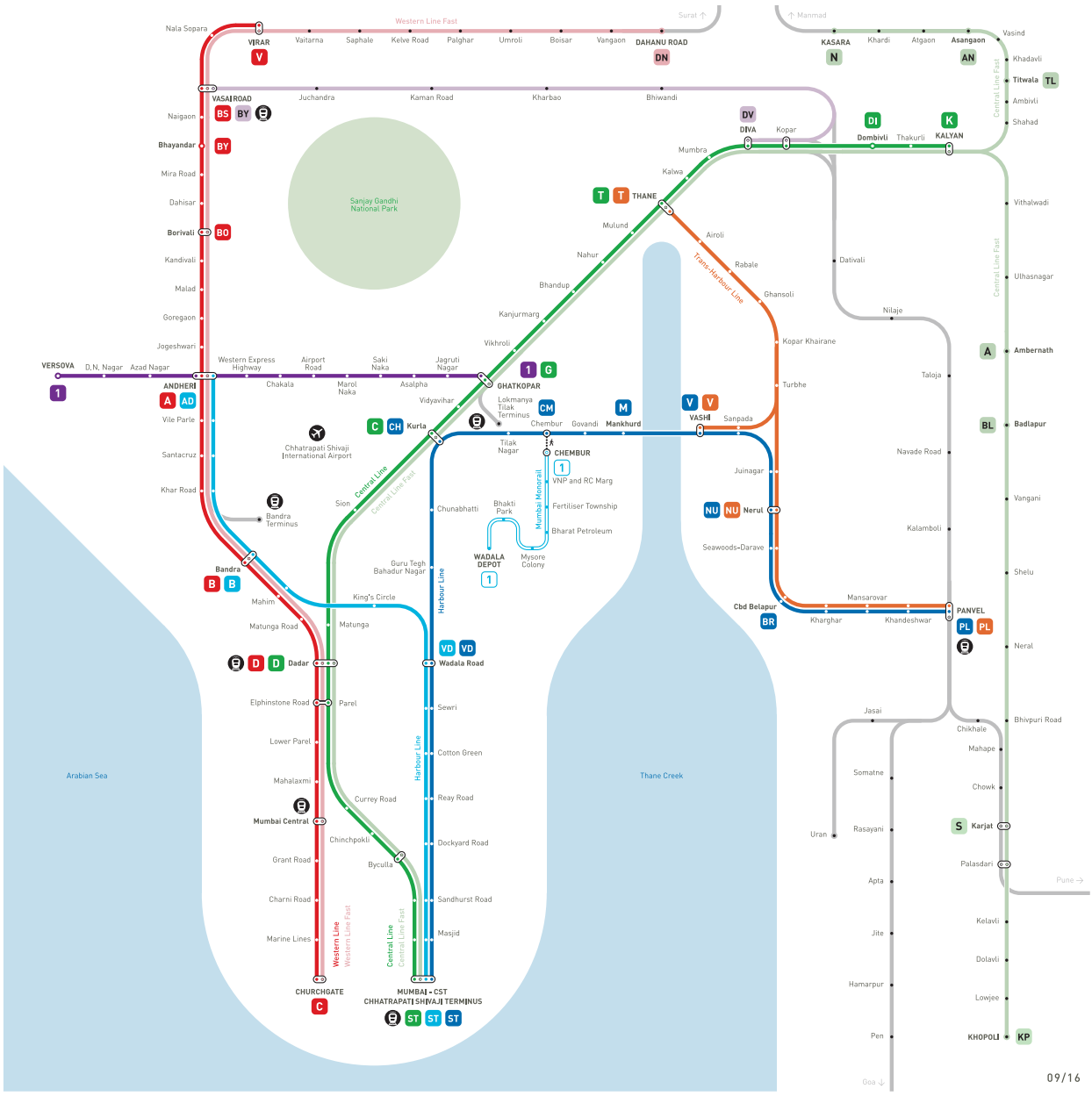


RAIL NETWORK



MUMBAI

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SINGAPORE

ISLAND, STATE, CITY

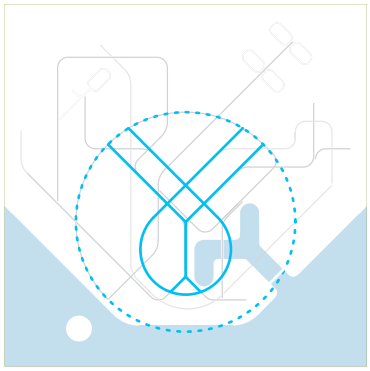
Strategically located at the entrance of Malacca Straits, Singapore is an insular city state at the crossroads of maritime trade routes. From the harbor bay on the southern shore of the island, the settlement expanded along the coast and towards the valleys of the interior, eventually spreading across the entire island. The bay itself was dammed to create a freshwater reservoir while the area to the south was reclaimed from the sea.

The city is served by 4 metro lines radiating from Downtown with names reflecting their direction of travel. When completed, the Downtown line (blue) will form a loop in the central area, all around Marina Bay, while the Circle line (yellow) already provides a peripheral orbital connection.

Five Automated People Mover lines (grey) connect local neighborhoods and feed metro lines into north-east and north-west suburbs.

Terminal stations in Singapore are labeled with numbers and each terminal has its own unique number. For example, the East West line goes from 1 to 2.

All the way north lies the Woodlands train station from which trains connect Singapore to Malaysia on the mainland.



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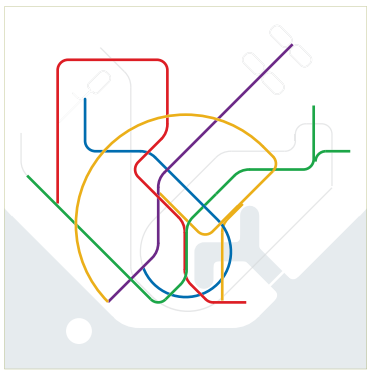
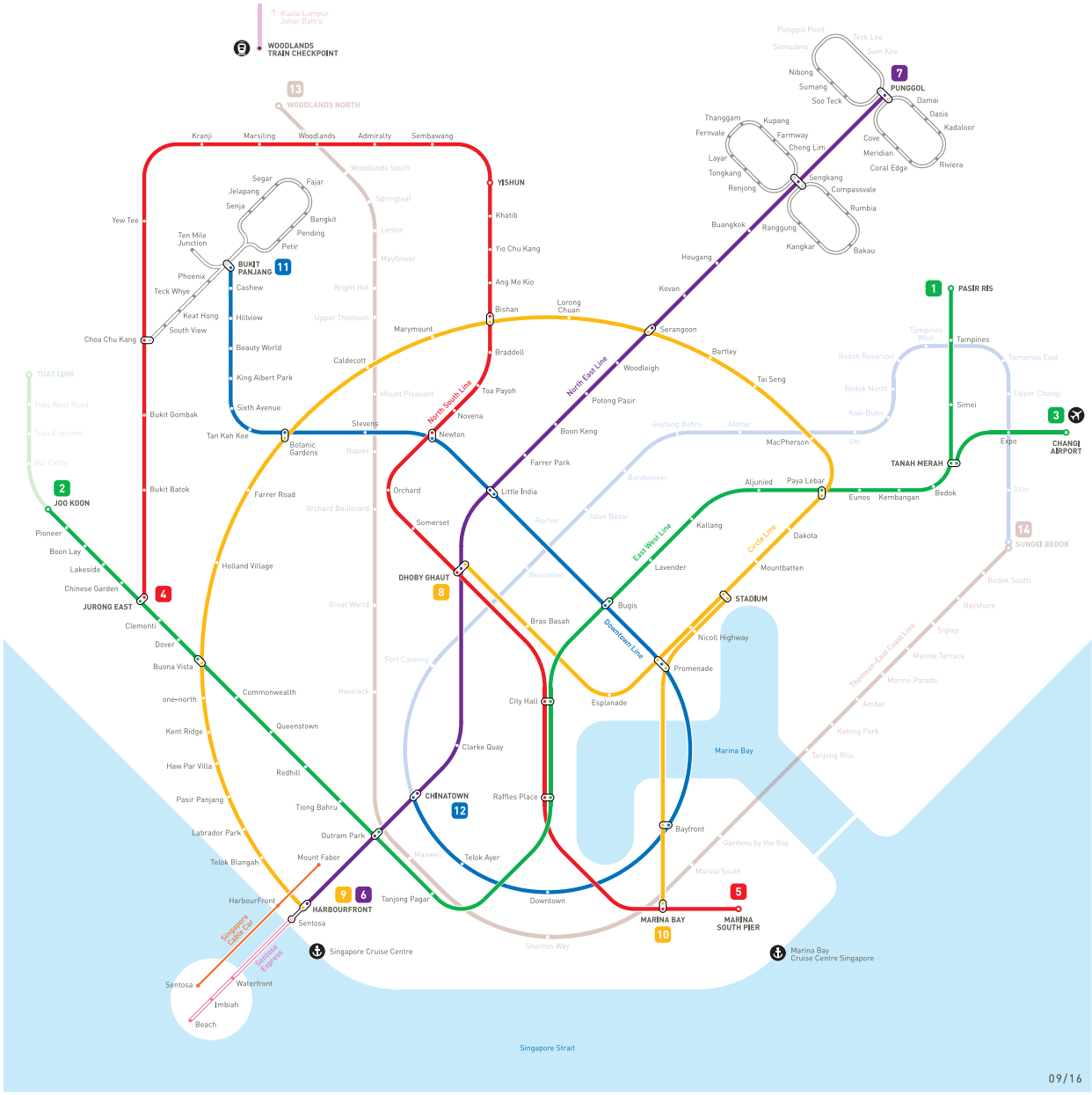


MRT NETWORK



SINGAPORE

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KUALA LUMPUR

A VALLEY IN THE HILLS

The original site of Kuala Lumpur is the narrow Klang River valley. The city developed along the river, between the surrounding hills, before spreading out into the adjacent valleys and towards the coastal plain.

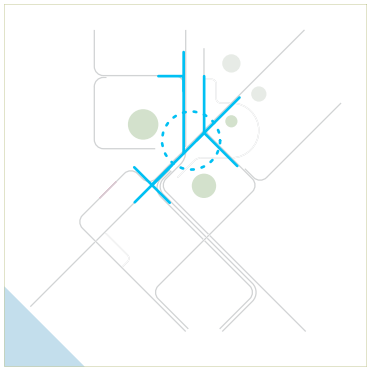
The transit network plainly reflects this particular geographic setting as all lines run along a common corridor along the length of the valley.

Commuter rail lines (pastel blue and red) converge from the north at Putra, share the corridor, then branch out after KL Sentral.

Metro lines (LRT pink and brown) each run along half of the corridor, intersect at Masjid Jamek then continue towards the east.

Airport lines start at KL Sentral, the gate of the valley.

A local monorail line (light green) encircles the city center.



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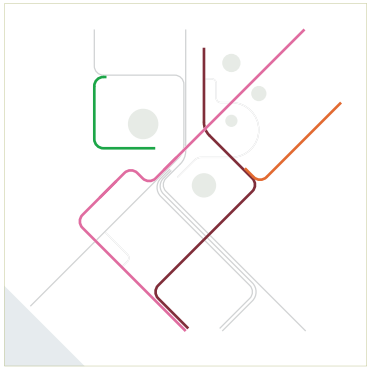
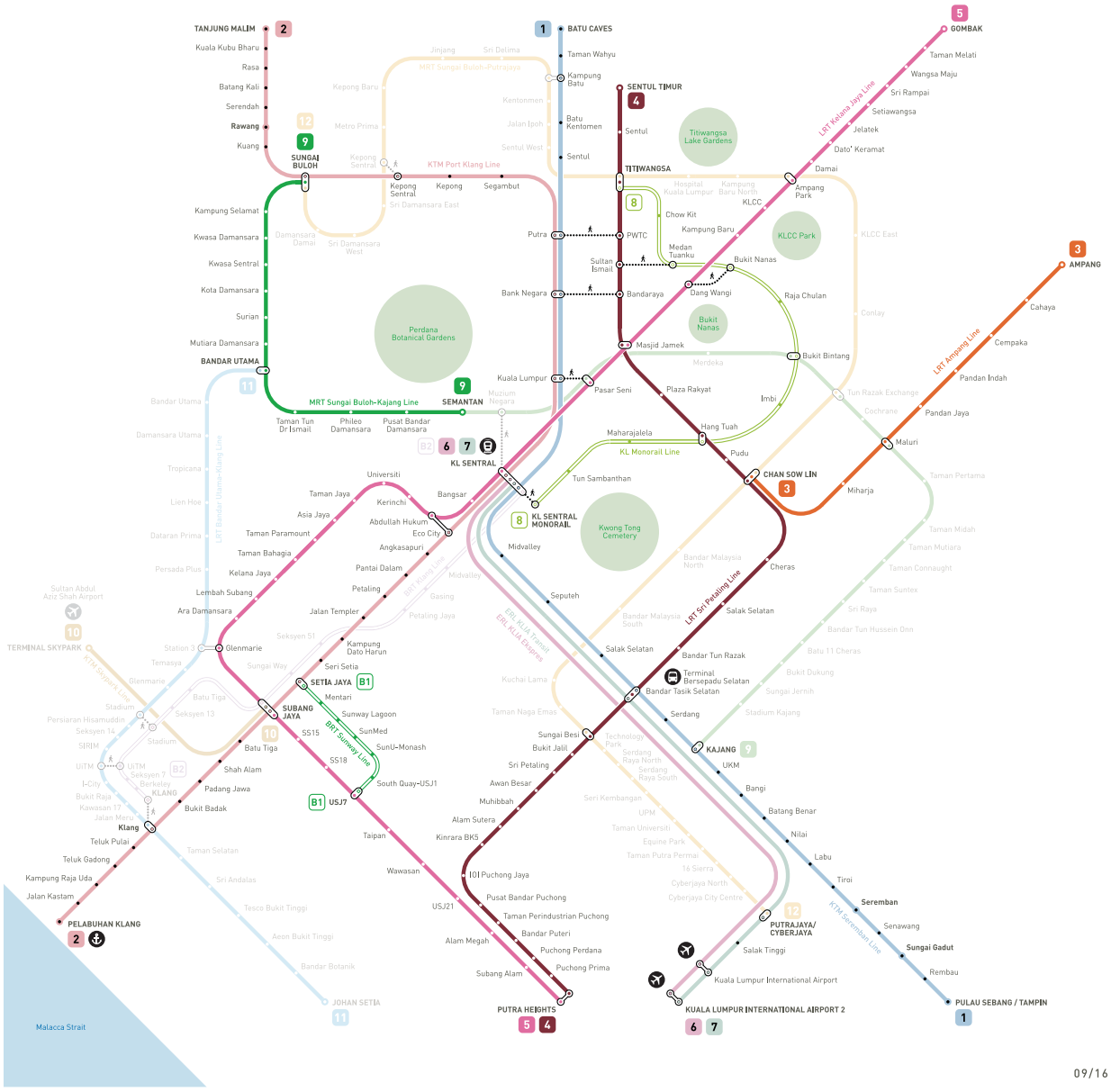


LRT-MRT NETWORK



KUALA LUMPUR

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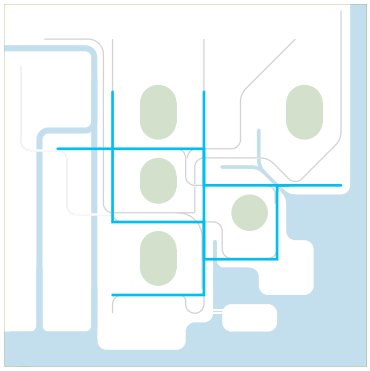
BUSAN

WHERE SEA AND MOUNTAINS DID COLLIDE

At the southeastern tip of the Korean peninsula, steep mountains plunge into the sea, leaving little space for a metropolis.

Busan originally developed from two spots: the southern port city in a bay sheltered by an island and the inland city further north. As both settlements expanded, they merged and kept spreading across the little land that was available—the shores and narrow valleys between the mountains. The resulting shape is a city composed of a series of interconnected urban strips.

Similarly to the built area, the metro lines meander around the mountains and along the shore, reproducing the existing urban pattern underground. One line (orange) follows the central valley north-south from the inland city to the harbor, while three other lines hug the mountains and connect the other valleys and coastal areas.



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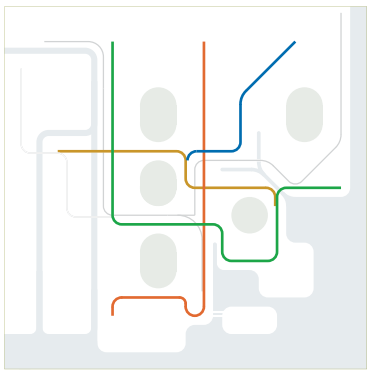
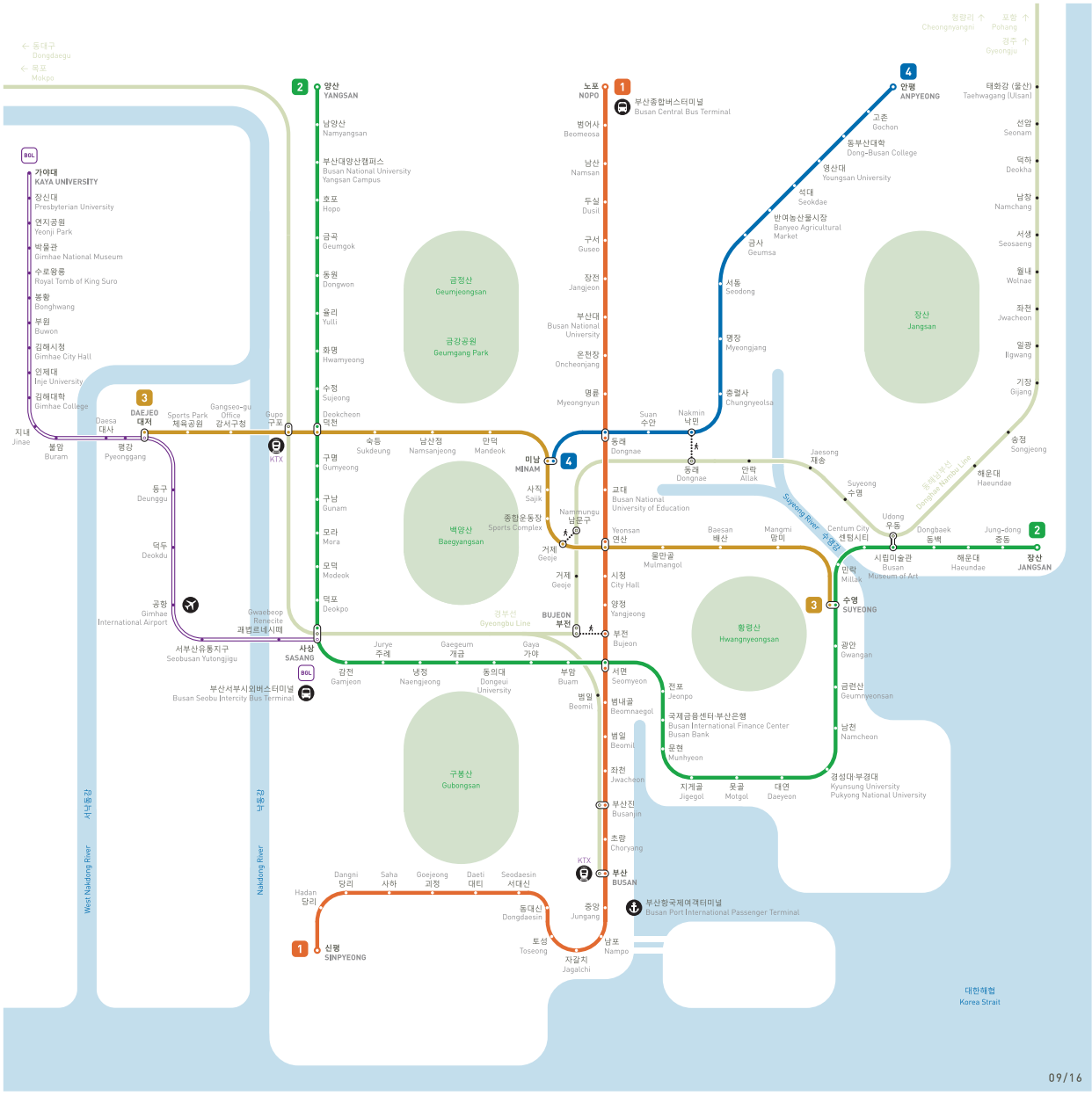


METRO NETWORK


BUSAN
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SAN FRANCISCO BAY AREA

CHOOSE YOUR SIDE

The bay is surrounded by a linear city or, better said, a string of interconnected cities. San Francisco occupies the rectangular peninsula to the west at the mouth and center of the bay. Across the strait lie Oakland and the East Bay while San Jose and Silicon Valley lie all the way south. The Bay Area is a region-sized conurbation linked by a collection of disparate transit systems.

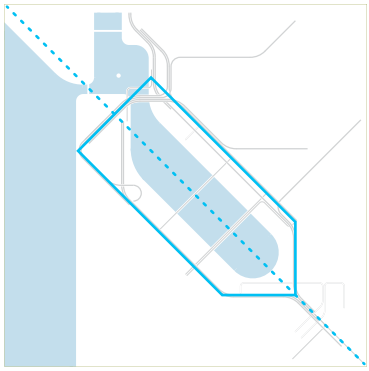
Bay Area Rapid Transit (BART) connects San Francisco with the East Bay. From San Francisco to Oakland, all lines share a common corridor and behave much like a subway, later branching out to follow individual routes.

San Francisco proper is served by the local Muni light rail network, again with a common Downtown corridor and lines branching out, this time towards the south and west.

The Peninsula is served by Caltrain commuter rail from San Francisco through Stanford towards San Jose.

Two more commuter rail lines serve the East Bay: ACE connecting San Jose with the San Joaquin Valley and Amtrak all along the shore.

A number of ferry routes offer cross-bay service to and from San Francisco and three bus lines operate on trans-bay bridges further south.



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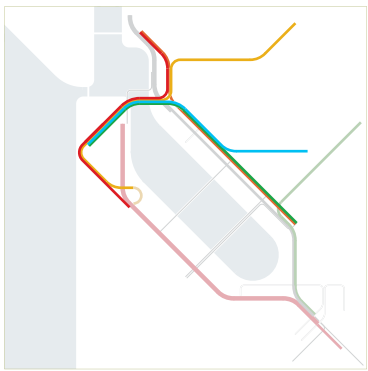
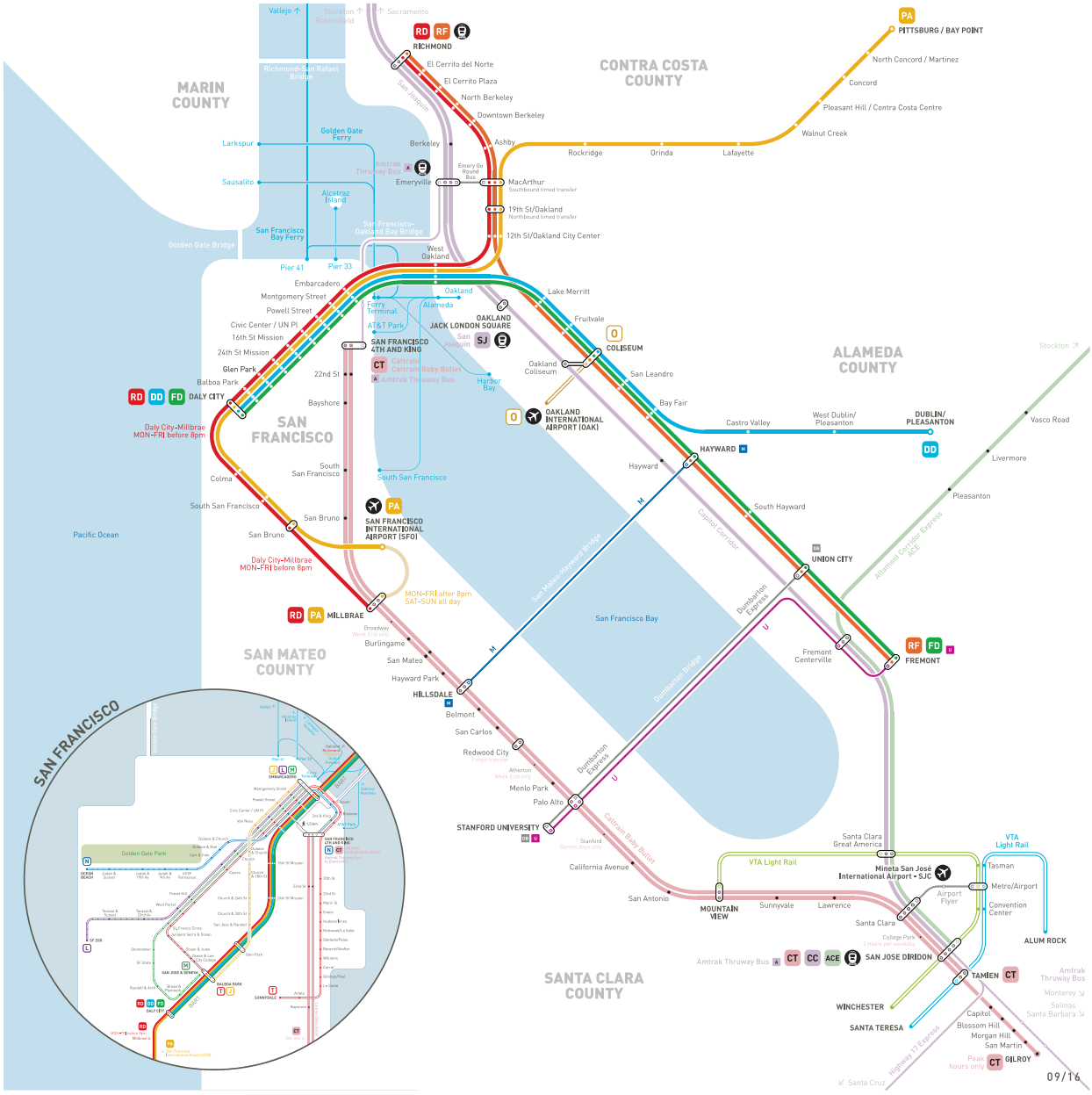


TRANSIT NETWORK



SAN FRANCISCO BAY AREA

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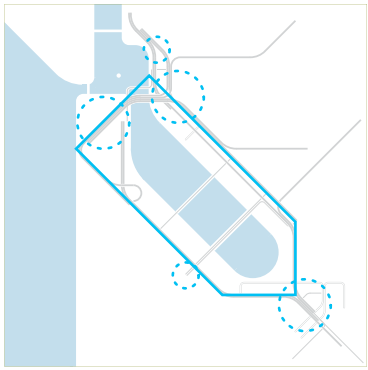
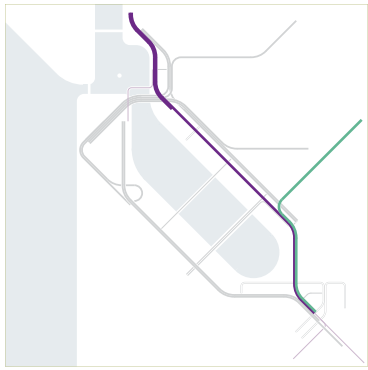
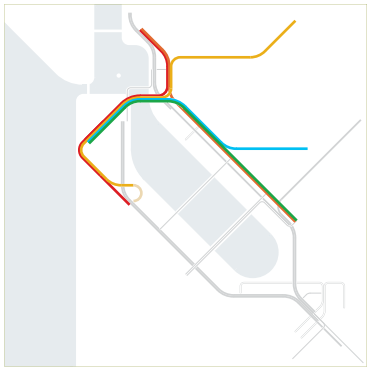


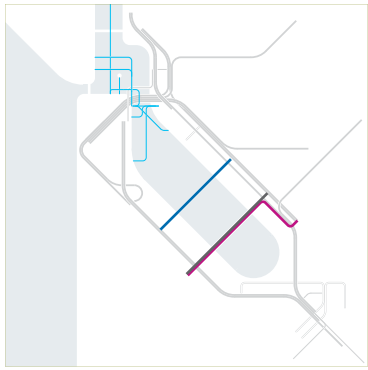
CITYSCAPE



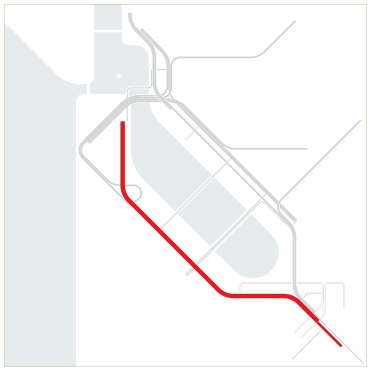
EAST BAY RAIL



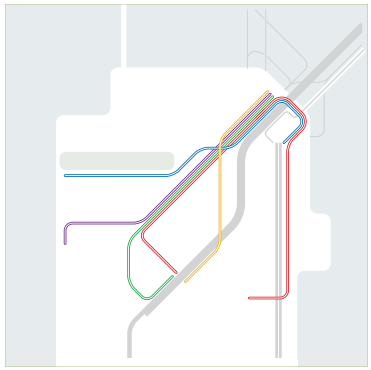
CROSS-BAY RAIL



CROSS-BAY BUS AND FERRY



PENINSULA RAIL



SAN FRANCISCO LIGHT RAIL

CITYSCAPE

The city of San Francisco is on the northern tip of the peninsula separating the bay from the Pacific Ocean.

Across the bay to the east is Oakland.

At the southern end of the bay are San Jose and Silicon Valley.

The University of California, Berkeley is north of Oakland, Stanford is northwest of San Jose.

CROSS-BAY RAIL

4 BART lines cross the strait from the East Bay to San Francisco. They share a common corridor in the west and radiate into individual branches in the east.

1 BART line runs along the East Bay.

PENINSULA RAIL

Caltrain connects San Francisco to San Jose along the western shore of the bay. An express skip-stop service, Baby Bullet, operates at peak hours.

A transfer to BART is available at Millbrae.

EAST BAY RAIL

Amtrak San Joaquin in the north.

Amtrak Capitol Corridor all along the bay.

Altamont Corridor Express-ACE in the south.

CROSS-BAY BUS AND FERRY

Ferries operate in the northern half of the bay.

Bus services operate over bridges in the southern half.

SAN FRANCISCO LIGHT RAIL

Muni Metro is a light rail network serving San Francisco city proper. Lines share a common cross-town underground corridor then branch out into individual surface lines.

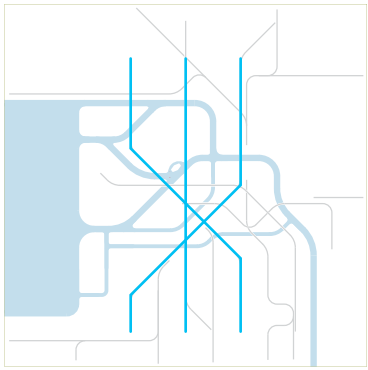
SAINT PETERSBURG

A STATEMENT OF MASTERY

Saint Petersburg was built from scratch in an inhospitable swampy delta where the Neva River empties into the Baltic Sea. The new capital was a declaration of ambition, a port city open to the world, a barren marsh transformed into a lively metropolis located on the very border of the rising Russian Empire confident in its strength and bright future.

Just as the foundation of the city and its construction are a testimony to mankind's mastery of its environment, its metro network is a splendid illustration of the capacity of an underground transport network to obliterate physical obstacles.

Metro lines run north-south or east-west deep underground and directly connect insular neighborhoods while simply ignoring the waterways above them. They form a network totally independent of physical contingencies whose logic is subordinated to transport requirements only. It is a true statement of mastery of engineering over landscape and the elements.



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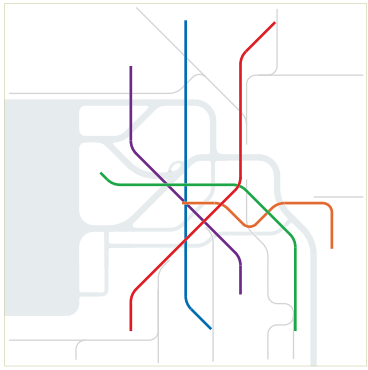
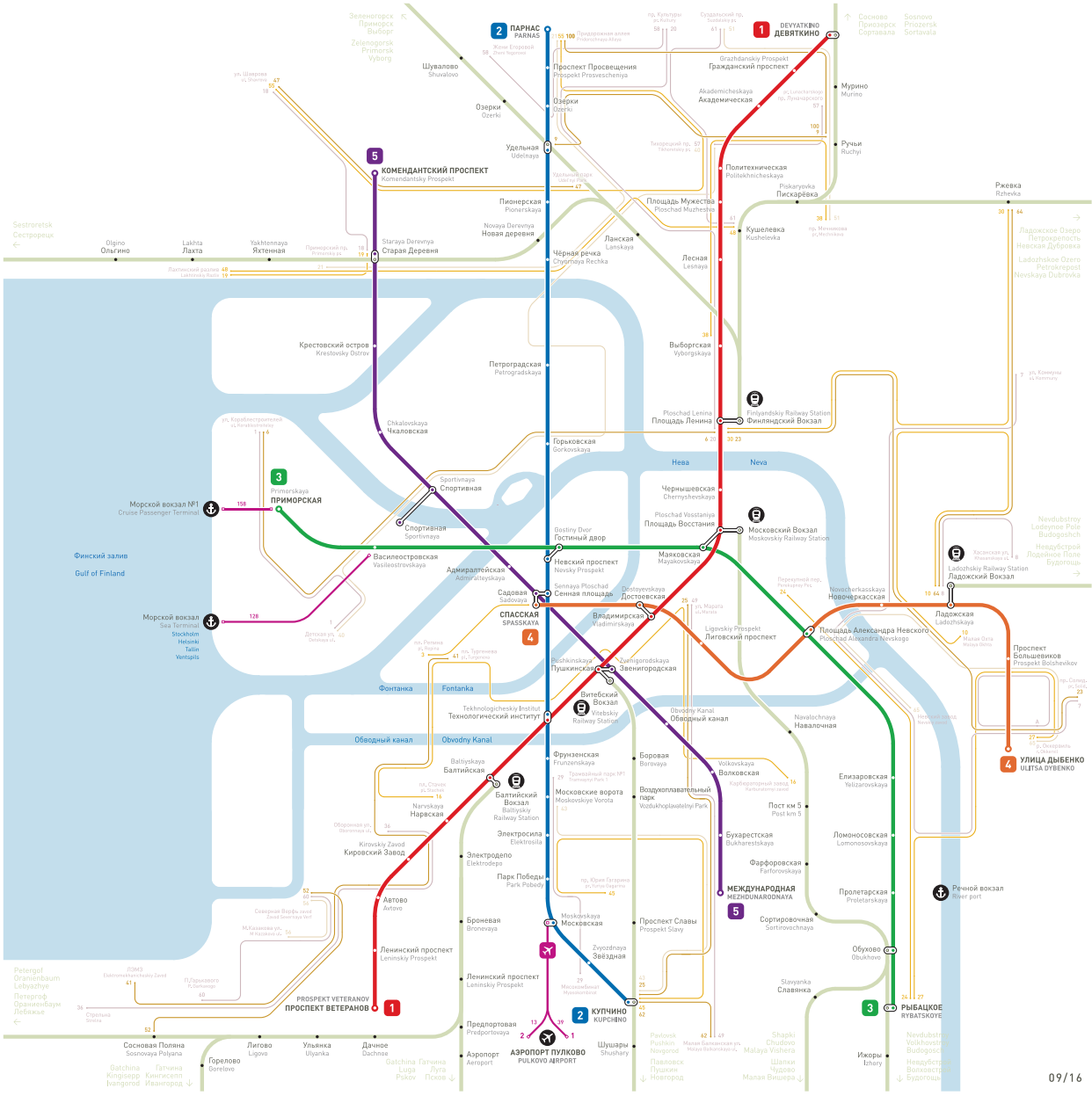


METRO NETWORK



SAINT PETERSBURG

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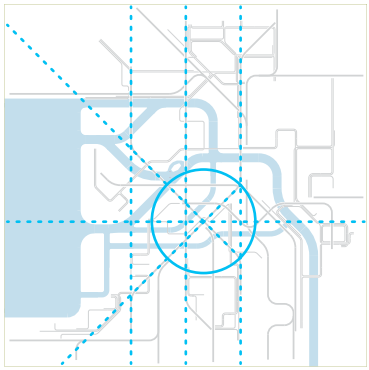
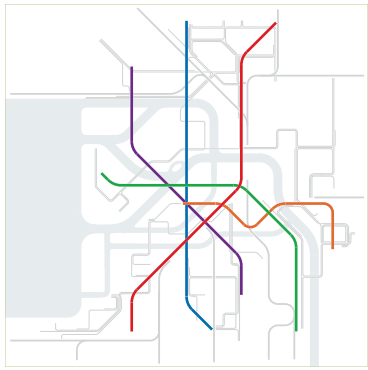
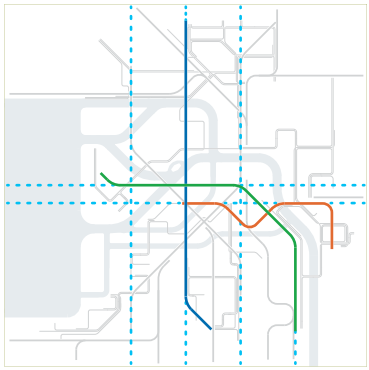


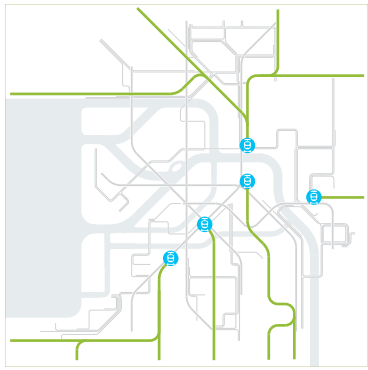
CITYSCAPE



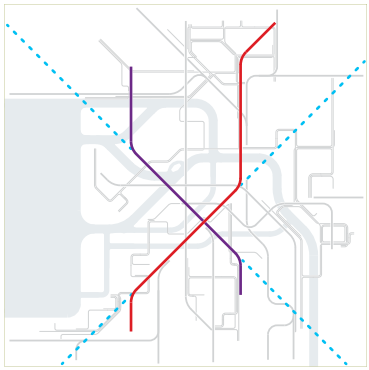
METRO



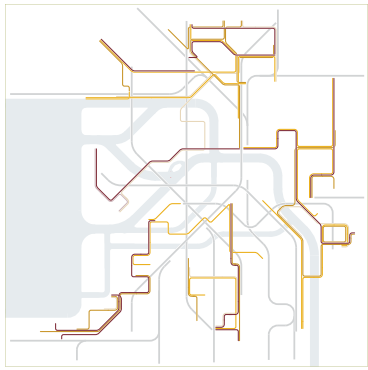
ORTHOGONAL



COMMUTER RAIL



DIAGONAL



TRAMWAY

CITYSCAPE

The city is built on an archipelago in the Neva River delta.

The historic center is located south of the Peter and Paul fortress (small hexagonal island).

To the west is the Gulf of Finland.

ORTHOGONAL

Line 2 (blue) runs on a north-south axis, lines 3 (green) and 4 (orange) run east-west.

DIAGONAL

Lines 1 (red) and 5 (purple) cross the city center diagonally.

METRO

Metro lines form a dense web inside the central historic area and connect it to the rest of the city.

They are organized independent of waterway obstacles.

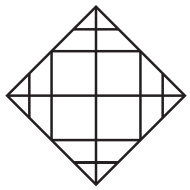
COMMUTER RAIL

Commuter rail lines originate from 5 separate rail terminals and never cross the Neva.

TRAMWAY

The tramway network provides local and tangential connections supplementing the metro outside of the inner urban core. The line colors indicate service frequency, with darker colored lines being more frequent.


Beijing
Tianjin
Xi'an
Nanjing
Shanghai
Chengdu
Wuhan
Hangzhou
Chongqing
Guangzhou
Shenzhen
Hong Kong



CHINA

In just one generation China has transformed from a country where cities sporting a metro system were exceptions to one where they are the norm. Far from promoting nationwide uniformity, this building frenzy has produced a great variety of network configurations illustrating the specificities of each metropolis.

As the scale and pace of development are unprecedented in history, projected and under construction lines are shown on maps to highlight the ongoing continuous building process.

XI'AN

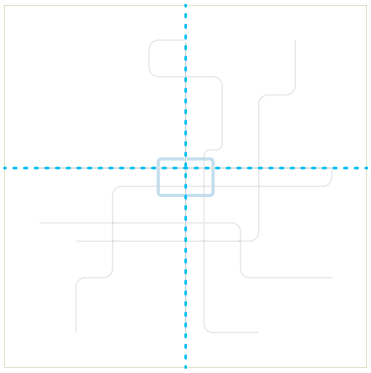
CARDO AND DECUMANUS

When China was unified for the first time, with its capital near modern Xi'an, Rome embraced an expansionist policy which would see it dominate the entire Mediterranean basin. The two empires formed a seemingly natural balance in the old world for centuries to come with one vast and powerful state at each extremity.

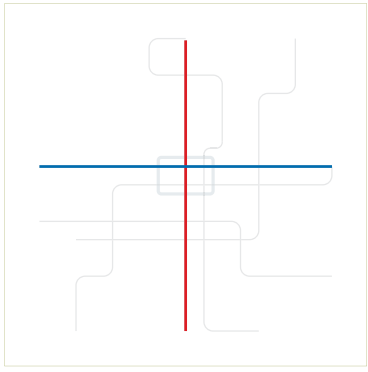
Surprisingly enough, a similar urban pattern emerged in both realms, with rectangular cities organized along two main avenues intersecting at a right angle. Romans called the north-south street Cardo and the east-west street Decumanus.

This archetypal shape is still present in Xi'an. The old city is enclosed inside a rectangular city wall surrounded by a moat as two perpendicular avenues connect four gates corresponding to four cardinal directions.

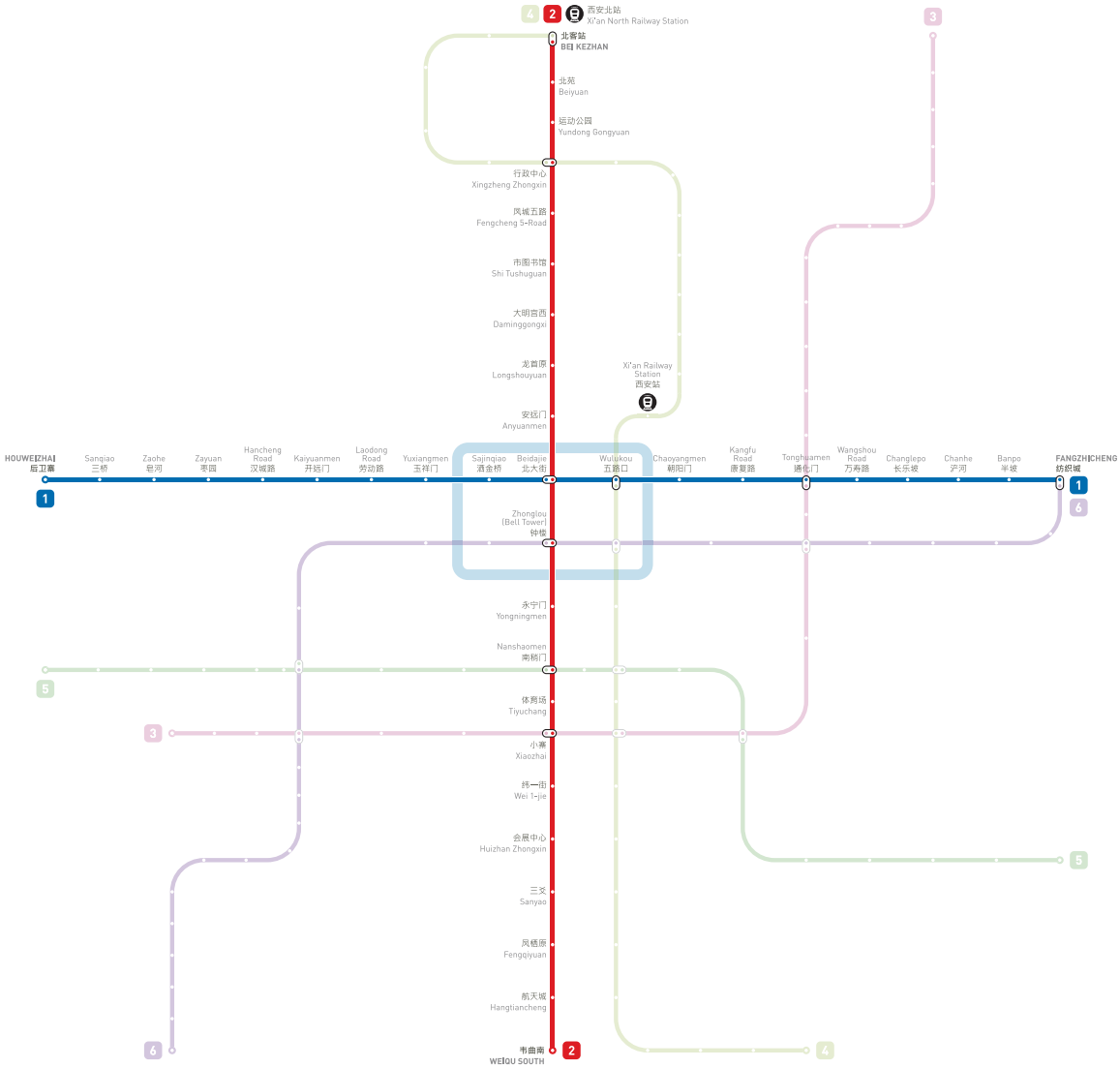
The metro network reproduces the same layout with two straight and perpendicular lines as a contemporary tribute to millennia of urban history.



STRUCTURE



METRO NETWORK



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XI'AN

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HANGZHOU

THE FOUR STATES OF WATER

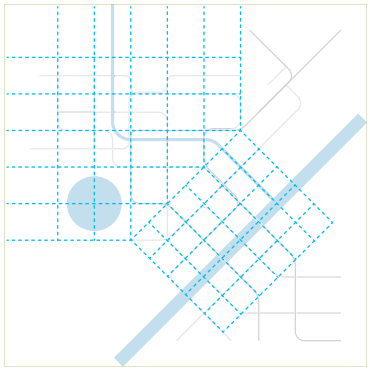
Water defines the landscape of Hangzhou.

Calm waters of the scenic West Lake which made the city's reputation as a place of beauty.

Flowing freshwater of the Qiantang River whose estuary widens into the Hangzhou Bay on the Yellow Sea.

A saltwater tidal bore which reaches all the way to the city during high tide.

Still waters of the Grand Canal, the ancient man-made waterway connecting Hangzhou in the south to Beijing in the north. Ever since its construction, the canal has been a vital supply line for the safe shipping of grain from the fertile Yangtze delta to the northern plain as well as the main trade route of eastern China, thus cementing the famed prosperity of Hangzhou.



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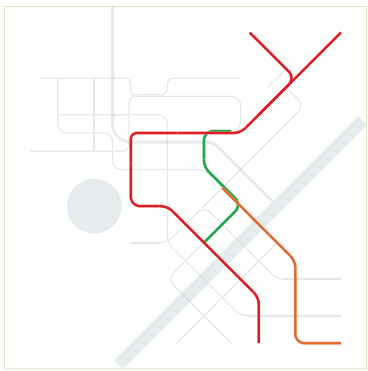
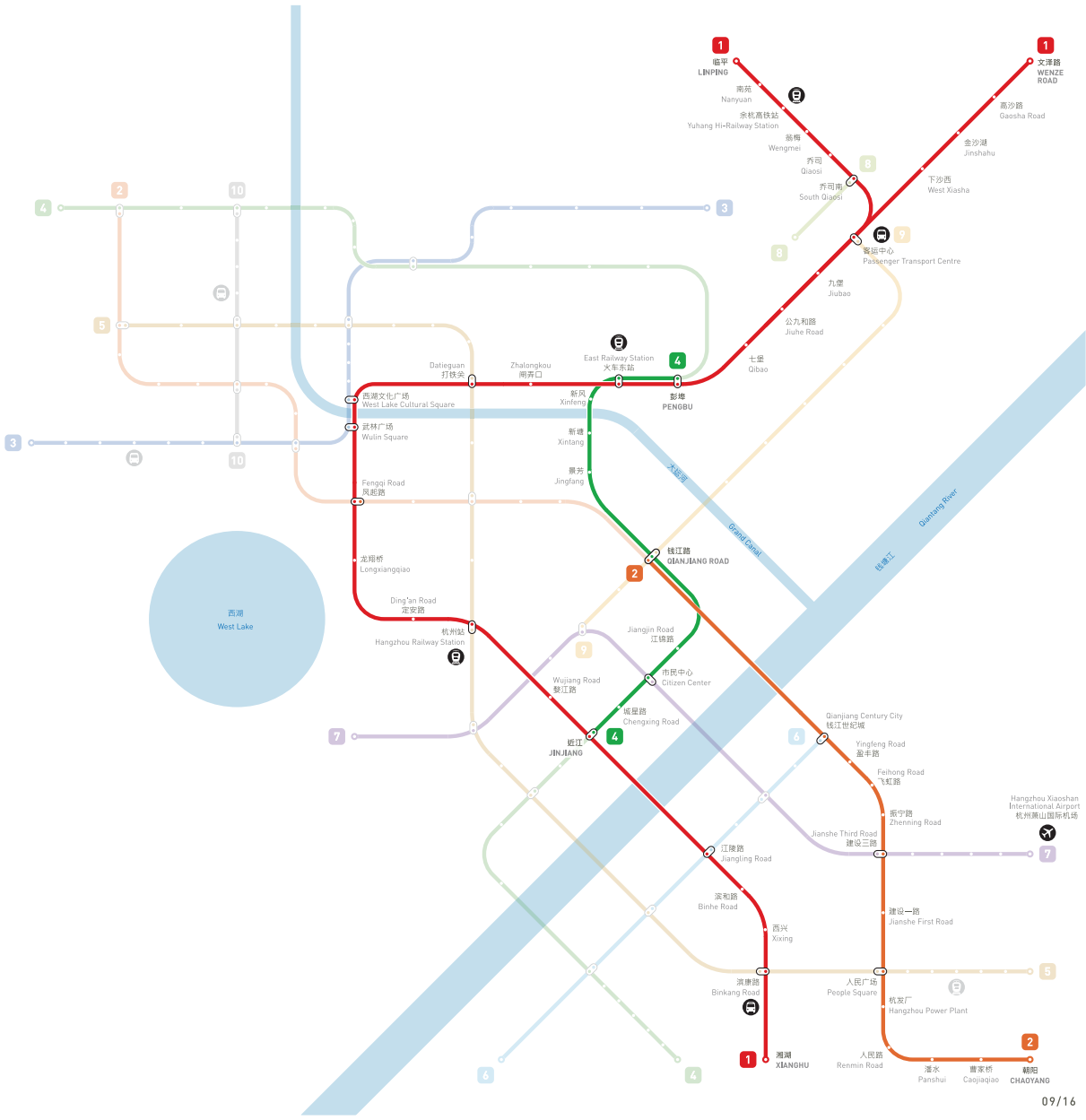


METRO NETWORK



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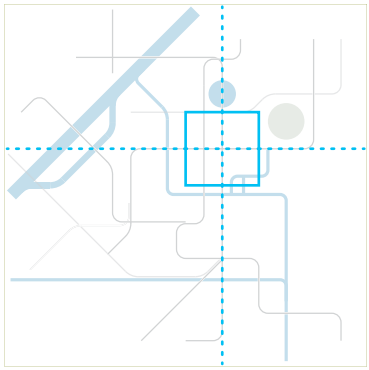
NANJING

THE SOUTHERN CAPITAL

Throughout history, China's seat of power has shifted between several great cities, the so-called four great capitals. Nanjing has been the choice of numerous emperors and eventually the capital of the republic. Nanjing literally means “Southern Capital”—“Nan” means south and “Jing” stands for capital.

The city rests between the Xuanwu Lake and the Qinhuai River, a tributary of the nearby Yangtze, and is dominated to the north-east by the Purple Mountain. Two metro lines (blue and green) run parallel through the historic area on a north-south course and intersect an east-west line (red) in its geographic center.



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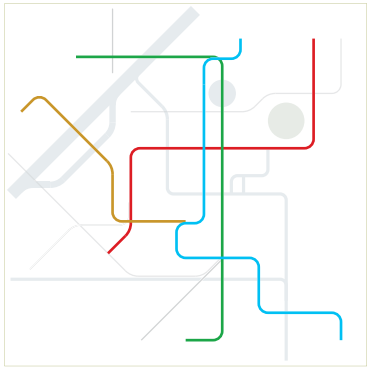

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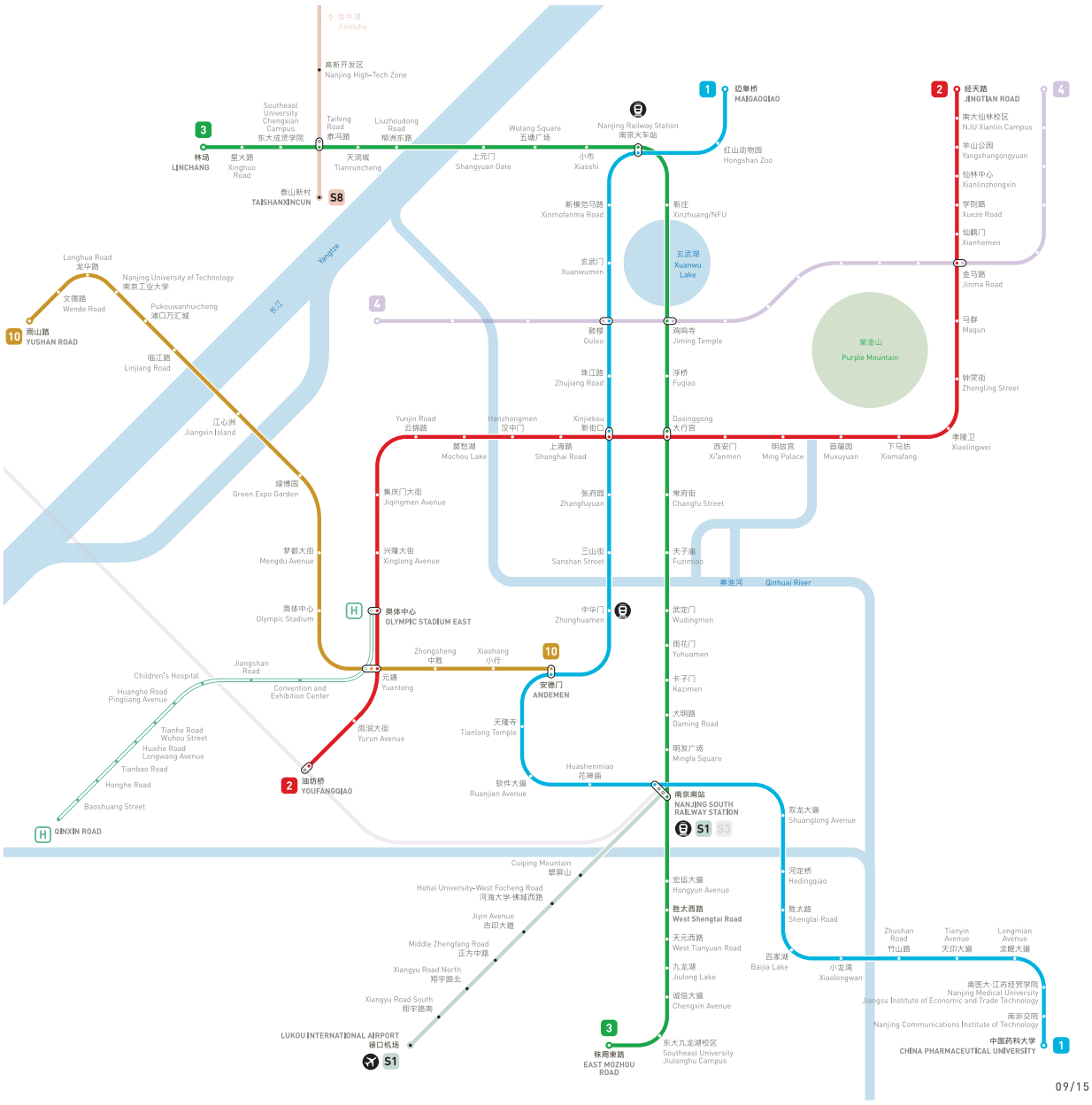

NANJING

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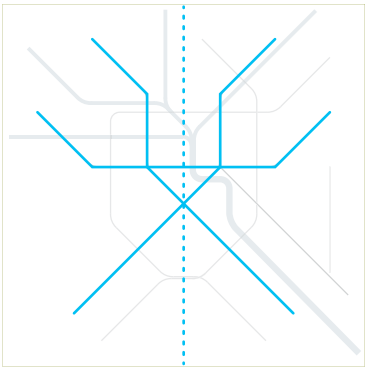
TIANJIN

THE MODEL NETWORK

Tianjin lies in a flat coastal plain and, despite a complex geography due to numerous waterways, its metro system is remarkably balanced and coherent.

The metro network is a textbook model. Three lines intersect each other in the center and form an isosceles triangle with symmetric branches on each side. Two projected lines further conform to this model and create an orbital ring offset from the central triangle.



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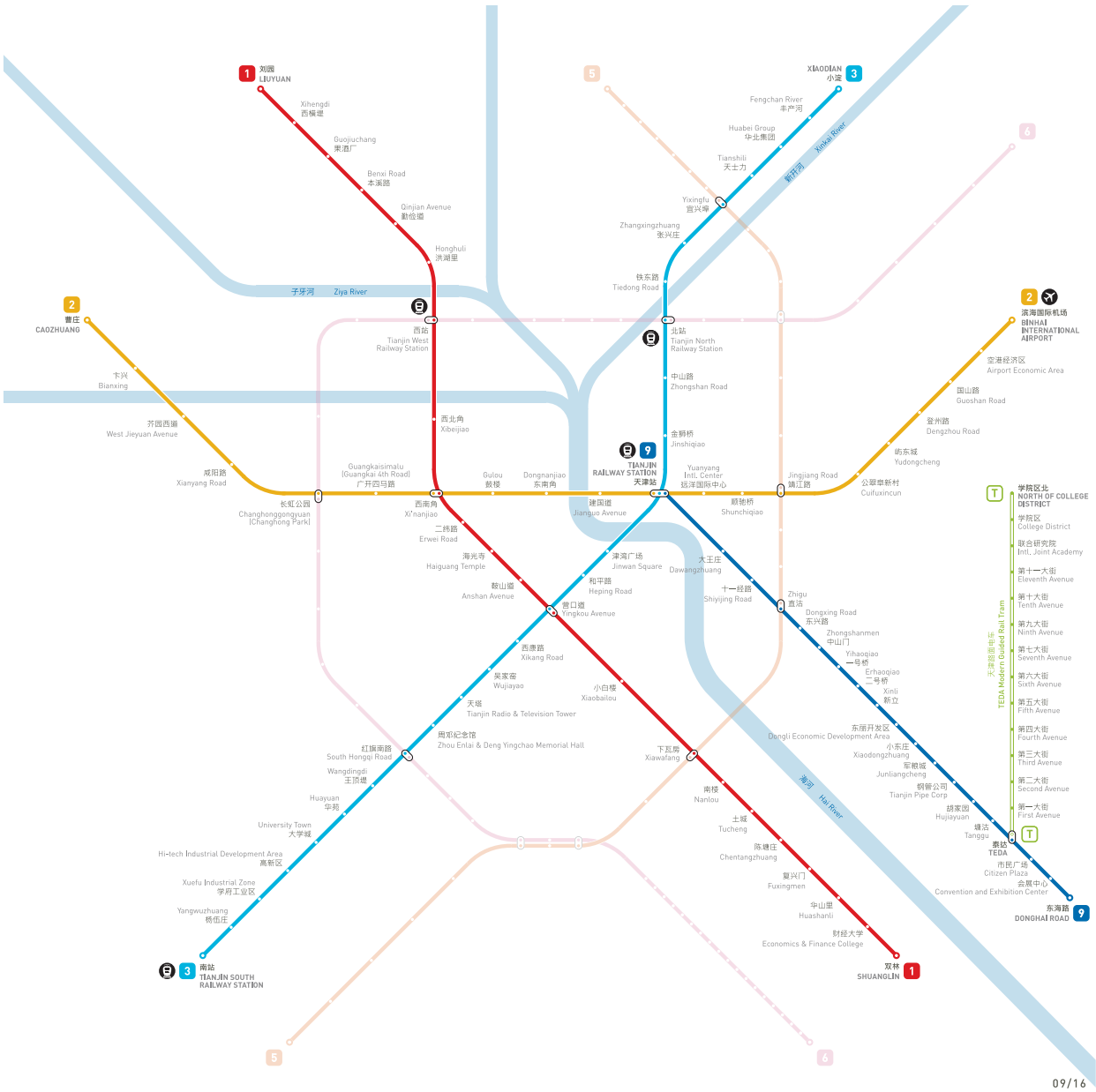
METRO NETWORK



TIANJIN

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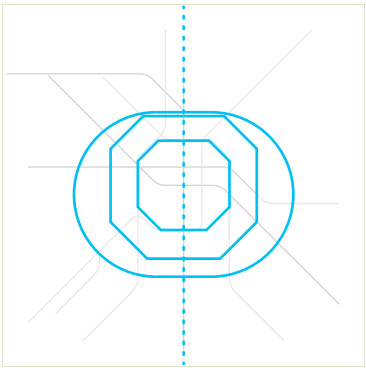
CHENGDU

THE COCOON

The Sichuan Basin is an enclave of fertile flatlands surrounded by mountains. During the reign of the first Chinese emperor, huge engineering works were conducted to take control of the raging waters flowing down from the Himalayas into the plain. This mastery of water coupled with fertile land has ensured the lasting prosperity of the region and of its main metropolis, Chengdu.

Just as the Sichuan Basin is a cocoon of comfort surrounded by mountain ridges, Chengdu is a cocoon surrounded by a domesticated landscape.

The transport network further emphasizes this perception of an enclave of comfort with two successive protective rings: an octagonal Bus Rapid Transit line (light green) and a metro loop line under construction (light blue).



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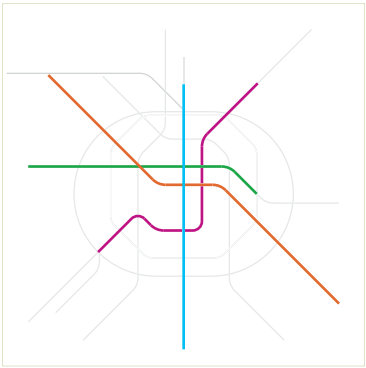
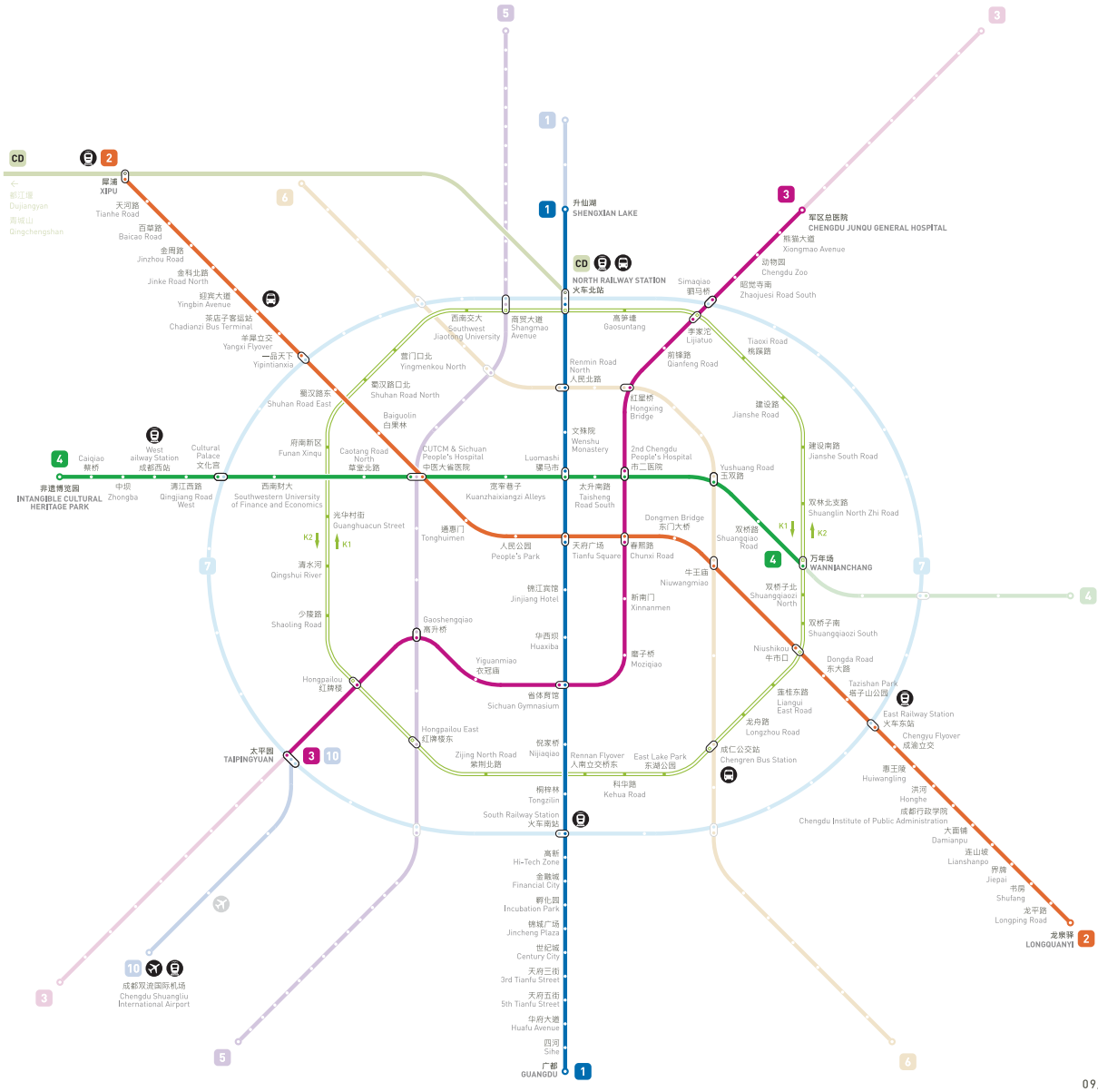


METRO NETWORK



09/16

CHENGDU

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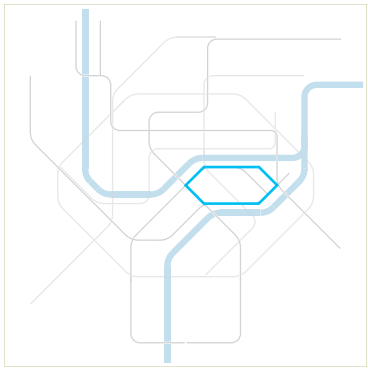
CHONGQING

THE ACROPOLIS AT THE CONFLUENCE

On the upper reaches of the Yangtze, at the confluence with the Jialing River, stands a mighty promontory overlooking the waters. Chongqing was built atop this ridge and its skyscrapers seem to emerge from the rock as a natural continuation. It is a dense, three-dimensional city; the steep slopes of the acropolis are emphasized by the verticality of the buildings.

Two metro lines (red and pink) and two monorail lines (green and blue) form the rail transit system with the red and green lines serving the whole length of the peninsula while the blue and pink lines provide connections across the rivers.



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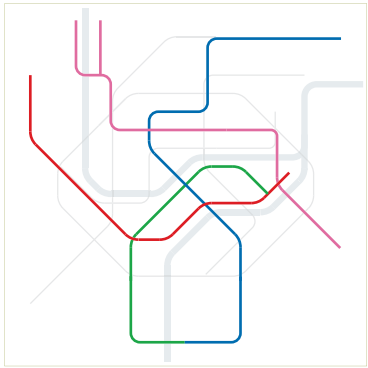
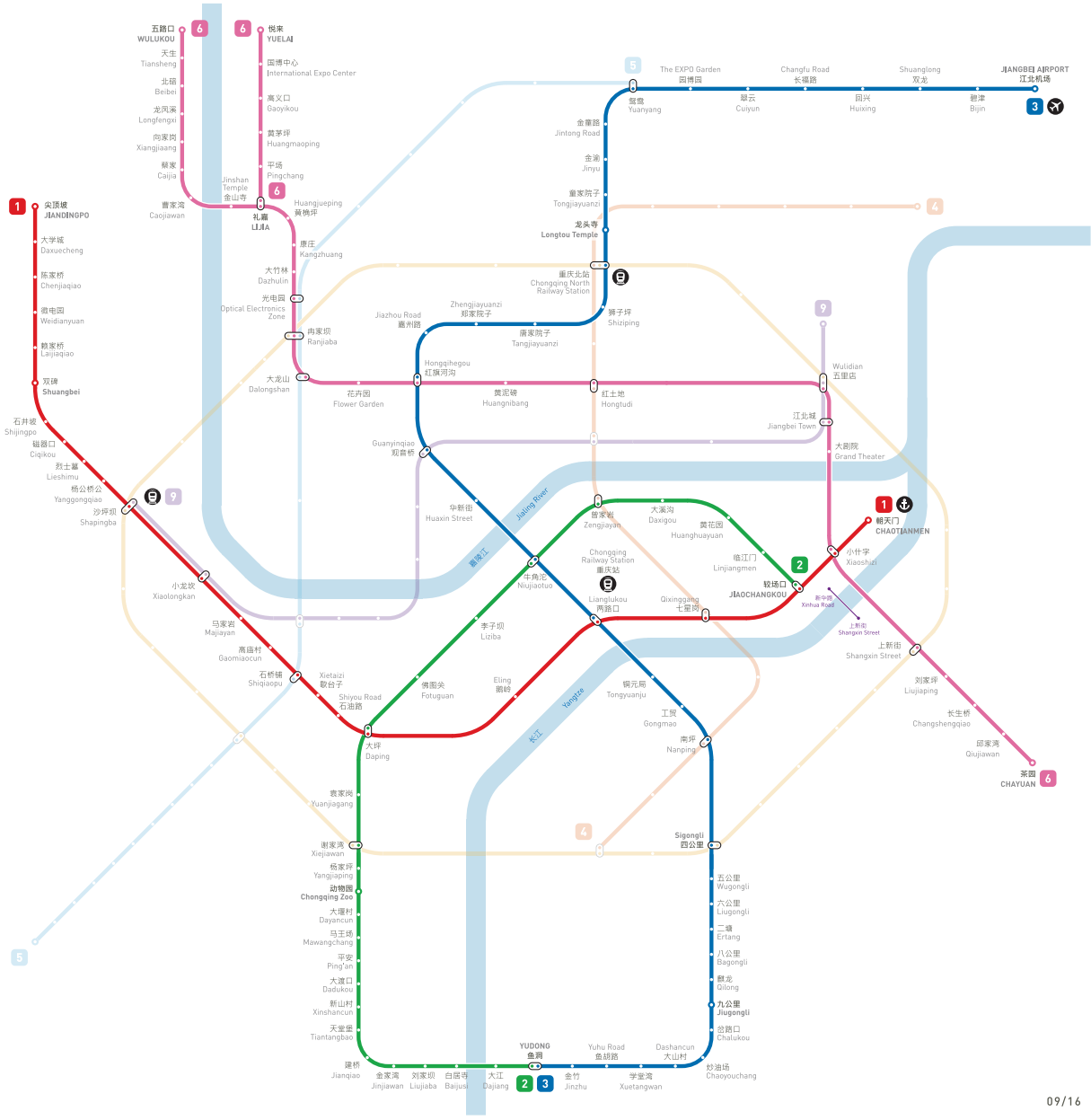


METRO NETWORK



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W U H A N

THREE CITIES UNDER ONE NAME

Before the first bridge over the Yangtze was built in the 1950s, the great river could be crossed only by boat and effectively separated the settlements on either side as well as the south of China from the north. At the confluence with the Han River, three separate cites grew independently, split by water from one another. To the north is Hankou, to the south Wuchang, and to the west Hanyang.

As the three cities eventually formed one large conurbation, a new name was coined to represent this new urban entity. “Wu” from Wuchang and “Han” from Hankou and Hanyang were merged into “Wuhan”, a testimony to the city’s origin.

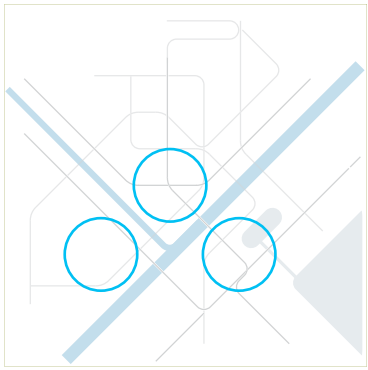
A similar narrative commands the metro network.

Line 1 (blue) is exclusive to Hankou and doesn't cross the water.

Line 2 (pink) links Hankou with Wuchang.

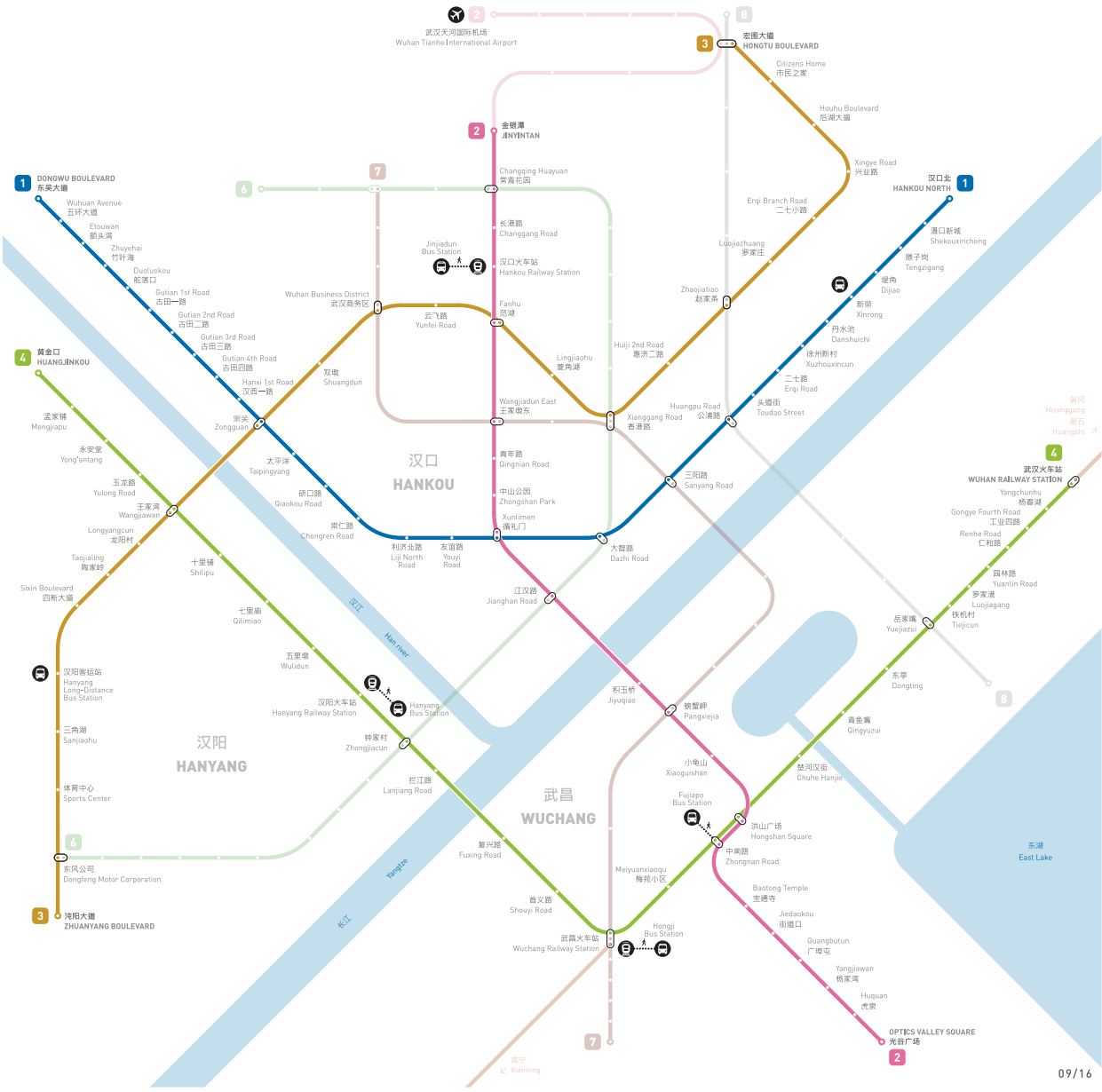
Line 3 (brown) connects Hanyang and Hankou.

Line 4 (green) closes the loop from Wuchang to Hanyang.



STRUCTURE

METRO NETWORK



WUHAN

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HONG KONG SHENZHEN

A METROPOLITAN SYMBIOSIS

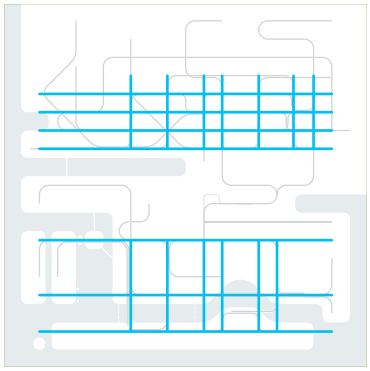
To the south is Hong Kong.

The former British territory has grown from a colonial outpost into a major port and international economic center. It continues to thrive under a special administrative status within China, preserving the particularities that have made it prosperous.

To the north is Shenzhen.

Today's bustling metropolis is the result of a successful experiment: the creation of a Special Economic Zone open to foreign investment intended to foster export-oriented manufacturing. Capital from neighboring Hong Kong combined with manpower from the hinterland resulted in an economic, demographic, and urbanization surge that ushered in a new era of economic development in China. The twin cities form a peculiar urban entity, serving one another without merging, linked while keeping a distance.

Similarly, their metro networks are connected but not integrated. Only two border connections allow transfers from one system to the other.



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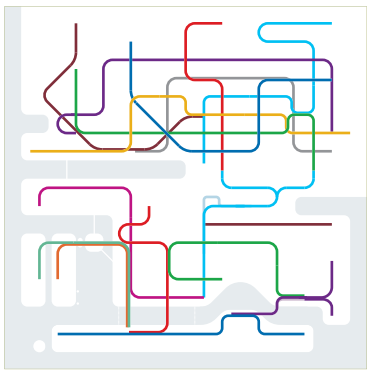
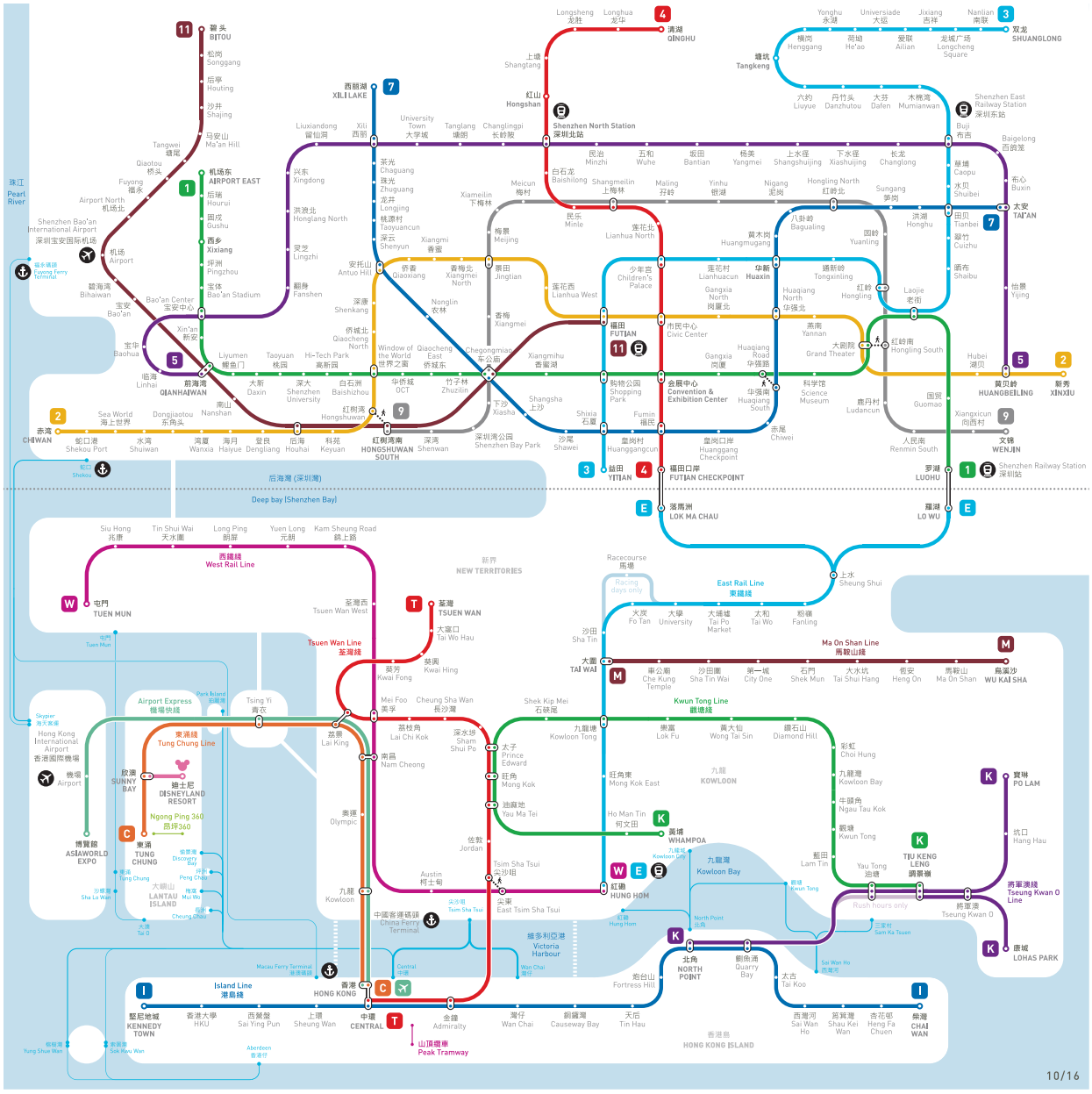


MTR-METRO NETWORK


HONG KONG SHENZHEN
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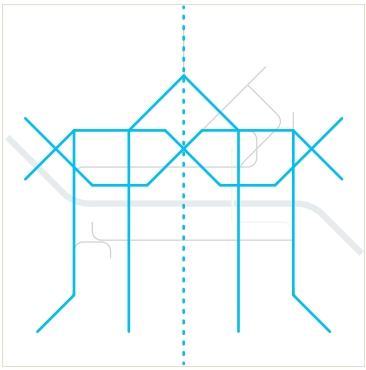
10/16

GUANGZHOU

CANTON, CHINA'S GATEWAY

Guangzhou has historically been the origin of the maritime trade routes connecting China to the rest of the world. From here, junks sailed all the way to India and Africa while Spanish galleons from Acapulco and Portuguese carracks brought silver in exchange for valuable silk garments and porcelain.

Today, it is the center of a megacity, a vast conurbation extending across the entire Pearl River Delta all the way to Hong Kong and Macau on the South China Sea. Four lines run from the south into the city center where they intermingle with two east-west lines (purple and magenta) to form a complex yet balanced web. The overall symmetric shape of the network is reminiscent of an elaborate vaulted gate resting on four pillars.



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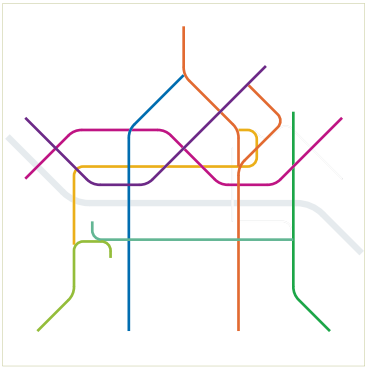
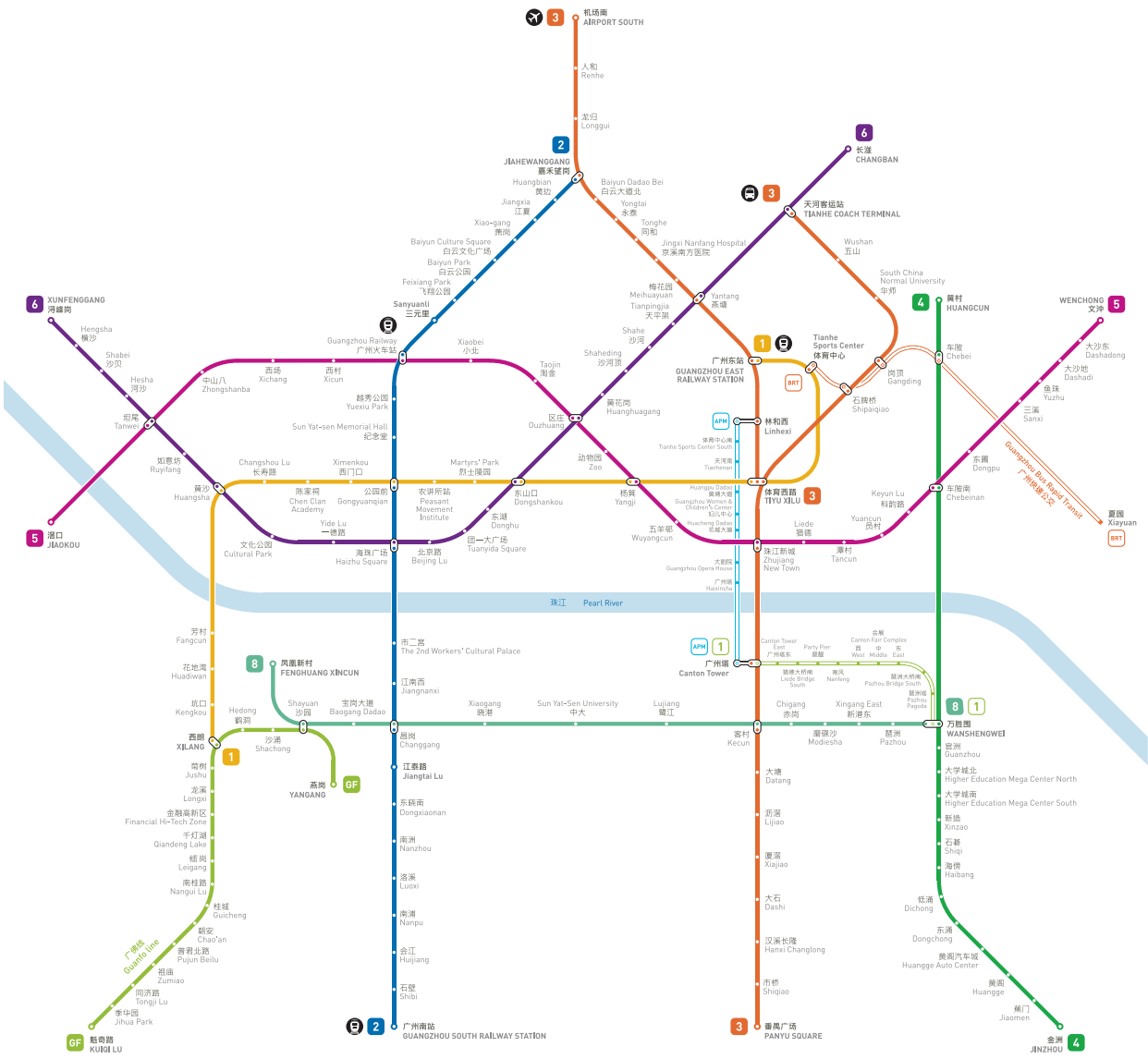


METRO NETWORK



09/16

GUANGZHOU

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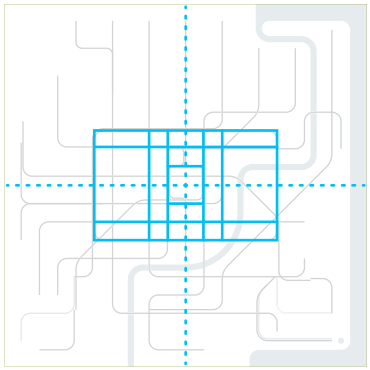
S H A N G H A I

I N S I D E A N D O U T

At first, a Chinese city lay on the western shore of a bend of the Huangpu River. A walled city separated the city from the countryside.

Then, European powers established concessions, extraterritorial enclaves along the Huangpu to the north, separating the Chinese city from the European one.

Finally, Shanghai grew to become a sprawling metropolis and a metro network was constructed with a ring line marking the city center. Inside the ring, lines intersect each other forming a dense and regular pattern of transfer stations. Outside the ring, lines mainly run isolated towards faraway suburbs.



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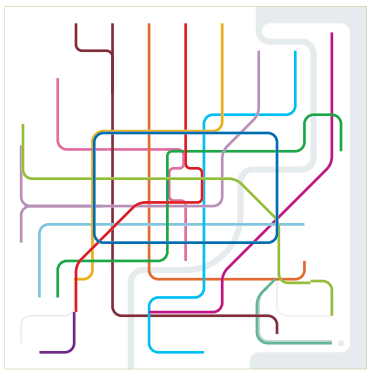
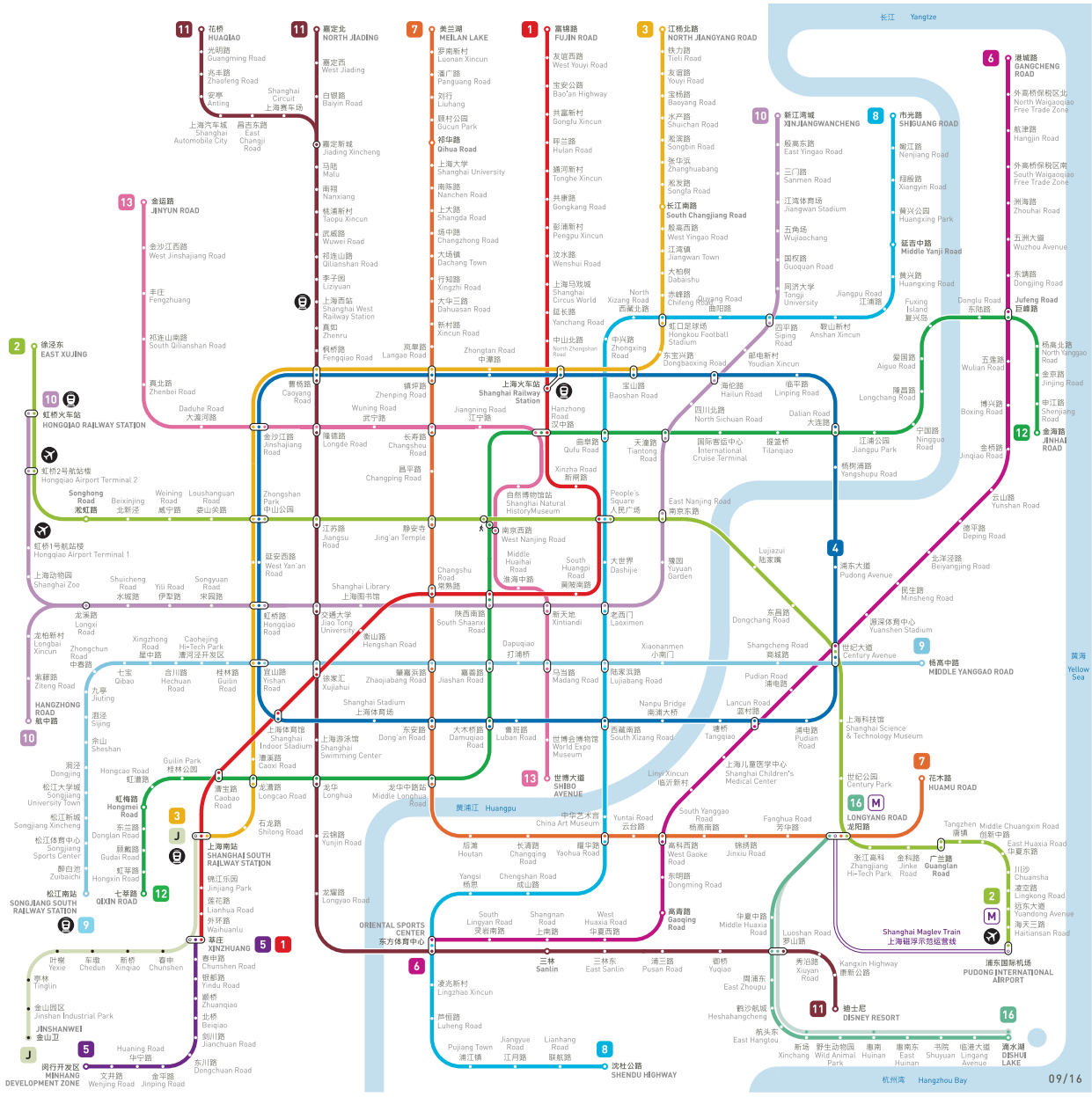


METRO NETWORK



SHANGHAI

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B E I J I N G

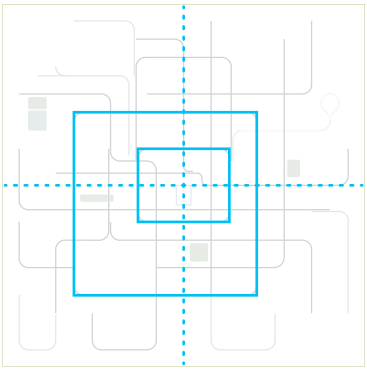
S Q U A R E D R I N G S

A succession of rings forms the urban structure of Beijing.

A vast palatial compound, known as The Forbidden Palace, stands in the center of the city surrounded by a rectangular moat.

Around the palace, the city historically occupied a rectangular space enclosed by walls. City walls were eventually demolished and replaced by a loop boulevard known as the second ring road. It is only the innermost of 4 more road rings whose construction has accompanied the growth of the metropolis.

Metro line 2 (blue) follows the second ring road and forms a rectangular loop around the historic center. A second loop line (light blue) runs mostly in the interstitial space between the 3rd and 4th rings and creates an outer orbital square. In this strictly orthogonal network, even the ring lines are square.



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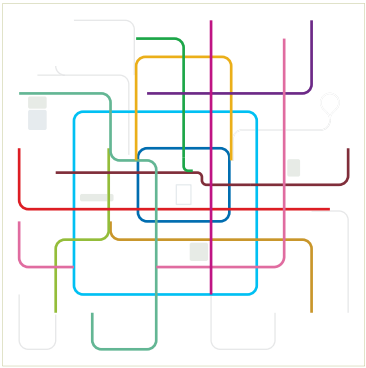
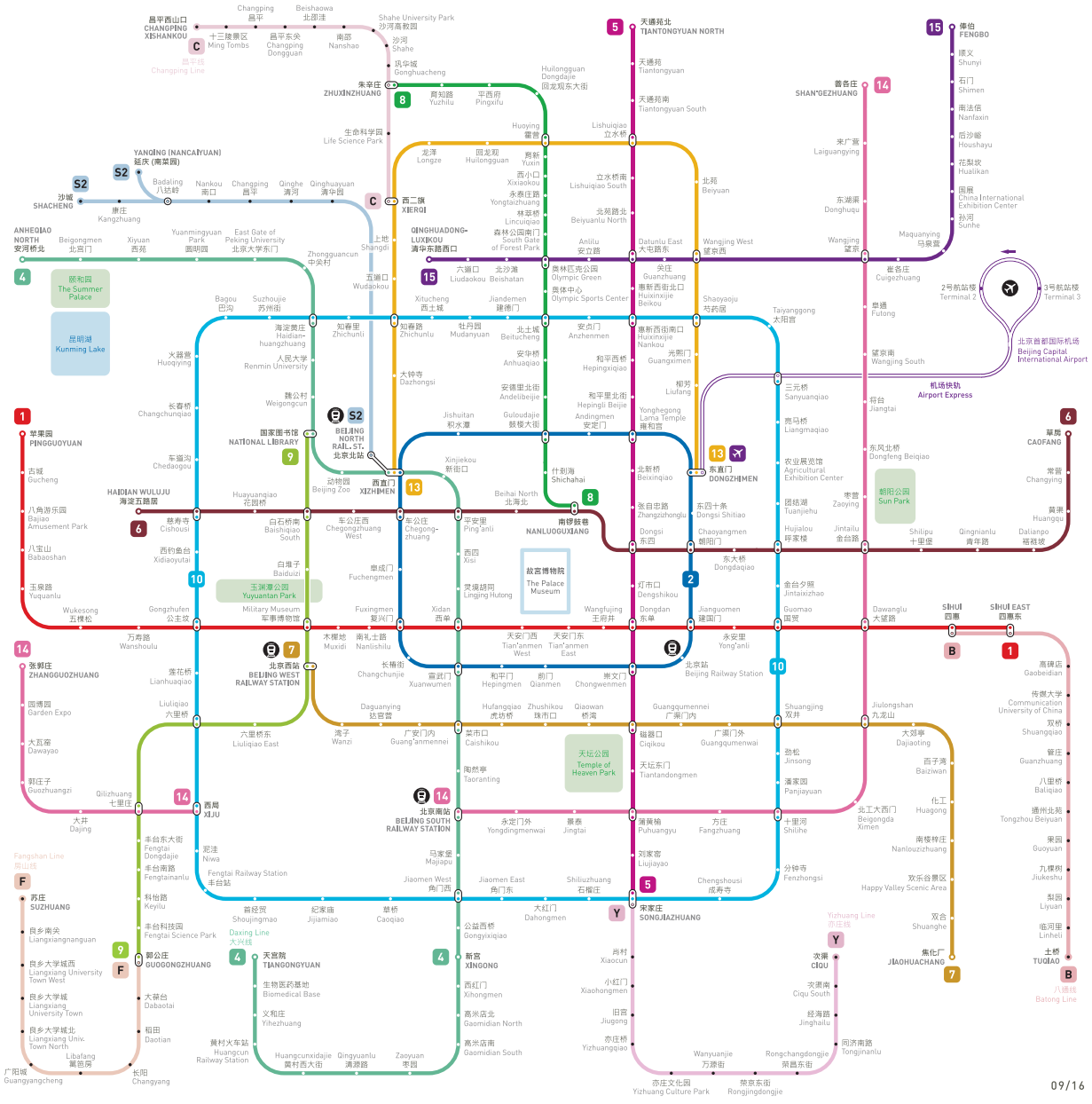


METRO NETWORK


昌平西山口 CHANGPING XISHANKOU
十三陵景区 Ming Tombs
昌平东关 Changping Dongguan
南部 Nanshao
昌平线 Changping Line
沙河 Shahe
沙河高教园 Shahe University Park
朱辛庄 ZHUXINZHUANG
生命科学园 Life Science Park
西二旗 XIERQI
龙泽 Longze
回龙观 Huilongguan
育新 Yuxin
西小口 Xixiaokou
永泰庄路 Yongtaizhuang
林萃桥 Lincuiqiao
森林公园南门 South Gate of Forest Park
清华东路西口 QINGHUADONG-LUXIKOU
上地 Shangdi
五道口 Wudaokou
六道口 Liudaokou
北沙滩 Beishatan
西土城 Xitucheng
建德门 Jiandemen
知春路 Zhichunlu
知春里 Zhichunli
牡丹园 Mudanyuan
北土城 Beitucheng
安贞门 Anzhenmen
安华桥 Anhuaqiao
安德里北街 Andelibeijie
和平里北街 Hepingli Beijie
安定门 Anding men
鼓楼大街 Guloudajie
积水潭 Jishuitan
大钟寺 Dazhongsi
北京北站 BEIJING NORTH RAIL. ST.
西直门 XIZHIMEN
新街口 Xinjiekou
北海北 Beihai North
什刹海 Shichahai
南锣鼓巷 NANLUOGUXIANG
故宫博物院 The Palace Museum
灵境胡同 Lingjing Hutong
西四 Xisi
平安里 Ping'anli
车公庄 Chegong-zhuang
车公庄西 Chegongzhuang West
白石桥南 Baishiqiao South
白堆子 Baiduizi
阜成门 Fuchengmen
复兴门 Fuxingmen
木樨地 Muxidi
南礼士路 Nanlishilu
长椿街 Changchunjie
宣武门 Xuanwumen
和平门 Hepingmen
前门 Qianmen
崇文门 Chongwenmen
天安门西 Tian'anmen West
天安门东 Tian'anmen East
王府井 Wangfujing
东单 Dongdan
建国门 Jianguomen
永安里 Yong'anli
北京站 Beijing Railway Station
北京西站 BEIJING WEST RAILWAY STATION
玉渊潭公园 Yuyuantan Park
军事博物馆 Military Museum
公主坟 Gongzhufen
五棵松 Wukesong
万寿路 Wanshoulu
国家图书馆 NATIONAL LIBRARY
动物园 Beijing Zoo
花园桥 Huayuanqiao
海淀五路居 HAIDIAN WULUJU
蔡寿寺 Cishousi
西钓鱼台 Xidiaoyutai
玉泉路 Yuquanlu
八宝山 Babaoshan
八角游乐园 Bajiao Amusement Park
车道沟 Chedaogou
古城 Gucheng
苹果园 PINGGUOYUAN
魏公村 Weigongcun
人民大学 Renmin University
海淀黄庄 Haidian-huangzhuang
火器营 Huoqiying
长春桥 Changchunqiao
巴沟 Bagou
苏州街 Suzhoujie
颐和园 The Summer Palace
昆明湖 Kunming Lake
安河桥北 ANHEQIAO NORTH
北宫门 Beigongmen
西苑 Xiyuan
圆明园 Yuanmingyuan Park
北京大学东门 East Gate of Peking University
中关村 Zhongguancun
沙河 SHACHENG
唐庄 Kangzhuang
巴陵路 Badaling
南口 Nankou
昌平 Changping
清河 Qinghe
清华园 Qinghuayuan
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天通苑 Tiantongyuan
天通苑南 Tiantongyuan South
立水桥 Lishuiqiao
立水桥南 Lishuiqiao South
北苑路北 Beiyuanlu North
北苑 Beiyuan
安立路 Anlilu
大屯路东 Datunlu East
望京西 Wangjing West
望京 Wangjing
望京南 Wangjing South
奥林匹克公园 Olympic Green
奥体中心 Olympic Sports Center
奥体西南门 Aoti Xinan Gate
奥体南门 Aoti Nanmen
奥体中心 Aoti Zhongxin
关庄 Guanzhuang
惠新西街北口 Huixinxijie Beikou
惠新西街南口 Huixinxijie Nankou
光熙门 Guangximen
柳芳 Liufang
和平西桥 Hepingxiqiao
北新桥 Beixinqiao
张自忠路 Zhangzhonglu
东四 Dongsi
朝阳门 Chaoyangmen
东直门 DONGZHIMEN
东四十条 Dongsi Shitiao
东大桥 Dongdaqiao
灯市口 Dengshikou
三元桥 Sanyuanqiao
亮马桥 Liangmaqiao
农业展览馆 Agricultural Exhibition Center
团结湖 Tuanjiehu
呼家楼 Hujialou
金台路 Jintailu
枣营 Zaoying
将台 Jiangtai
东风北桥 Dongfeng Beiqiao
朝阳公园 Sun Park
十里堡 Shilipu
青年路 Qingnianlu
燕莎 Yansha
三元桥 Sanyuanqiao
太阳宫 Taiyanggong
芍药居 Shaoyaoju
金台夕照 Jintaixizhao
国贸 Guomao
大望路 Dawanglu
SIHUI 四惠
SIHUI EAST 四惠东
高碑店 Gaobeidian
传媒大学 Communication University of China
双桥 Shuangqiao
管庄 Guanzhuang
八里桥 Baliqiao
通州北苑 Tongzhou Beiyuan
果园 Guoyuan
九棵树 Jiukeshu
梨园 Liyuan
临河里 Linheli
土桥 TUQIAO
八通线 Batong Line
常营 Changying
黄渠 Huangqu
草房 CAOFANG
崔各庄 Cuigezhuang
皇通 Futong
来广营 Laiguangying
东湖渠 Donghuqu
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孙河 Sunhe
国展 China International Exhibition Center
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后沙峪 Houshayu
南法信 Nanfaxin
石门 Shimen
顺义 Shunyi
俸伯 FENGBO
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3号航站楼 Terminal 3
北京首都国际机场 Beijing Capital International Airport
机场快轨 Airport Express
大望路 Dawanglu
金台路 Jintailu
呼家楼 Hujialou
团结湖 Tuanjiehu
永安里 Yong'anli
国贸 Guomao
双井 Shuangjing
劲松 Jinsong
潘家园 Panjiayuan
十里河 Shilihe
分钟寺 Fenzhongsi
成寿寺 Chengshousi
宋家庄 SONGJIAZHUANG
次渠 CIQU
次渠南 Ciqu South
经海路 Jinghailu
同济南路 Tongjinanlu
亦庄文化园 Yizhuang Culture Park
万源街 Wanyuanjie
荣京东街 Rongjingdongjie
荣昌东街 Rongchangdongjie
亦庄线 Yizhuang Line
大兴线 Daxing Line
房山线 Fangshan Line
张郭庄 ZHANGGUOZHUANG
园博园 Garden Expo
大瓦窑 Dawayao
郭庄子 Guozhuangzi
七里庄 Qilizhuang
大井 Dajing
丰台东大街 Fengtai Dongdajie
丰台南路 Fengtainanlu
丰台科技园 Fengtai Science Park
科怡路 Keyilu
丰台火车站 Fengtai Railway Station
泥洼 Niwa
西局 XIJU
六里桥 Liuliqiao
六里桥东 Liuliqiao East
莲花桥 Lianhuaqiao
北京南站 BEIJING SOUTH RAILWAY STATION
马家堡 Majiabu
角门西 Jiaomen West
角门东 Jiaomen East
永定门外 Yongdingmenwai
景泰 Jingtai
大红门 Dahongmen
石榴庄 Shiliuzhuang
南苑 Nanyuan
公益西桥 Gongyixiqiao
新宫 XINGONG
西红门 Xihongmen
高米店北 Gaomidian North
高米店南 Gaomidian South
天宫院 TIANGONGYUAN
生物医药基地 Biomedical Base
义和庄 Yihezhuang
黄村火车站 Huangcun Railway Station
黄村西大街 Huangcunxidajie
清源路 Qingyuanlu
枣园 Zaoyuan
草桥 Caoqiao
纪家庙 Jijiamiao
首经贸 Shoujingmao
苏庄 SUZHUANG
良乡南关 Liangxiangnanguan
良乡大学城西 Liangxiang University Town West
良乡大学城 Liangxiang University Town
良乡大学城北 Liangxiang Univ. Town North
大葆台 Dabaotai
稻田 Daotian
长阳 Changyang
广阳城 Guangyangcheng
篱笆房 Libafang
郭公庄 GUOGONGZHUANG
良乡南关 Liangxiangnanguan
天坛公园 Temple of Heaven Park
菜市口 Caishikou
陶然亭 Taoranting
虎坊桥 Hufangqiao
珠市口 Zhushikou
桥湾 Qiaowan
广安门内 Guang'anmennei
广安门外 Guang'anmenwai
鸿子 Wanzi
大葆台 Dabaotai
大钟寺 Dazhongsi
知春路 Zhichunlu
西直门 XIZHIMEN
东直门 DONGZHIMEN
北京南站 BEIJING SOUTH RAILWAY STATION
北京西站 BEIJING WEST RAILWAY STATION
天坛公园 Temple of Heaven Park
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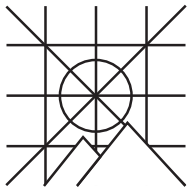


COMPOSITE

Sometimes. History, geography, and symbolism conspire to create seemingly untamable and almost frighteningly complex composite networks, mosaics of intermingled shapes and principles. It is then the duty of the mapmaker to disentangle the complexity, understand the underlying logic of the system, and convey it in the map through neat forms and a balanced, welcoming layout.

MADRID

THE BAROQUE TROMPE L'ŒIL

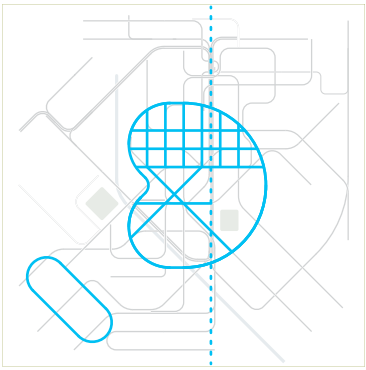
A profusion of forms, perspectives, and illusions, Madrid's transit network is a personification of the baroque.

In the historic center, around Sol, four lines form a radial network with each line successively intersecting the others to form a triangular pattern of transfer stations. Yet, immediately to the north and east, lines run on horizontal or vertical routes and form an orthogonal grid. This area corresponds to the 19th century expansion of the city where wide streets run parallel or perpendicular to each other.

A loop line (grey) surrounds this orthogonal grid but only its northern part is an orbital providing tangential connections. By contrast, the southern part is more akin to a regular line serving the suburbs: an illusion of function.

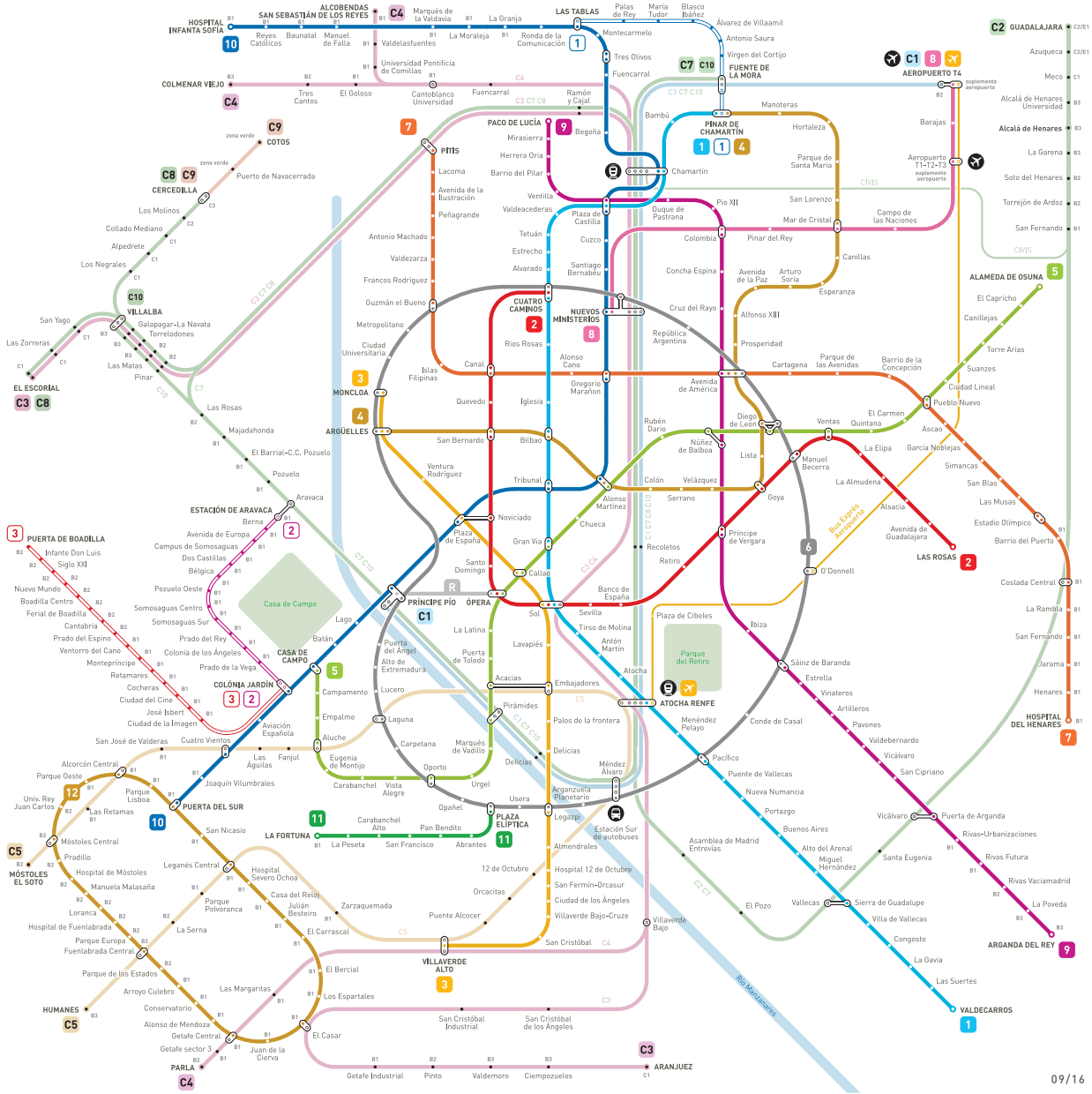
Further southwest lies a second loop (light brown) which is not an orbital at all, but a local line connecting five peripheral towns.

As a final surprise, the backbone of the system is not at all the metro. The main transport artery is actually the commuter rail corridor from Atocha to Chamartín running straight from south to north under Castellana Avenue.



STRUCTURE

METRO NETWORK



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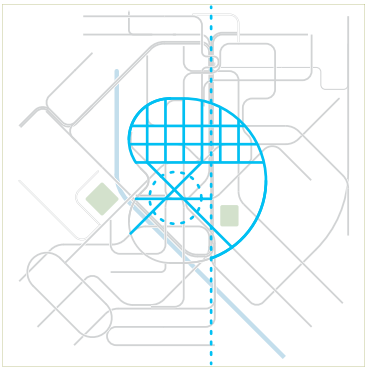
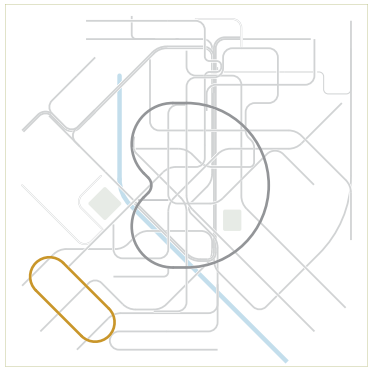


CITYSCAPE



LOOP LINES

RADIAL

COMMUTER RAIL VIA RECOLETOS

ORTHOGONAL

COMMUTER RAIL VIA SOL

CITYSCAPE

The historic city is located north of the Manzanares River, between Casa de Campo and Retiro park.

Its expansion to the north and east follows a regular orthogonal street grid.

The main axis of the city is the north-south Castellana Avenue (dotted line).

RADIAL

4 lines converge towards the historic center and form a radial network focused on Sol, Callao and Ópera.

ORTHOGONAL

4 lines serve the area north and east of the historic center and conform to its orthogonal street layout.

LOOP LINES

Line 6 (grey) is an orbital in its northern half where it marks the limit of the historic center's orthogonal expansion.

Its southern half serves peripheral neighborhoods.

Line 12 (light brown) is a local service connecting 5 suburban towns. It has only one connecting point with the rest of the metro system, but many more with the commuter lines.

COMMUTER RAIL VIA RECOLETOS

Cercanías commuter rail lines C1, C7, C8 and C10 run straight under Castellana Avenue, crossing the city on a north-south axis.

They connect Atocha and Chamartín rail terminals via Recoletos.

C1 line (light blue) is an airport link from Príncipe Pío to Barajas Airport.

COMMUTER RAIL VIA SOL

Cercanías lines C3 and C4 (magenta) connect Atocha and Chamartín rail terminals via Sol.

Line C5 (yellow) serves the southern suburbs from Atocha.

BERLIN

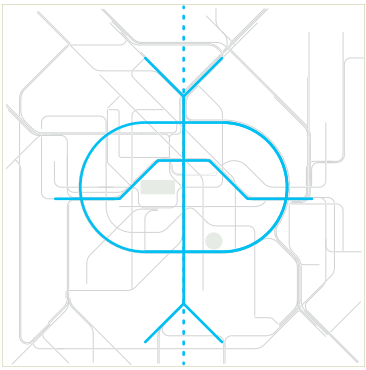
OVERLAPPING SCALES

Three rail systems overlap in Berlin, each one functioning on a different territorial scale. The U-Bahn is the urban scale metro, the S-Bahn the metropolitan scale commuter rail, while the Regional-Express (RE) and the Regionalbahn (RB) are the regional scale links.

The S-Bahn is the backbone of the system and its structure is made of three corridors defining Berlin's urban layout. The Ringbahn loop line encircles the city center. The Stadtbahn crosses it from east to west and the Nord-Süd Tunnel from north to south. Its lines serve the peripheral areas beyond the reach of the U-Bahn.

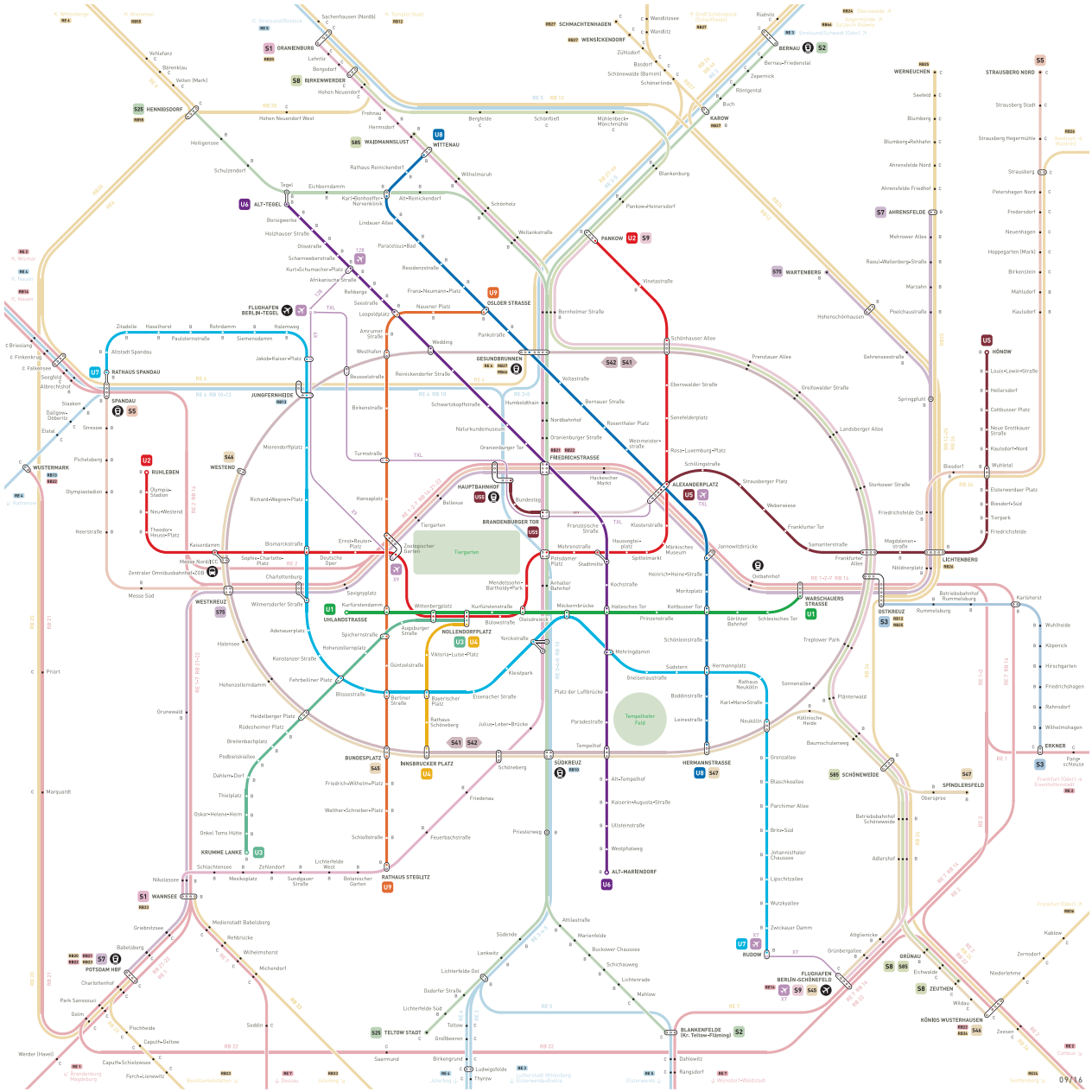
U-Bahn lines form a dense urban network inside the ring and radiate beyond it as single isolated routes.

Regionalbahn lines operate on cross-town routes, much like the S-Bahn, but they skip metropolitan stations served by the S-Bahn and stop only at regional stations at the edge of its reach or beyond. The exceptions are a handful of central hubs, such as Alexanderplatz and Hauptbahnhof—the joints of the entire system—where all three networks are connected.



STRUCTURE

U-BAHN NETWORK



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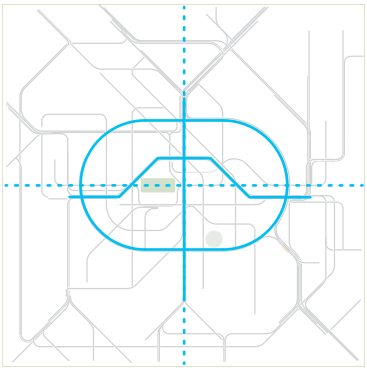
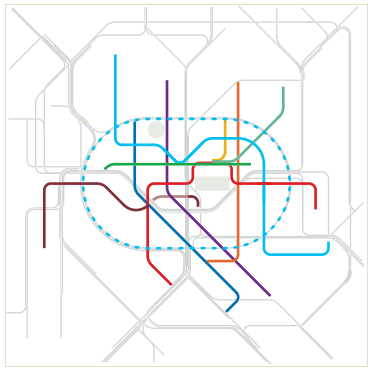
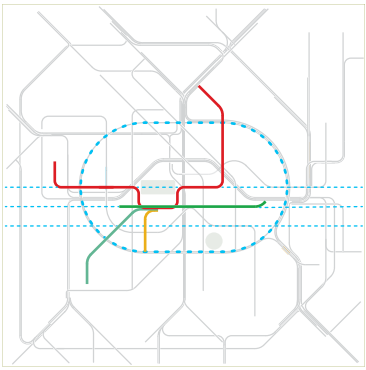


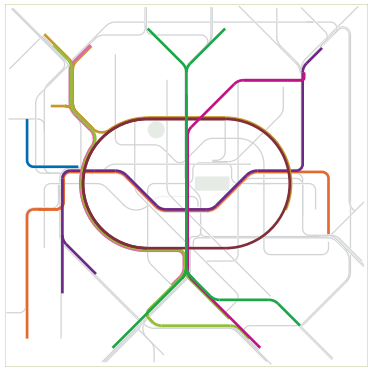
CITYSCAPE



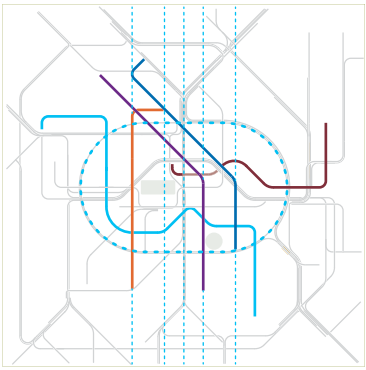
URBAN SCALE



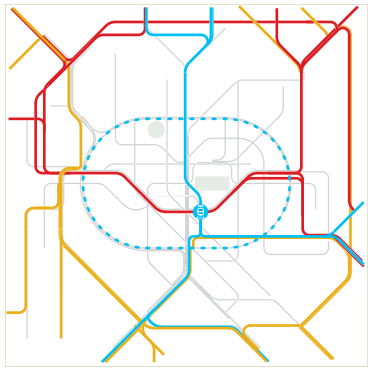
SMALL PROFILE U-BAHN



METROPOLITAN SCALE



LARGE PROFILE U-BAHN



REGIONAL SCALE

CITYSCAPE

The S-Bahn network provides the organizing structure of the system.

The Ringbahn stadium-shaped loop line.

The Stadtbahn corridor on an east-west axis.

The Nord-Süd Tunnel on a north-south axis.

SMALL PROFILE U-BAHN

U1, U2, U3 and U4 together form the original U-Bahn network, built for small profile trains on a primarily east-west direction. All lines connect at Nollendorfplatz and can be switched at will from one route to another.

LARGE PROFILE U-BAHN

Later extensions to the network were built for large profile trains.

U6 (purple), U8 (blue), and U9 (orange) run on a mostly north-south course.

U5 (brown) runs east-west and U7 (light blue) runs both north-south and east-west.

URBAN SCALE

U-Bahn lines serve the inner urban area, primarily inside the Ringbahn.

METROPOLITAN SCALE

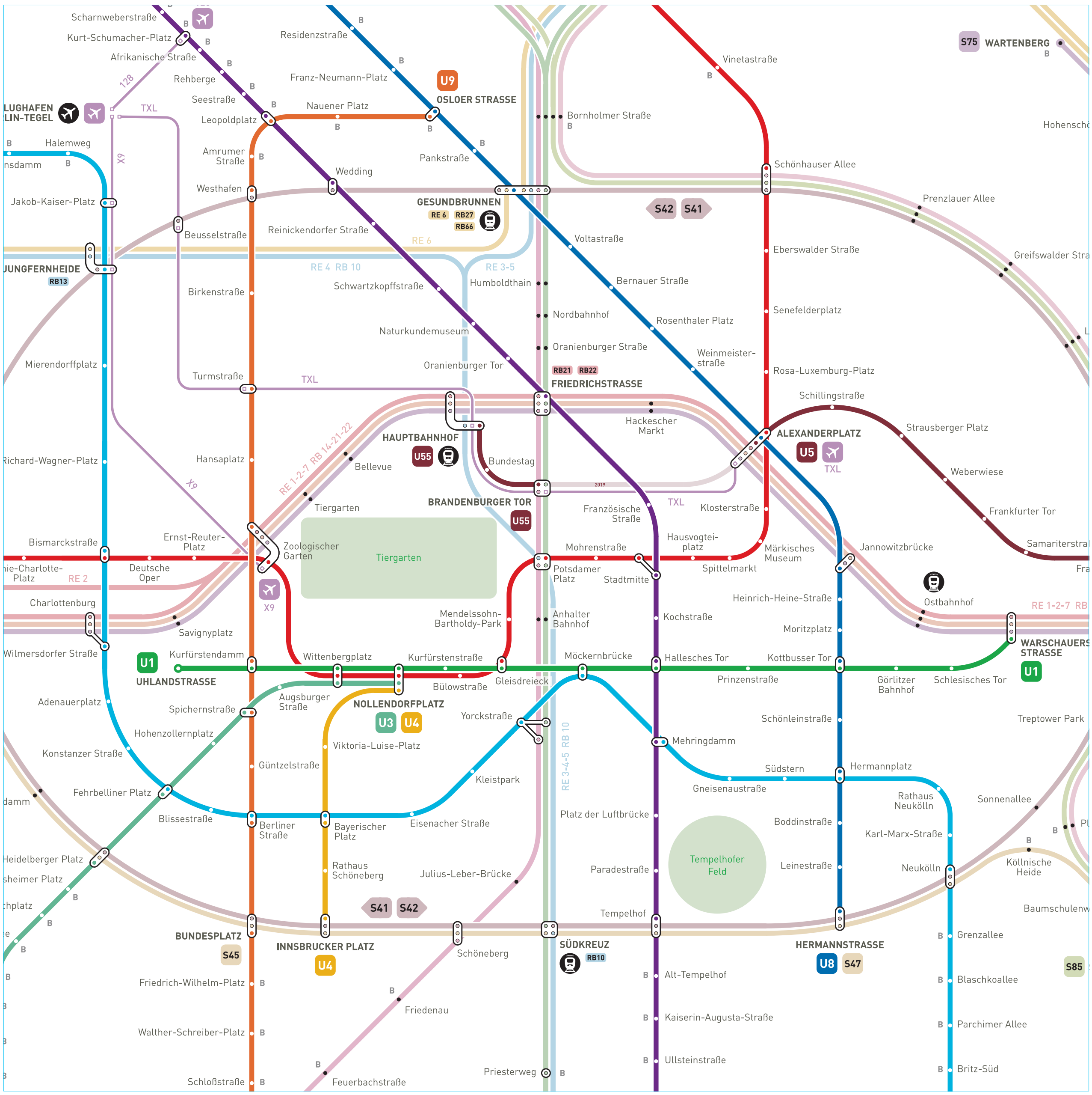
S-Bahn lines serve the entire metropolitan area. They use 3 shared corridors in the center then branch out into individual lines. Stations at corridor intersections are major transfer hubs.

REGIONAL SCALE

Regionalbahn and Regional-Express lines serve the wider region around the metropolis. They skip most stations in the central area that are otherwise served by the S-Bahn.

These lines also provide orbital connections in the outer suburbs.

Regional corridors (red and light blue) intersect at Hauptbahnhof, the main railway station.



Scharnweberstraße
Kurt-Schumacher-Platz
Afrikanische Straße
Rehberge
Seestraße
Leopoldplatz
Residenzstraße
Franz-Neumann-Platz
U9
OSLOER STRASSE
Nauener Platz
Vinetastraße
S75 WARTENBERG
Bornholmer Straße
Hohenschö
LUGHAFEN
LIN-TEGEL
TXL
128
X9
Halemweg
nsdamm
Amrumer Straße
Wedding
Pankstraße
Schönhauser Allee
Jakob-Kaiser-Platz
Westhafen
GESUNDBRUNNEN
RE 6
RB27
RB66
S42
S41
Prenzlauer Allee
Beusselstraße
Reinickendorfer Straße
Voltastraße
Eberswalder Straße
Greifswalder Stra
JUNGFERNHEIDE
RB13
RE 4
RB 10
RE 3-5
Humboldthain
Birkenstraße
Schwartzkopffstraße
Bernauer Straße
Senefelderplatz
Nordbahnhof
Rosenthaler Platz
Naturkundemuseum
Mierendorffplatz
Oranienburger Straße
Weinmeister-straße
Turmstraße
Oranienburger Tor
Rosa-Luxemburg-Platz
RB21
RB22
FRIEDRICHSTRASSE
Schillingstraße
Hackescher Markt
HAUPTBAHNHOF
ALEXANDERPLATZ
Strausberger Platz
Richard-Wagner-Platz
Hansaplatz
U55
U5
Bundestag
RE 1-2-7 RB 14-21-22
Bellevue
Weberwiese
2019
Tiergarten
BRANDENBURGER TOR
TXL
Französische Straße
Klosterstraße
Frankfurter Tor
Bismarckstraße
Ernst-Reuter-Platz
Zoologischer Garten
Tiergarten
Mohrenstraße
Hausvogtei-platz
Märkisches Museum
Jannowitzbrücke
Samariterstra
ie-Charlotte-Platz
Deutsche Oper
RE 2
Potsdamer Platz
Stadtmitte
Spittelmarkt
Fra
X9
Heinrich-Heine-Straße
Ostbahnhof
RE 1-2-7 RB
Charlottenburg
Mendelssohn-Bartholdy-Park
Anhalter Bahnhof
Kochstraße
Savignyplatz
Moritzplatz
WARSCHAUERS STRASSE
Wilmersdorfer Straße
U1
Kurfürstendamm
Wittenbergplatz
Kurfürstenstraße
Möckernbrücke
Hallesches Tor
Kottbusser Tor
UHLANDSTRASSE
Bülowstraße
Gleisdreieck
Prinzenstraße
Görlitzer Bahnhof
Schlesisches Tor
U1
Adenauerplatz
Augsburger Straße
NOLLENDORFPLATZ
Spichernstraße
U3
U4
Yorckstraße
Schönleinstraße
Treptower Park
Hohenzollernplatz
Viktoria-Luise-Platz
Mehringdamm
Konstanzer Straße
RE 3-4-5 RB 10
Südstern
Hermannplatz
Güntzelstraße
Kleistpark
Gneisenaustraße
Rathaus Neukölln
Sonnenallee
damm
Fehrbelliner Platz
Blissestraße
Berliner Straße
Bayerischer Platz
Eisenacher Straße
Platz der Luftbrücke
Boddinstraße
Karl-Marx-Straße
Pl
Tempelhofer Feld
Heidelberger Platz
Rathaus Schöneberg
Julius-Leber-Brücke
Paradestraße
Leinestraße
Neukölln
Köllnische Heide
sheimer Platz
hplatz
S41
S42
Tempelhof
Baumschulenw
BUNDESPLATZ
S45
INNSBRUCKER PLATZ
U4
Schöneberg
SÜDKREUZ
RB10
HERMANNSTRASSE
U8
S47
Grenzallee
S85
Friedrich-Wilhelm-Platz
Alt-Tempelhof
Blaschkoallee
Friedenau
Walther-Schreiber-Platz
Kaiserin-Augusta-Straße
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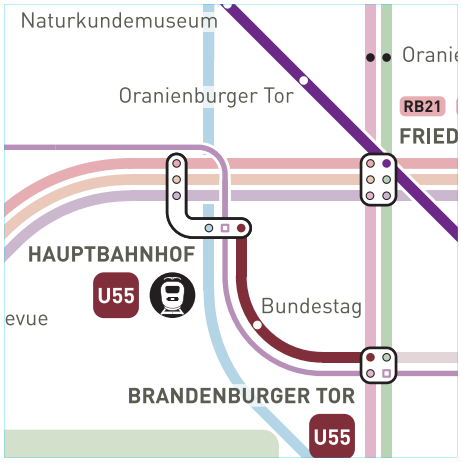
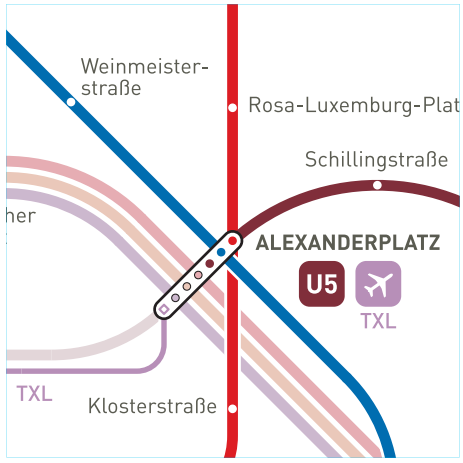
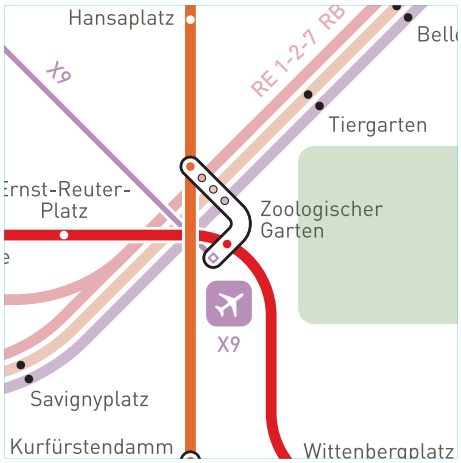
Ullsteinstraße
Priesterweg
Britz-Süd
Schloßstraße
Feuerbachstraße



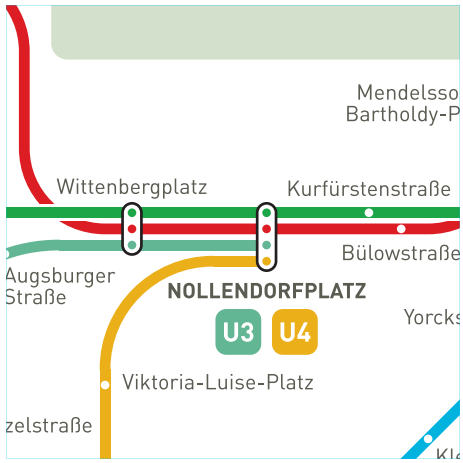
HAUPTBAHNHOF



ALEXANDERPLATZ



ZOOLOGISCHER GARTEN



NOLLENDORFPLATZ

SEOUL

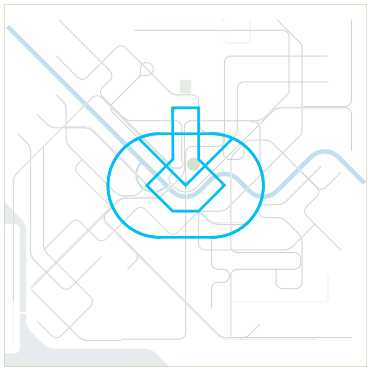
ONE MOUNTAIN, ONE RIVER

The Han River and Namsan Mountain are the dominant landscape elements defining Seoul.

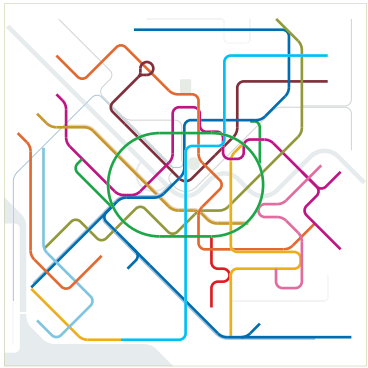
The historic city center is located just north of Namsan. As the city expanded and eventually occupied the entire valley, the mountain was surrounded by an urban fabric and became a referential point for the entire city. It lies in the very center, where the Han River bends and hugs its steep slopes.

After filling up the Han River valley, Seoul expanded towards the adjacent valleys, between the mountains, and eventually merged with the surrounding cities, Bucheon, Incheon, and Suwon, forming a giant conurbation.

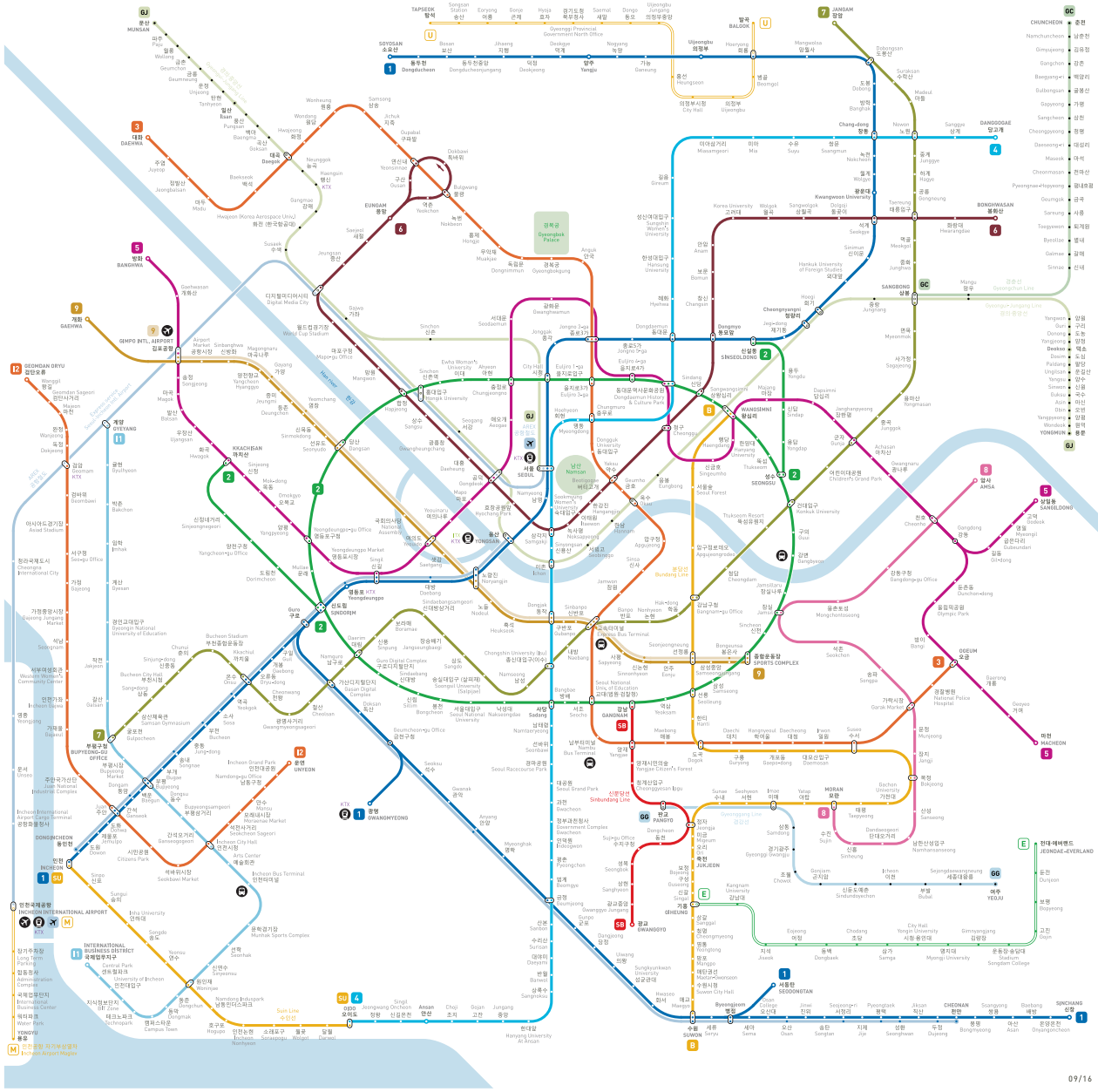
The metro network bears witness to this evolution. Inside the loop line that connects neighborhoods along the valley, lines run parallel to the river or perpendicular to it around Namsan Mountain. They reach out to the neighboring cities and all the way to the sea shore, creating a regional scale network.



STRUCTURE



SUBWAY NETWORK



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SEOUL

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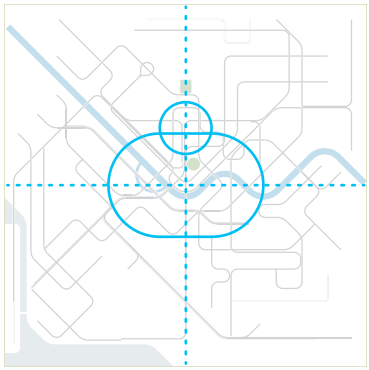
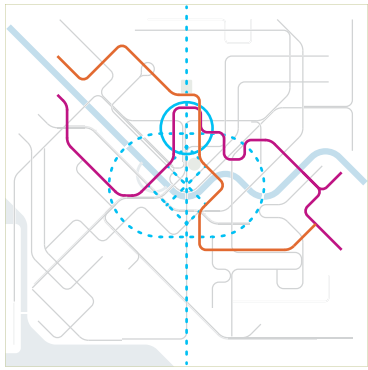
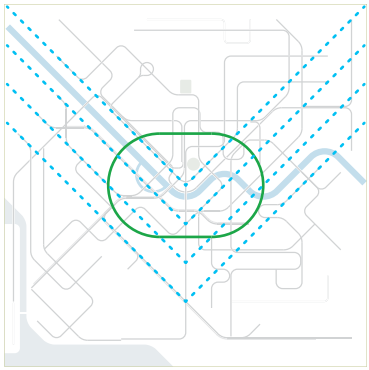


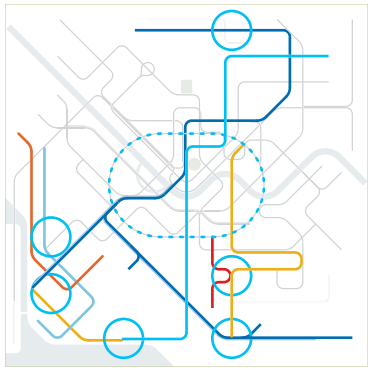
CITYSCAPE



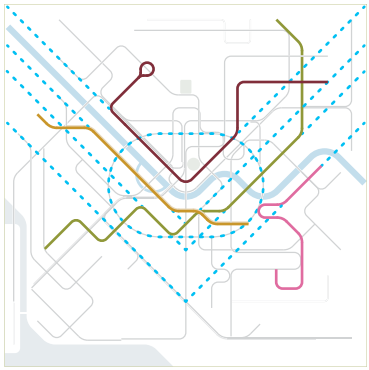
CITY CENTER LINES



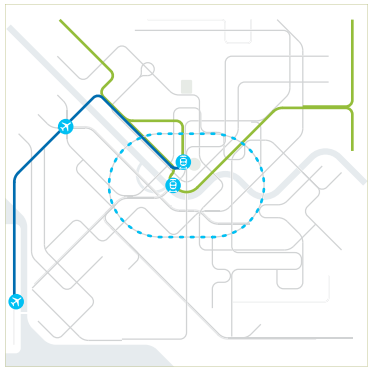
HAN RIVER VALLEY



METROPOLITAN LINES



VALLEY LINES



COMMUTER RAIL LINES

CITYSCAPE

Namsan Mountain dominates the Han River on its northern shore. It is the symbolic center and focal point of the city as the tower on its top can be seen from faraway locations.

The city center (circle) is north of Namsan, between the mountain and Gyeongbok Palace.

HAN RIVER VALLEY

Line 2 (green) is a loop connecting all neighborhoods along the valley. It is in no way a border or boundary—mountains around the valley serve this purpose—but a vital link holding the city together.

VALLEY LINES

4 lines follow the course of the river and run mostly parallel to it.

Line 9 (light brown) operates skip-stop express services.

CITY CENTER LINES

2 lines run around Namsan Mountain and serve the city center with cross-river connections to the southern bank.

METROPOLITAN LINES

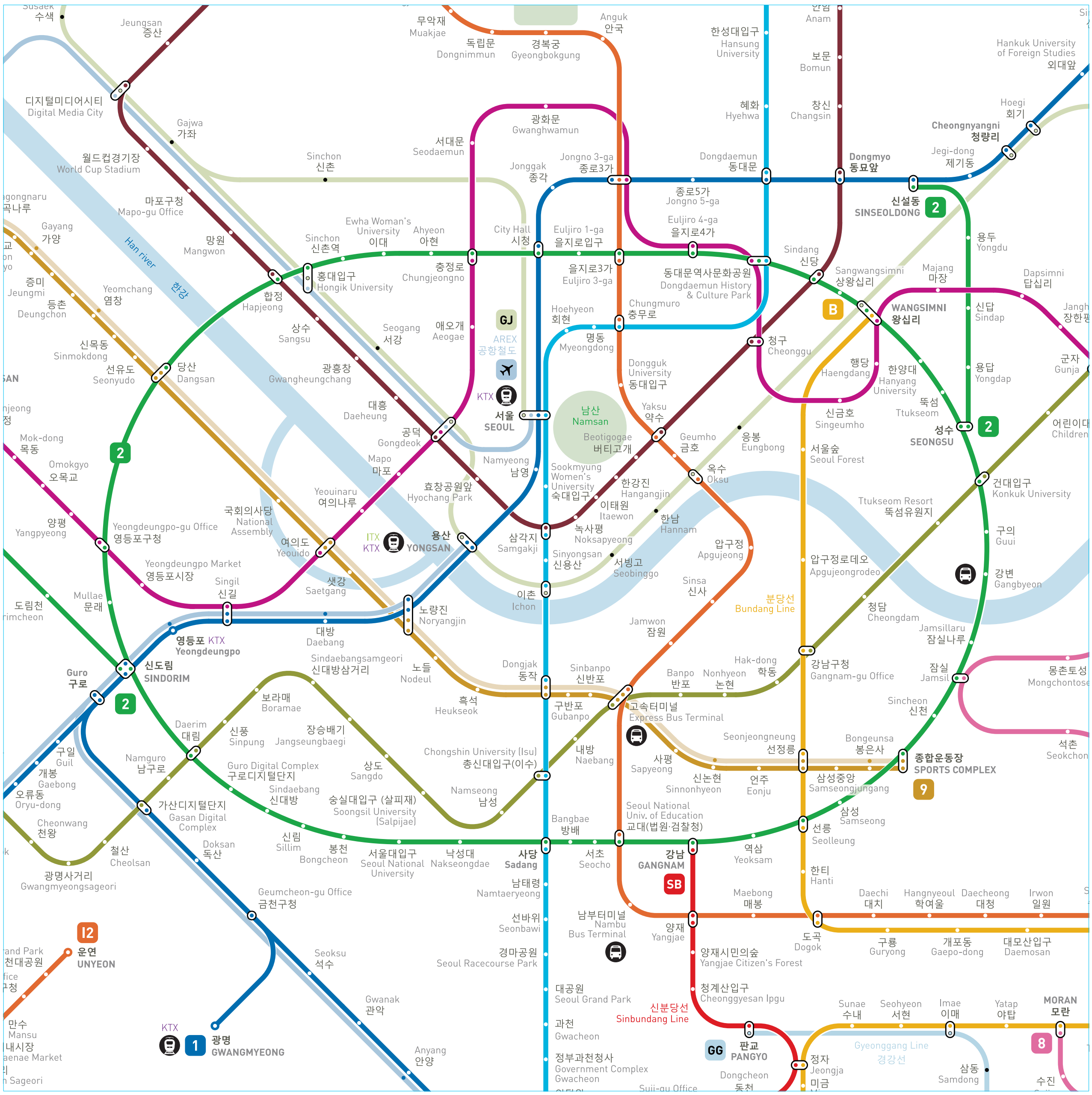
Line 1 (blue), 4 (light blue) and Bundang (yellow) are cross-town regional services connecting Seoul's city center with the surrounding cities of Uijeongbu, Bucheon, Incheon, Ansan, and Suwon. 4 more lines complement this regional scale network. All these lines operate metro trains with frequent services and are metro lines in their full right even though their reach is more similar to that of a commuter rail network.

COMMUTER RAIL LINES

The Airport line Arex links the Seoul Railway Station to Incheon and Gimpo Airports with skip-stop direct services as well as local services.

With new urbanization on the way and ridership growth, it is bound to become a regular metro line.

The Gyeongui-Jungang line (light green) is a regional link operating from the Yongsan railway station on a corridor along the northern shore of Han River.



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Dongnimmun
경복궁
Gyeongbokgung
Anguk
안국
한성대입구
Hansung University
Anam
보문
Bomun
Hankuk University of Foreign Studies
외대앞
디지털미디어시티
Digital Media City
Gajwa
가좌
광화문
Gwanghwamun
혜화
Hyehwa
창신
Changsin
Hoegi
회기
Cheongnyangni
청량리
월드컵경기장
World Cup Stadium
Sinchon
신촌
서대문
Seodaemun
Jonggak
종각
Jongno 3-ga
종로3가
Dongdaemun
동대문
Dongmyo
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Jegi-dong
제기동
마포구청
Mapo-gu Office
종로5가
Jongno 5-ga
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2
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이대
Ahyeon
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Sinchon
신촌역
City Hall
시청
Euljiro 1-ga
을지로입구
Euljiro 4-ga
을지로4가
용두
Yongdu
증미
Jeungmi
Han river
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홍대입구
Hongik University
충정로
Chungjeongno
을지로3가
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Dongdaemun History & Culture Park
Sindang
신당
Sangwangsimni
상왕십리
Majang
마장
Dapsimni
답십리
등촌
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Yeomchang
염창
합정
Hapjeong
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Seogang
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Aeogae
AREX
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Ttukseom Resort
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한남
Hannam
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Guui
양평
Yangpyeong
Yeongdeungpo-gu Office
영등포구청
국회의사당
National Assembly
삼각지
Samgakji
녹사평
Noksapyeong
압구정
Apgujeong
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신용산
서빙고
Seobinggo
압구정로데오
Apgujeongrodeo
강변
Gangbyeon
Yeongdeungpo Market
영등포시장
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신길
Sinsa
신사
샛강
Saetgang
Mullae
문래
이촌
Ichon
Bundang Line
분당선
청담
Cheongdam
도림천
Dorimcheon
노량진
Noryangjin
Jamwon
잠원
Jamsillaru
잠실나루
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Yangjae Citizen's Forest
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정부과천청사
Government Complex Gwacheon
정자
Jeongja
삼동
Samdong
수진
Dongcheon
동천
미금
Suji-gu Office

NAMSAN MOUNTAIN

DOWNTOWN

YEOUIDO ISLAND

GANGNAM

LONDON

HARMONIOUS RANDOMNESS

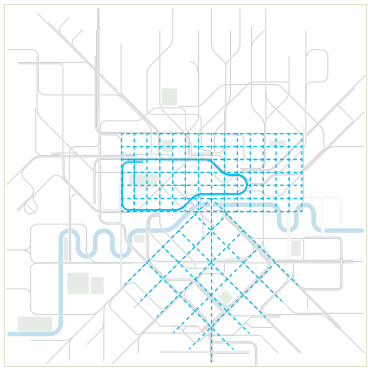
From Westminster to the City, the center of London is permeated by metro and commuter networks radiating out to a vast metropolitan region.

All Underground lines converge towards the Circle line loop and create a dense web of transfer stations inside of it. Even though they mainly follow the irregular street layout of the historic center, the resulting pattern is very close to that of a regular orthogonal grid.

Commuter rail lines originate from the central rail terminals scattered around the edges of the loop, with the exception of the cross-town Thameslink line. The commuter network is particularly dense and complex south of the Thames where Underground lines are scarce.

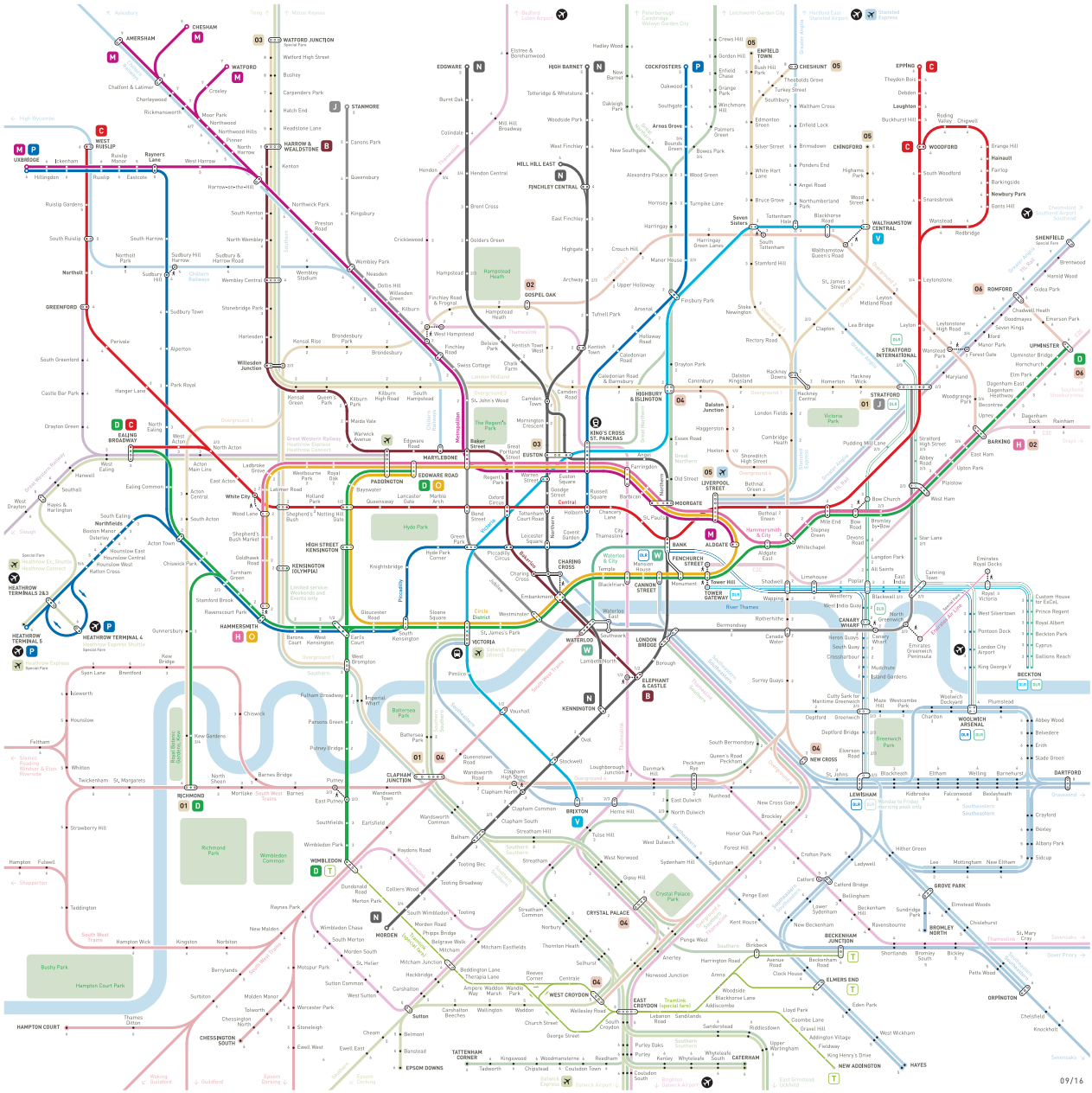
The Docklands Light Railway (DLR) connects the City to the eastern reaches of the Thames, where former docks have become a financial center.

The Overground orbital network provides tangential connections outside the Circle loop.



STRUCTURE

UNDERGROUND NETWORK



LONDON

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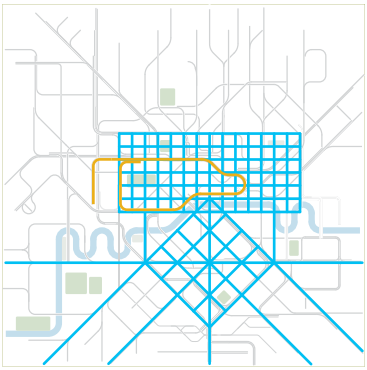
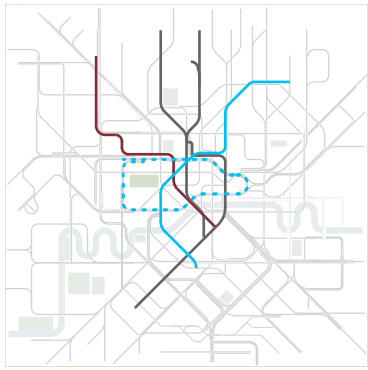
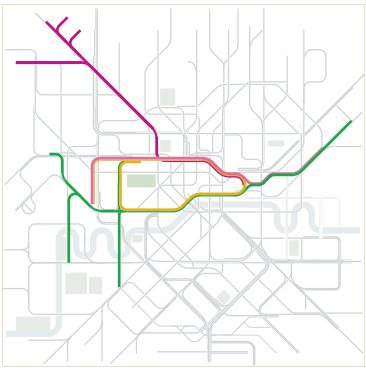


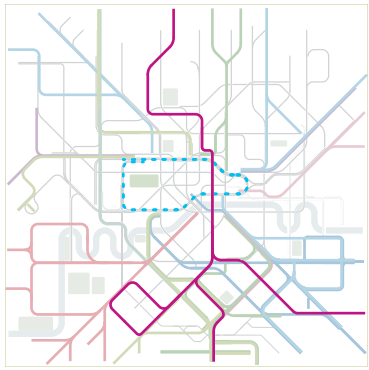
CITYSCAPE



NORTH-SOUTH

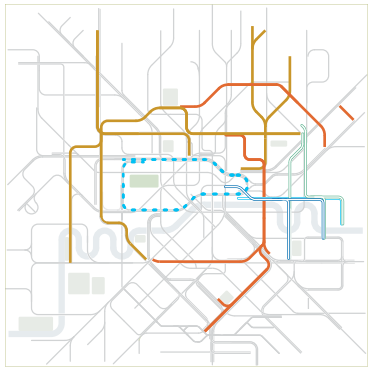


CIRCLE LINE LOOP



COMMUTER RAIL

EAST-WEST



OVERGROUND AND DLR

CITYSCAPE

Major parks and the Thames River provide orientation clues.

North of the Thames, inside the city center, Underground lines form a dense web which can be schematized as a regular grid pattern.

South of the Thames, three commuter rail networks converge towards the central terminals; their lines are interconnected. This complex pattern can be schematized as a quadrant containing a regular orthogonal grid tilted at 45°.

CIRCLE LINE LOOP

The Circle line (yellow) used to run in a full loop around central London. The loop is no longer closed and the line has two separate terminal stations.

The Metropolitan line (magenta) and the Hammersmith and City line (pink) share the northern half of the loop's track. The District line (green) shares the southern half.

EAST-WEST

The Piccadilly (blue), Central (red), and Jubilee (grey) lines run through central London on a mainly east-west course.

NORTH-SOUTH

The Bakerloo (brown), Victoria (light blue), and Northern (dark grey) lines cross the loop on a north-south axis.

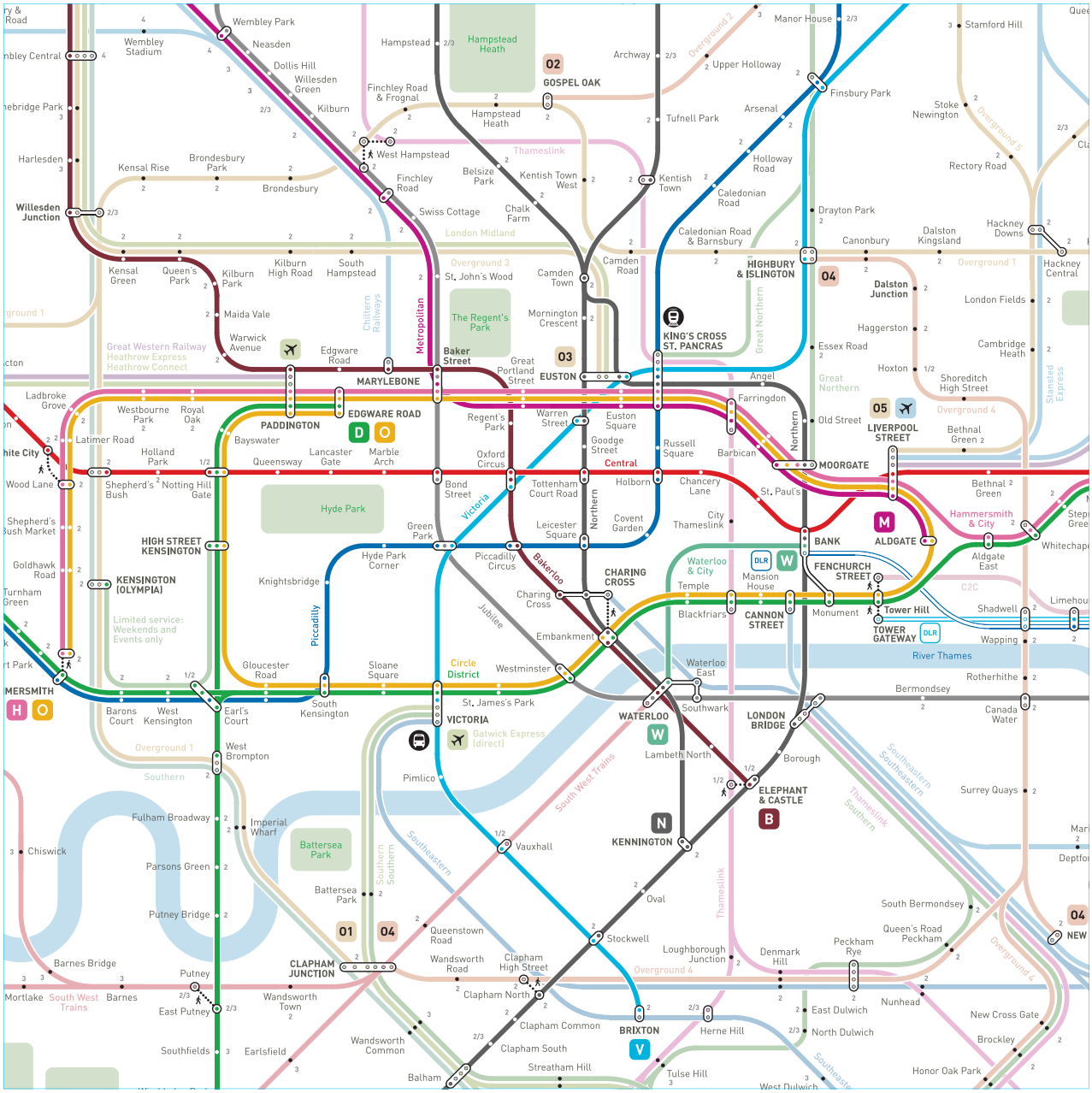
COMMUTER RAIL

Commuter rail lines form independent networks originating from dedicated central London terminals.
The Thameslink (magenta) is the only network providing a cross-town connection from suburb to suburb on either side of the city center.

COMMUTER RAIL

Overground lines provide orbital cross-town connections outside the Circle loop. However, their low frequency sets them apart from the Underground.

The Docklands Light Railway connects central London, particularly the City of London, to the newly developed neighborhoods along the Thames to the east.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Willesden Green
Kilburn
Hampstead
Hampstead Heath
Finchley Road & Frognal
Hampstead Heath
02
GOSPEL OAK
Archway
Overground 2
Upper Holloway
Manor House
Stamford Hill
Harlesden
Kensal Rise
Brondesbury Park
Brondesbury
West Hampstead
Thameslink
Finchley Road
Belsize Park
Kentish Town West
Kentish Town
Tufnell Park
Arsenal
Finsbury Park
Stoke Newington
Overground 5
Rectory Road
Willesden Junction
Swiss Cottage
Chalk Farm
London Midland
Caledonian Road
Holloway Road
Caledonian Road & Barnsbury
Drayton Park
Canonbury
Dalston Kingsland
Hackney Downs
Hackney Central
Kensal Green
Queen's Park
Kilburn Park
Kilburn High Road
South Hampstead
Overground 3
St. John's Wood
Camden Town
Camden Road
HIGHBURY & ISLINGTON
04
Dalston Junction
Overground 1
London Fields
Maida Vale
Chiltern Railways
Metropolitan
The Regent's Park
Mornington Crescent
KING'S CROSS ST. PANCRAS
Great Northern
Haggerston
Essex Road
Cambridge Heath
Great Western Railway
Heathrow Express
Heathrow Connect
Warwick Avenue
Edgware Road
Baker Street
Great Portland Street
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EUSTON
Angel
Hoxton
Shoreditch High Street
Stansted Express
Great Northern
Ladbroke Grove
Westbourne Park
Royal Oak
MARYLEBONE
PADDINGTON
EDGWARE ROAD
Farringdon
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Old Street
LIVERPOOL STREET
Overground 4
Latimer Road
Holland Park
Bayswater
Queensway
Lancaster Gate
Marble Arch
Regent's Park
Warren Street
Euston Square
Goodge Street
Russell Square
Barbican
Northern
MOORGATE
Bethnal Green
Wood Lane
Shepherd's Bush
Notting Hill Gate
Hyde Park
Oxford Circus
Tottenham Court Road
Central
Holborn
Chancery Lane
St. Paul's
Bond Street
Victoria
Leicester Square
Northern
Covent Garden
City Thameslink
Hammersmith & City
Whitechapel
Shepherd's Bush Market
HIGH STREET KENSINGTON
Green Park
Piccadilly Circus
Bakerloo
CHARING CROSS
Waterloo & City
DLR
W
Mansion House
FENCHURCH STREET
BANK
ALDGATE
Aldgate East
Goldhawk Road
KENSINGTON (OLYMPIA)
Knightsbridge
Hyde Park Corner
Charing Cross
Temple
Blackfriars
CANNON STREET
Monument
Tower Hill
TOWER GATEWAY
DLR
Shadwell
Limehouse
Turnham Green
Limited service: Weekends and Events only
Piccadilly
Jubilee
Embankment
Wapping
C2C
Gloucester Road
Sloane Square
Circle
District
Westminster
Waterloo East
River Thames
Rotherhithe
Bermondsey
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Barons Court
West Kensington
Earl's Court
South Kensington
St. James's Park
WATERLOO
Southwark
LONDON BRIDGE
Canada Water
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Borough
Pimlico
South West Trains
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KENNINGTON
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Parsons Green
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Peckham Rye
Queen's Road Peckham
Barnes Bridge
CLAPHAM JUNCTION
Wandsworth Road
Clapham High Street
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Wandsworth Town
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Nunhead
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North Dulwich
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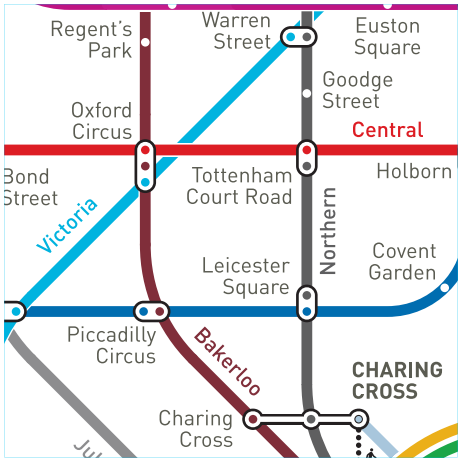
Balham
Tulse Hill
Honor Oak Park



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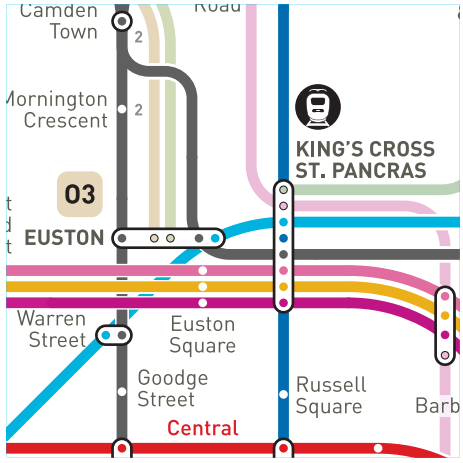
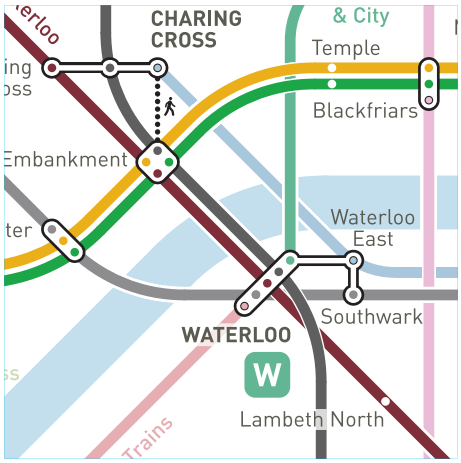
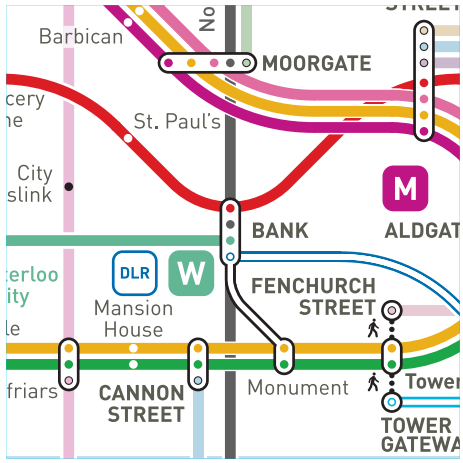


EUSTON, KING'S CROSS, ST. PANCRAS



WATERLOO



THE CITY

NEW YORK

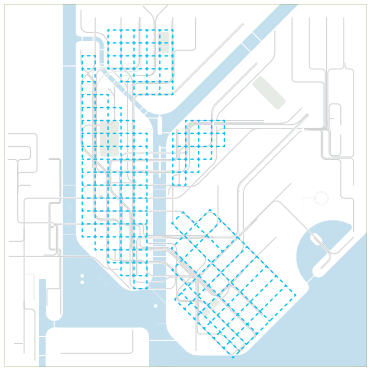
GRIDS ACROSS THE ARCHIPELAGO

New York City became the major harbor of the eastern coast of the United States when the Erie Canal connected the Hudson River to the Great Lakes, thus opening up a major trade route to the interior of the continent. From the southern tip of Manhattan Island, the city expanded north following a strict orthogonal street pattern of east-west streets and north-south avenues. The grid is broken only by the historic path of Broadway and the vast rectangular expanse of Central Park.

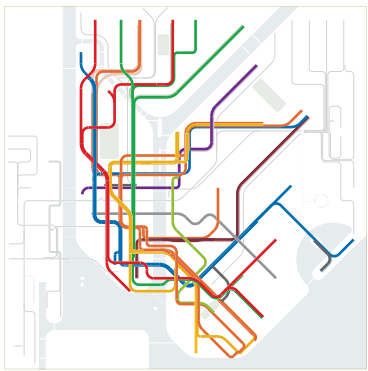
A similar grid pattern was implemented in the other boroughs with Brooklyn boasting tilted axes.

In Manhattan, subway lines run on a north-south course, parallel to each other, from Downtown towards Midtown and the Bronx or on an east-west course across the East River towards Brooklyn and Queens.

In Manhattan, three or four lines share each line corridor providing local and express skip-stop services. The color of a line corresponds to the corridor it serves.



STRUCTURE



SUBWAY NETWORK

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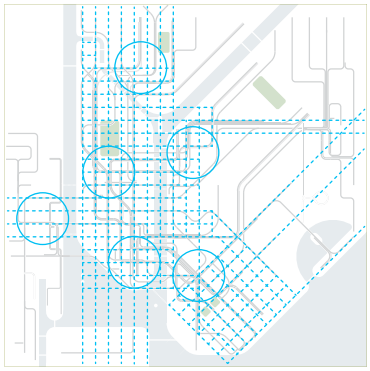
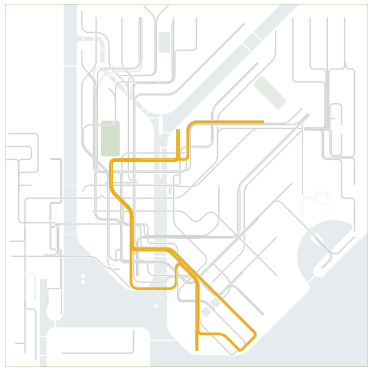


CITYSCAPE



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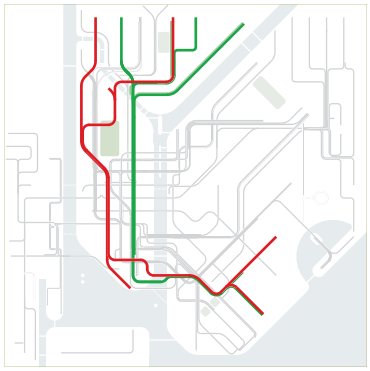
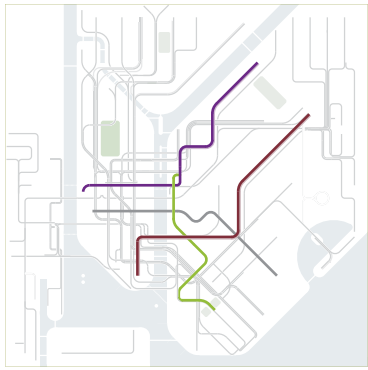
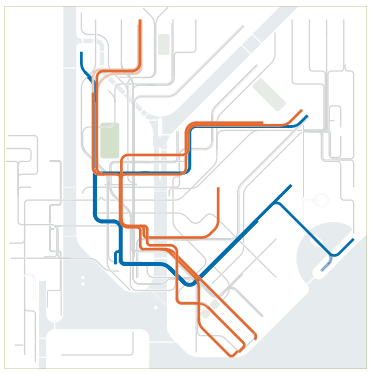


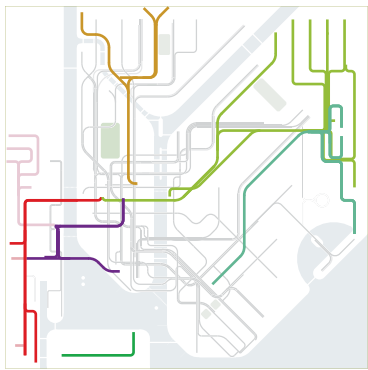
IRT 1-2-3 & 4-5-6



IRT 7, IND G, BMT L & J-Z



IND A-C-E & B-D-F-M



COMMUTER RAIL

CITYSCAPE

The heart of New York is Manhattan Island with its two main centers: Downtown on the southern tip and Midtown south of Central Park.

It is surrounded by the Bronx (north), Queens (east), Brooklyn (south-east), Staten Island (south) and New Jersey (west).

Subway lines connect the Manhattan street grid to surrounding grids across the waterways.

IRT BROADWAY-SEVENTH AVENUE LINE (RED)

1 Broadway-Seventh Avenue Local
2, 3 Seventh Avenue Express

IRT LEXINGTON AVENUE LINE (GREEN)

4, 5 Lexington Avenue Express
6 Lexington Avenue Local and
Pelham Local/Express

IND EIGHTH AVENUE LINE (BLUE)

A Eighth Avenue Express
C, E Eighth Avenue Local

IND SIXTH AVENUE LINE (ORANGE)

B, D Sixth Avenue Express
F, M Sixth Avenue Local

BMT BROADWAY LINE (YELLOW)

Q, N Broadway Express
R, W Broadway Local

IRT FLUSHING LINE (VIOLET)

7 Flushing Local and Express

IND CROSSTOWN LINE (LIGHT GREEN)

G Brooklyn-Queens Crosstown Local

BMT CANARSIE LINE (GREY)

L 14th Street-Canarsie Local

BMT NASSAU STREET LINE (BROWN)

J Nassau Street Local/Express
Z Nassau Street Express

COMMUTER RAIL

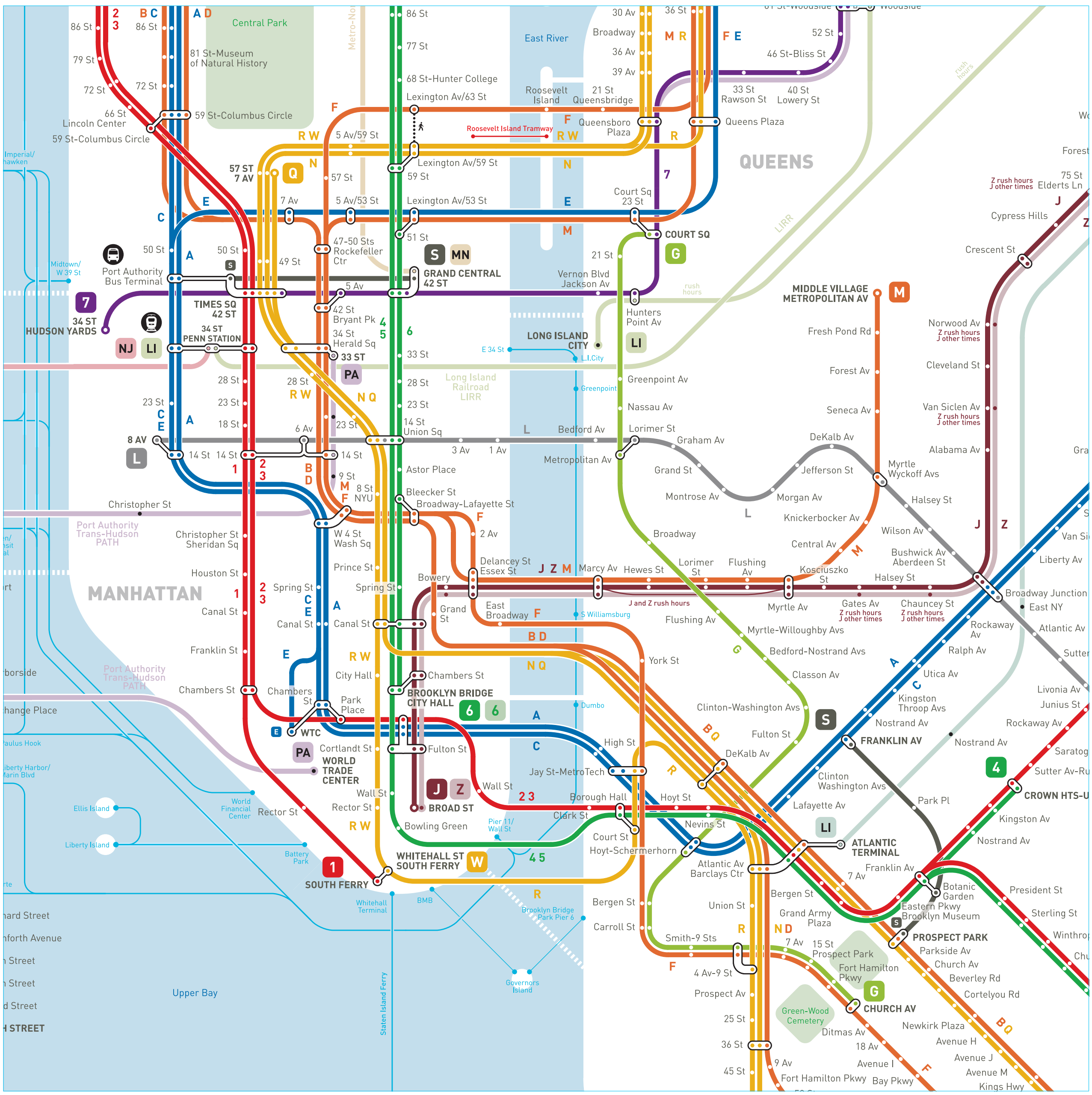
Long Island Railroad—LIRR (light green and turquoise): from Penn Station and Atlantic Terminal to Long Island.

New Jersey Transit (red): from Penn Station to New Jersey and Newark.

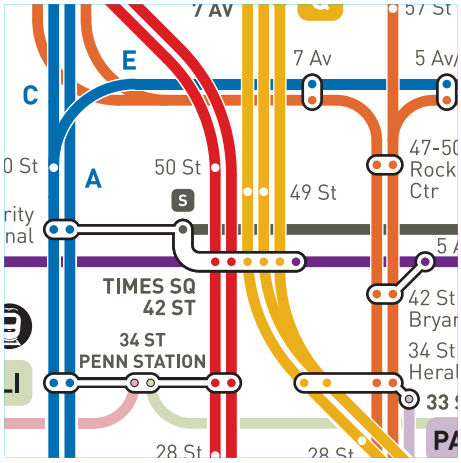
Metro-North (brown): from Grand Central to upstate New York and Connecticut.

Port Authority Trans-Hudson—PATH (violet): from Manhattan to New Jersey.

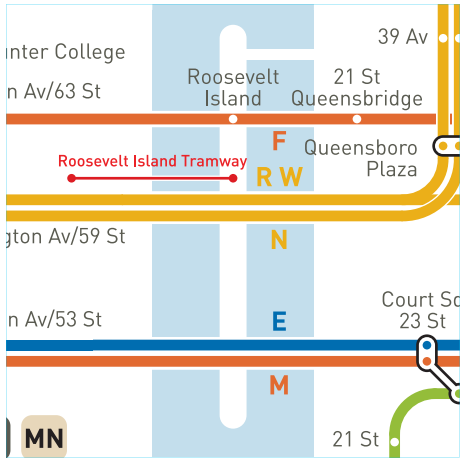
Staten Island Railway (green).



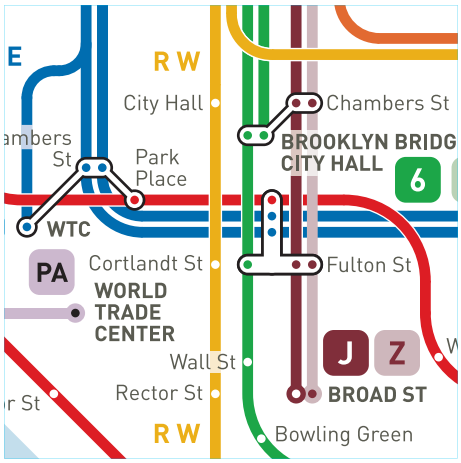
Central Park
86 St
79 St
72 St
66 St Lincoln Center
59 St-Columbus Circle
81 St-Museum of Natural History
77 St
68 St-Hunter College
Lexington Av/63 St
5 Av/59 St
Lexington Av/59 St
57 St 7 Av
57 St
7 Av
5 Av/53 St
Lexington Av/53 St
51 St
50 St
49 St
47-50 Sts Rockefeller Ctr
Port Authority Bus Terminal
GRAND CENTRAL 42 ST
5 Av
TIMES SQ 42 ST
34 ST HUDSON YARDS
34 ST PENN STATION
42 St Bryant Pk
34 St Herald Sq
33 ST
33 St
28 St
23 St
18 St
14 St
8 AV
6 Av
14 St Union Sq
3 Av
1 Av
Astor Place
Christopher St
9 St
8 St NYU
W 4 St Wash Sq
Christopher St Sheridan Sq
Port Authority Trans-Hudson PATH
Houston St
Bleecker St
Broadway-Lafayette St
2 Av
Prince St
Spring St
Delancey St Essex St
Bowery
Grand St
East Broadway
Canal St
Franklin St
Chambers St
City Hall
Park Place
BROOKLYN BRIDGE CITY HALL
WTC
Cortlandt St
WORLD TRADE CENTER
Fulton St
Wall St
BROAD ST
Rector St
Bowling Green
WHITEHALL ST SOUTH FERRY
SOUTH FERRY
MANHATTAN
Roosevelt Island Tramway
Roosevelt Island
East River
21 St Queensbridge
Queensboro Plaza
Court Sq 23 St
COURT SQ
21 St
Vernon Blvd Jackson Av
Hunters Point Av
LONG ISLAND CITY
Long Island Railroad LIRR
Greenpoint Av
Nassau Av
Metropolitan Av
Lorimer St
Graham Av
Grand St
Montrose Av
Morgan Av
Jefferson St
DeKalb Av
Myrtle Wyckoff Avs
Broadway
Flushing Av
Marcy Av
Hewes St
Lorimer St
Flushing Av
Myrtle-Willoughby Avs
Bedford-Nostrand Avs
Classon Av
Clinton-Washington Avs
Fulton St
Bedford Av
30 Av
Broadway
36 Av
39 Av
36 St
QUEENS
33 St Rawson St
40 St Lowery St
46 St-Bliss St
52 St
Queens Plaza
MIDDLE VILLAGE METROPOLITAN AV
Fresh Pond Rd
Forest Av
Seneca Av
Norwood Av
Cleveland St
Van Siclen Av
Alabama Av
Cypress Hills
Crescent St
75 St Elderts Ln
Knickerbocker Av
Central Av
Wilson Av
Bushwick Av Aberdeen St
Halsey St
Kosciuszko St
Myrtle Av
Gates Av
Chauncey St
Broadway Junction
East NY
Atlantic Av
Rockaway Av
Ralph Av
Utica Av
Kingston Throop Avs
Nostrand Av
FRANKLIN AV
Park Pl
CROWN HTS-UTICA AV
Kingston Av
Nostrand Av
ATLANTIC TERMINAL
Atlantic Av Barclays Ctr
Lafayette Av
Clinton Washington Avs
DeKalb Av
Nevins St
Hoyt St
Borough Hall
Jay St-MetroTech
High St
York St
Clark St
Court St
Hoyt-Schermerhorn
Bergen St
Carroll St
Union St
Smith-9 Sts
4 Av-9 St
Prospect Av
25 St
36 St
45 St
Bergen St
Grand Army Plaza
7 Av
15 St Prospect Park
Fort Hamilton Pkwy
CHURCH AV
Green-Wood Cemetery
Ditmas Av
18 Av
Avenue I
Bay Pkwy
9 Av
Fort Hamilton Pkwy
Franklin Av
Botanic Garden
Eastern Pkwy Brooklyn Museum
PROSPECT PARK
Parkside Av
Church Av
Beverley Rd
Cortelyou Rd
Newkirk Plaza
Avenue H
Avenue J
Avenue M
Kings Hwy
President St
Sterling St
Upper Bay
Ellis Island
Liberty Island
Governors Island
Staten Island Ferry
Whitehall Terminal
Brooklyn Bridge Park Pier 6
Pier 11/ Wall St
Battery Park
World Financial Center
Exchange Place
Harborside



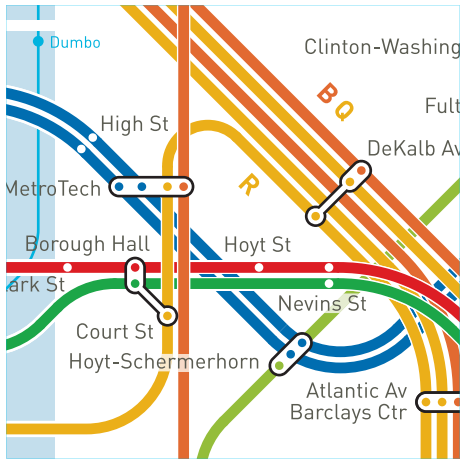
MIDTOWN MANHATTAN



ROOSEVELT ISLAND



DOWNTOWN MANHATTAN



DOWNTOWN BROOKLYN

PARIS

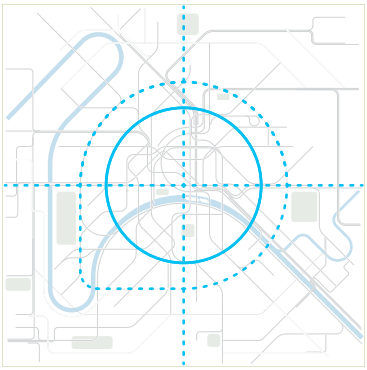
RIVE GAUCHE, RIVE DROITE

The Seine River flows through Paris from east to west and splits the city into two uneven parts, the Left Bank to the south and the Right Bank to the north. This left and right split is a fundamental element of the city's identity. Traditionally, the Left Bank was the realm of the university, the Right Bank belonged to the merchants while power, both spiritual and temporal, had its seat on the Cité Island in the middle.

The metro network highlights the other symbolic elements of the Parisian cityscape. Line 1 (yellow) follows the Triumphal Way, a historic axis linking La Défense to the Louvre through the Champs-Élysées Avenue, in a straight line with a single detour to Gare de Lyon.

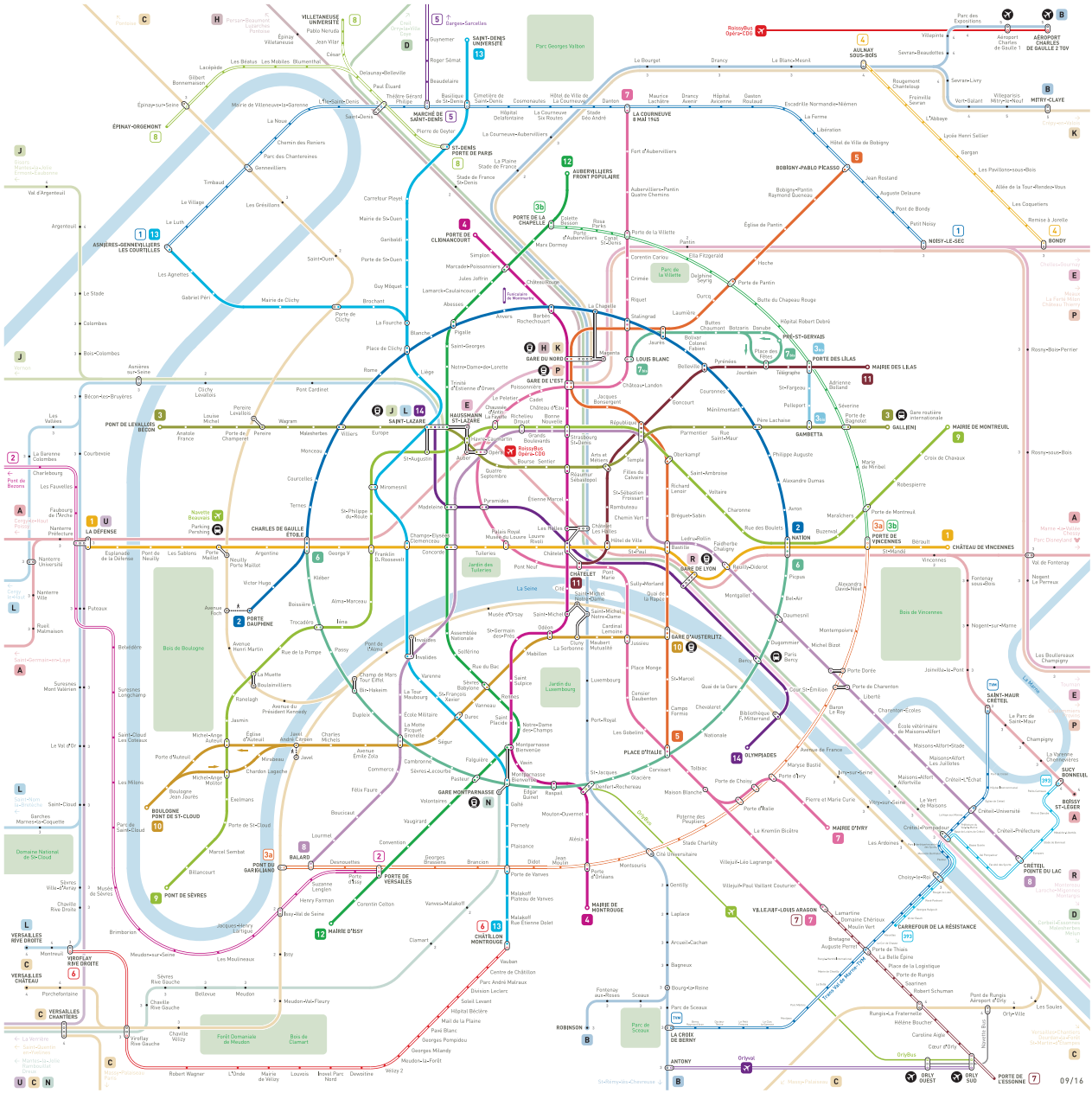
Line 2 (blue) and line 6 (turquoise) form a loop that follows a ring of boulevards marking the center of Paris. Most transfers are located within the enclosed area. Tramway lines 3a (orange) and 3b (green) form an unfinished loop along the Maréchaux boulevards, the administrative edge of Paris proper.

RER line B (blue) crosses the city on a north-south axis right as the roman cardo maximus did two millennia ago.



STRUCTURE

MÉTRO NETWORK



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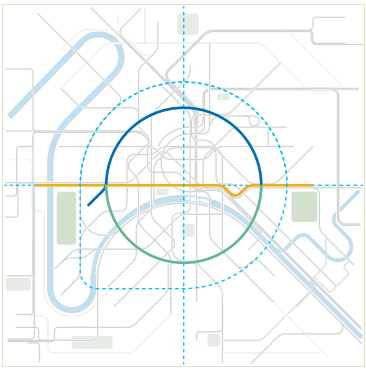
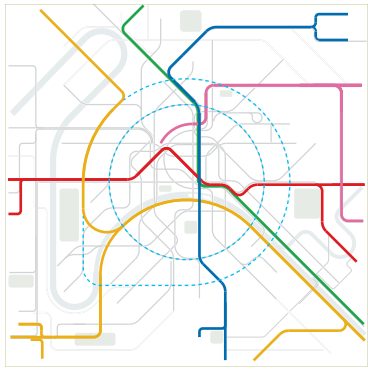
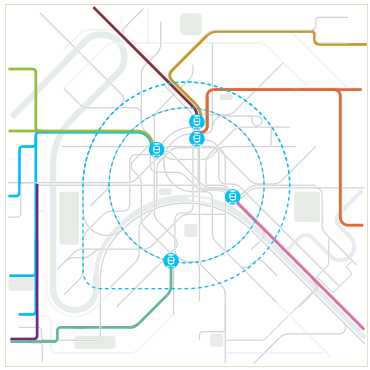


CITYSCAPE



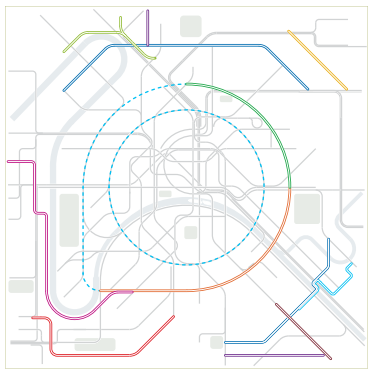
RER

EAST-WEST



TRANSILIEN

NORTH-SOUTH



TRAMWAY AND BRT

CITYSCAPE

The Seine River separates the Left Bank (south) from the Right Bank (north).

The Boulogne and Vincennes woods bound the city west and east.

Line 1 (yellow) follows the Triumphal Way from east to west.

Line 2 (blue) and line 6 (turquoise) form a loop around the inner urban core.

EAST-WEST

Like the Seine River, 5 lines run mainly from east to west, often following the course of the river. 3 of them converge in a narrow corridor from République to Saint-Lazare/Opéra.

Line 14 (purple) is a fast automated line with wide station intervals intended as an express cross-town link.

NORTH-SOUTH

6 lines meander from north to south and connect with each other.

Lines 4 (magenta) and 12 (green) follow separate courses but connect twice at Montparnasse and Montmartre.

The same goes for lines 12 and 13 (light blue) and lines 7 (pink) and 5 (orange).

Line 11 (brown) terminates in the very center at Châtelet.

RÉSEAU EXPRESS RÉGIONAL (RER)

The RER is a cross-town commuter rail network with high frequency trunk lines inside the city center and lower frequency branches at the periphery. It effectively works as an express metro inside the urban core. East-west line A (red) and north-south line B (blue) form the backbone of the network.

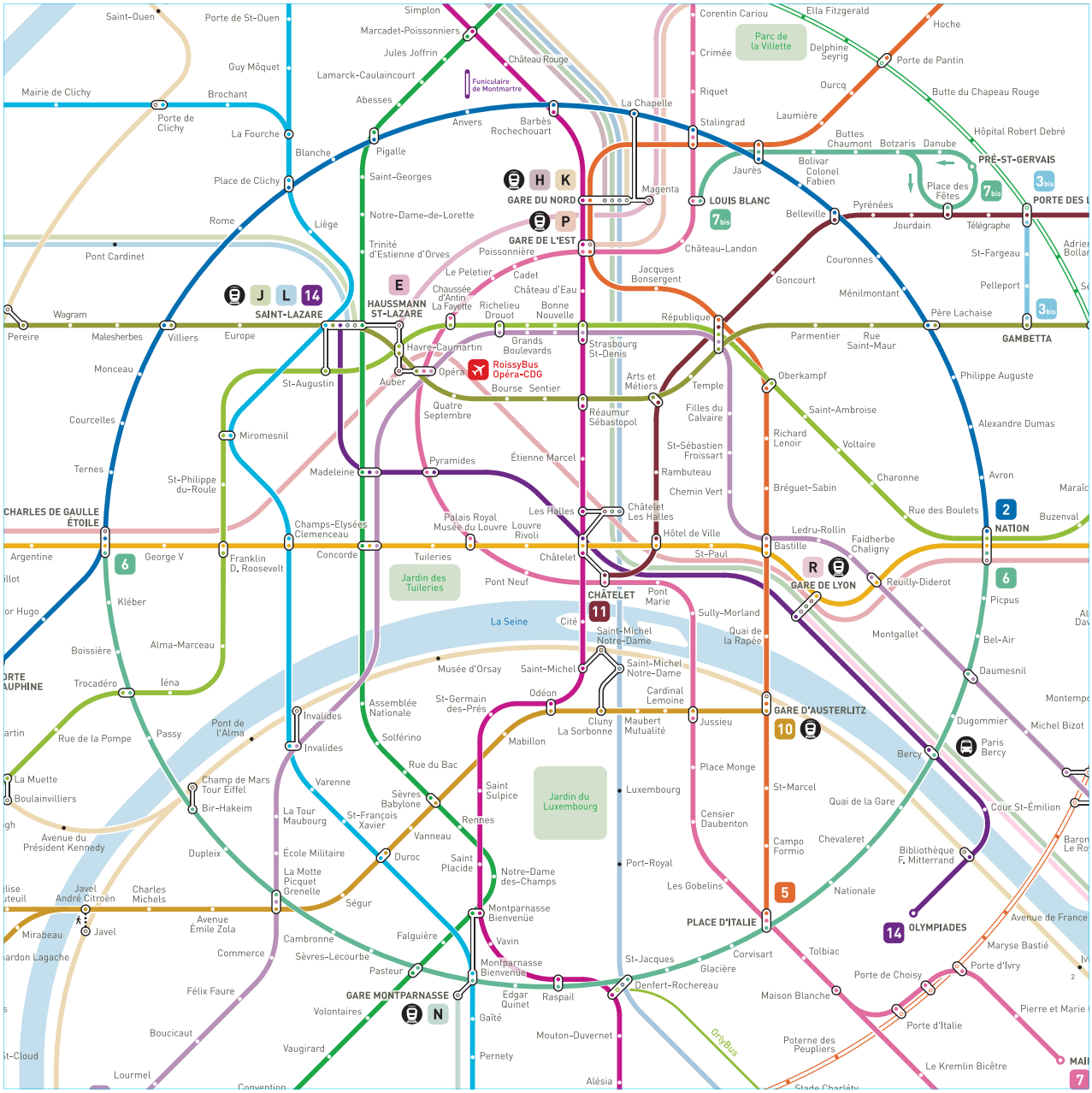
TRANSILIEN

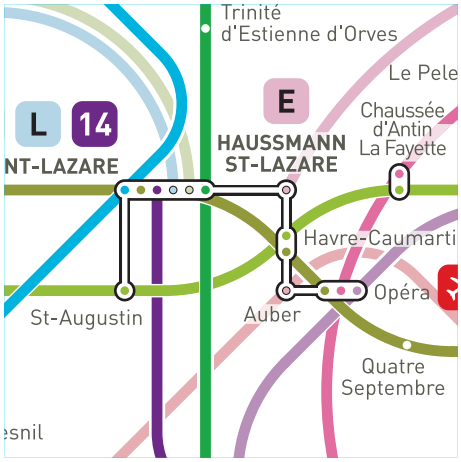
Transilien commuter rail lines originate from 5 rail terminals in the city center. They complement the RER network and also serve areas beyond its reach.

TRAMWAY AND BUS RAPID TRANSIT

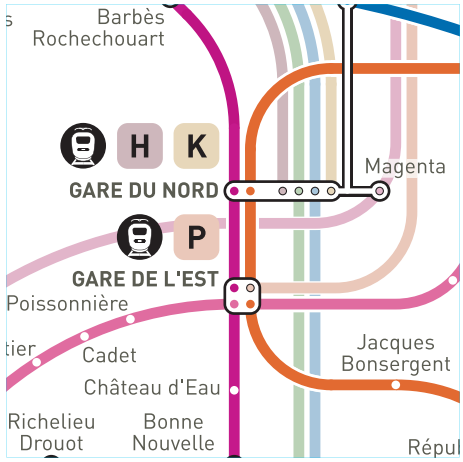
Tramway lines complement the metro and RER networks outside of the city center. They provide orbital connections from one suburban district to another.

Lines 3a (orange) and 3b (green) follow boulevards on the administrative boundary of Paris.

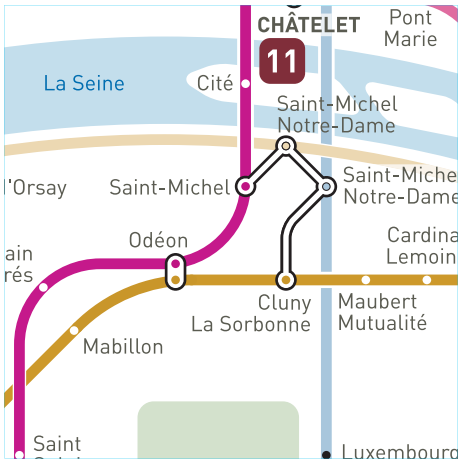

Saint-Ouen
Porte de St-Ouen
Simplon
Marcadet-Poissonniers
Jules Joffrin
Lamarck-Caulaincourt
Abbesses
Funiculaire de Montmartre
Château Rouge
Anvers
Barbès Rochechouart
La Chapelle
Corentin Cariou
Ella Fitzgerald
Hoche
Parc de la Villette
Crimée
Delphine Seyrig
Porte de Pantin
Riquet
Ourcq
Butte du Chapeau Rouge
Stalingrad
Laumière
Buttes Chaumont
Botzaris
Danube
Hôpital Robert Debré
Jaurès
Bolivar
Colonel Fabien
PRÉ-ST-GERVAIS
Place des Fêtes
7bis
3bis
PORTE DES L
Mairie de Clichy
Guy Môquet
Brochant
Porte de Clichy
La Fourche
Blanche
Pigalle
Place de Clichy
Saint-Georges
H K
GARE DU NORD
Magenta
LOUIS BLANC
Rome
Liège
Notre-Dame-de-Lorette
P
GARE DE L'EST
Belleville
Pyrénées
Jourdain
Télégraphe
Pont Cardinet
Trinité d'Estienne d'Orves
Poissonnière
Château-Landon
Couronnes
St-Fargeau
Adrien Bollart
Le Peletier
Cadet
Jacques Bonsergent
Goncourt
Pelleport
Ménilmontant
J L 14
SAINT-LAZARE
E
HAUSSMANN ST-LAZARE
Chaussée d'Antin La Fayette
Richelieu Drouot
Château d'Eau
Bonne Nouvelle
Wagram
Pereire
Malesherbes
Villiers
Europe
Havre-Caumartin
Grands Boulevards
Strasbourg St-Denis
République
Père Lachaise
GAMBETTA
Parmentier
Rue Saint-Maur
Monceau
St-Augustin
Auber
Opéra
RoissyBus Opéra-CDG
Bourse
Sentier
Arts et Métiers
Temple
Oberkampf
Philippe Auguste
Courcelles
Quatre Septembre
Réaumur Sébastopol
Filles du Calvaire
Saint-Ambroise
Alexandre Dumas
Miromesnil
Richard Lenoir
Voltaire
Ternes
Pyramides
Étienne Marcel
St-Sébastien Froissart
Madeleine
Rambuteau
Charonne
Avron
St-Philippe du-Roule
Bréguet-Sabin
Chemin Vert
Maraîc
CHARLES DE GAULLE ÉTOILE
Les Halles
Châtelet Les Halles
Rue des Boulets
2
NATION
Buzenval
Champs-Élysées Clemenceau
Palais Royal Musée du Louvre
Louvre Rivoli
Hôtel de Ville
Ledru-Rollin
Argentine
George V
Franklin D. Roosevelt
Concorde
Tuileries
Châtelet
Bastille
Faidherbe Chaligny
St-Paul
6
R
GARE DE LYON
Reuilly-Diderot
Picpus
Jardin des Tuileries
Pont Neuf
CHÂTELET
11
Pont Marie
Sully-Morland
Kléber
La Seine
Cité
Saint-Michel Notre-Dame
Quai de la Rapée
Montgallet
Bel-Air
Boissière
Alma-Marceau
Musée d'Orsay
Saint-Michel
Saint-Michel Notre-Dame
Daumesnil
Trocadéro
Iéna
Odéon
Cardinal Lemoine
GARE D'AUSTERLITZ
Montempc
Assemblée Nationale
St-Germain des-Prés
Jussieu
10
Dugommier
Michel Bizot
Invalides
Cluny La Sorbonne
Maubert Mutualité
Pont de l'Alma
Rue de la Pompe
Passy
Solférino
Mabillon
Bercy
Paris Bercy
Invalides
Rue du Bac
Place Monge
La Muette
Champ de Mars Tour Eiffel
Varenne
Saint Sulpice
Jardin du Luxembourg
Luxembourg
St-Marcel
Cour St-Émilion
Boulainvilliers
Bir-Hakeim
Sèvres Babylone
Quai de la Gare
Avenue du Président Kennedy
La Tour Maubourg
St-François Xavier
Rennes
Vaneau
Censier Daubenton
Chevaleret
Dupleix
École Militaire
Duroc
Saint Placide
Campo Formio
Bibliothèque F. Mitterrand
Port-Royal
Notre-Dame des-Champs
Les Gobelins
Nationale
Javel André Citroën
Charles Michels
Ségur
Montparnasse Bienvenüe
5
PLACE D'ITALIE
14
OLYMPIADES
Avenue de France
Mirabeau
Javel
Avenue Émile Zola
Falguière
Vavin
Maryse Bastié
Cambronne
Commerce
Sèvres-Lecourbe
Montparnasse Bienvenüe
St-Jacques
Corvisart
Tolbiac
Porte de Choisy
Porte d'Ivry
Pasteur
Glacière
Félix Faure
GARE MONTPARNASSE
N
Edgar Quinet
Raspail
Denfert-Rochereau
Maison Blanche
Volontaires
Gaîté
Pierre et Marie
Boucicaut
Mouton-Duvernet
Porte d'Italie
Vaugirard
Pernety
Poterne des Peupliers
Le Kremlin Bicêtre
Lourmel
Convention
Alésia
OrlyBus
Stade Charléty
7



OPÉRA - GARE SAINT-LAZARE



GARE DU NORD, GARE DE L'EST



QUARTIER LATIN

CHÂTELET

TOKYO

A MOST ECSTATIC MAZE

From the city center east of the Imperial Palace, Tokyo expanded in all directions, around the palace, towards the sea, and along the bay. Eventually, the sprawling city occupied most of the Kanto plain and land was even reclaimed from the sea. This immense urban region is permeated by an impressively dense rail network that constitutes the essential mode of urban travel.

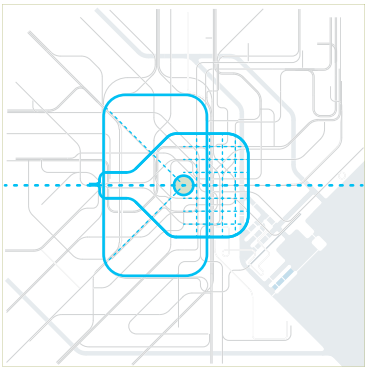
The metro serves the inner core around the historic city center and is only one part of this massive system.

Like the urban fabric, metro lines run from the city center all around the Imperial Palace grounds and towards the periphery.

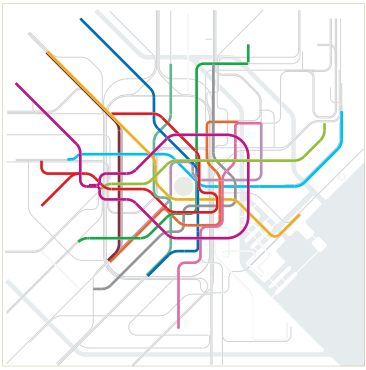
Two loop lines hold the system together. The Oedo line (magenta) emerges from Shinjuku in the west and encircles the city center in the east.

The Yamanote rail line (light green) connects all six central rail terminals and links the metro system with commuter lines.

The entire system is exceptionally integrated. At peak hours, in order to avoid unnecessary transfers, commuter and metro lines interconnect with each other, effectively forming a single longer line. Trains then run from one end of the metropolis to the other, sharing the infrastructure and rolling stock of several different operators.



STRUCTURE



METRO NETWORK

TOKYO

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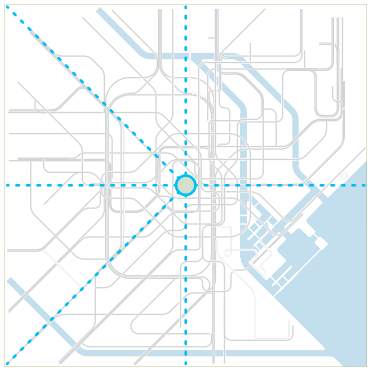
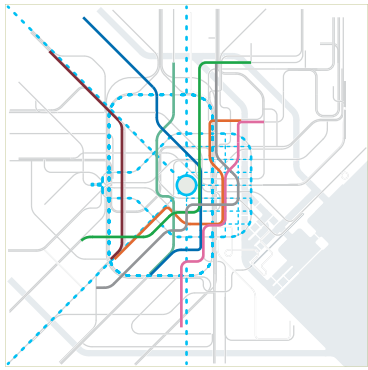
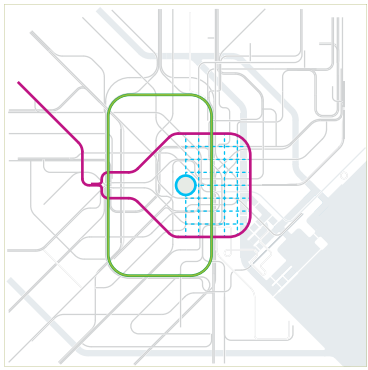


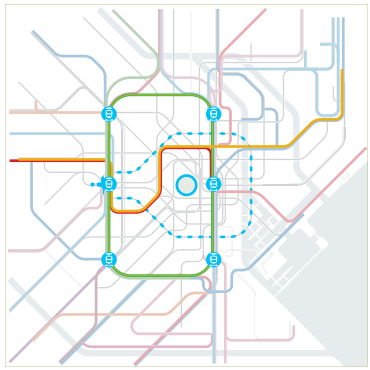
CITYSCAPE



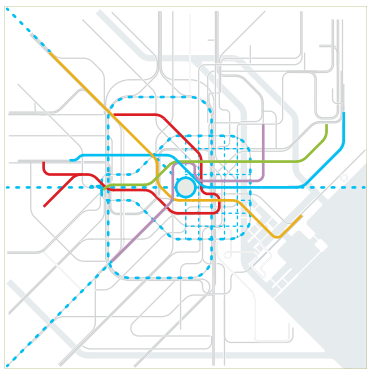
NORTH-SOUTH



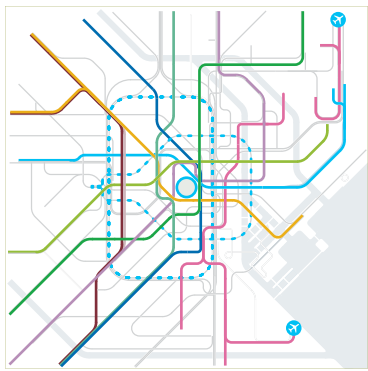
LOOP LINES



COMMUTER RAIL



EAST-WEST



THROUGH SERVICES

CITYSCAPE

At the center is the Imperial Palace (green circle).

The city center to its east is bounded by the Sumida River.

The inner urban core of Tokyo is bordered by the Arakawa River (north-east), Tokyo Bay (south-east), and the Tama River (south).

LOOP LINES

The Oedo line (magenta) marks the boundary of the city center east of the Imperial Palace. It is set upon a horizontal symmetrical axis.

The Yamanote line (light green) is operated by JR East and is not part of the metro network proper. It is the single most important line of the entire system as it directly connects all the main rail terminals and enables tangential orbital connections. It is represented on the map as a rectangle with rounded corners.

EAST-WEST

5 lines follow mainly an east-west direction: Marunouchi (red), Yurakucho (yellow), Tozai (light blue), Hanzomon (purple) and Shinjuku (light green). Each line intersects the others at some point.

NORTH-SOUTH

5 lines run through the Downtown on a north-south course: Mita (blue), Chiyoda (green), Hibiya (grey), Ginza (orange) and Asakusa (pink).

Fukutoshin (brown) and Namboku (turquoise) lines run west of the Imperial Palace.

COMMUTER RAIL

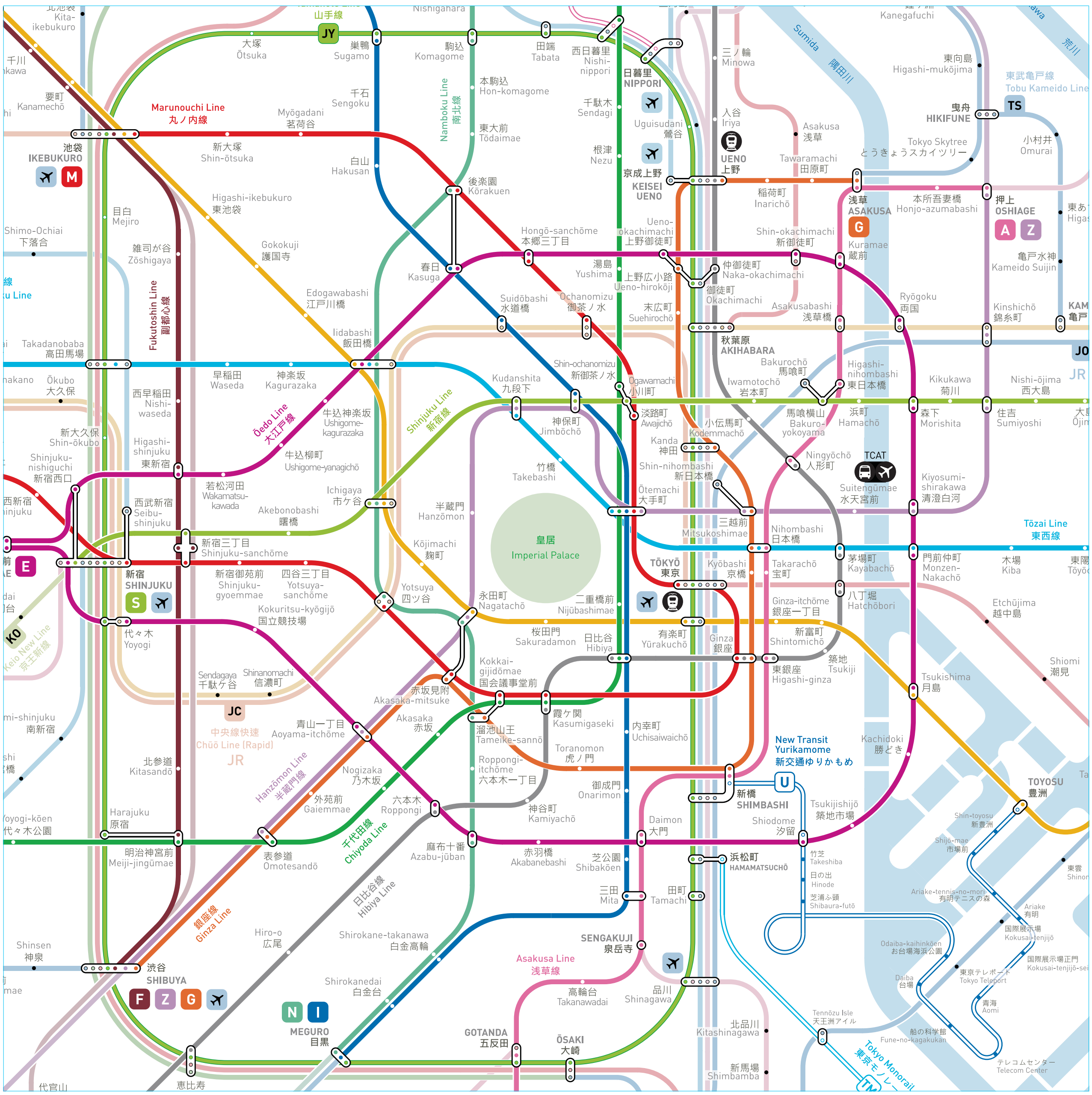
The entire Kanto region is served by an extensive network of interconnected commuter rail networks. Most of them serve one of the 6 main rail terminals or the Yamanote loop. Only the JR Chuo-Sobu (yellow) and Chuo Rapid (red) lines cross the central area from east to west.

THROUGH SERVICES

Most metro lines are connected to commuter lines at their extremities.

This arrangement allows trains to run unimpeded from one end of the metropolitan region to the other through the city center.

For example, trains run successively on Keisei, Asakusa (pink) and Keikyu lines linking Narita and Haneda Airports. Commuter rail and metro lines effectively merge into a single entity from end to end.



山手線
JY
Nishigahara
Kita-ikebukuro
大塚 Ōtsuka
巣鴨 Sugamo
駒込 Komagome
田端 Tabata
西日暮里 Nishi-nippori
日暮里 NIPPORI
三ノ輪 Minowa
Kanegafuchi
Sumida 隅田川
荒川
東向島 Higashi-mukōjima
東武亀戸線 Tobu Kameido Line
鬼舟 HIKIFUNE
TS
小村井 Omurai
要町 Kanamechō
Marunouchi Line 丸ノ内線
千石 Sengoku
茗荷谷 Myōgadani
本駒込 Hon-komagome
東大前 Tōdaimae
千駄木 Sendagi
根津 Nezu
Namboku Line 南北線
Ingüisdani 鶯谷
入谷 Iriya
Asakusa 浅草
UENO 上野
Tawaramachi 田原町
とうきょうスカイツリー Tokyo Skytree
池袋 IKEBUKURO
M
新大塚 Shin-ōtsuka
白山 Hakusan
後楽園 Kōrakuen
京成上野 KEISEI UENO
稲荷町 Inarichō
浅草 ASAKUSA
G
本所吾妻橋 Honjo-azumabashi
押上 OSHIAGE
A
Z
Higashi-ikebukuro 東池袋
Gokokuji 護国寺
Shimo-Ochiai 下落合
目白 Mejiro
雑司が谷 Zōshigaya
Fukutoshin Line 副都心線
Hongō-sanchōme 本郷三丁目
Ueno-okachimachi 上野御徒町
Shin-okachimachi 新御徒町
Kuramae 蔵前
亀戸水神 Kameido Suijin
春日 Kasuga
湯島 Yushima
上野広小路 Ueno-hirokōji
仲御徒町 Naka-okachimachi
御徒町 Okachimachi
Edogawabashi 江戸川橋
Suidōbashi 水道橋
Ochanomizu 御茶ノ水
末広町 Suehirochō
Asakusabashi 浅草橋
Ryōgoku 両国
Kinshichō 錦糸町
Takadanobaba 高田馬場
Iidabashi 飯田橋
秋葉原 AKIHABARA
Bakurochō 馬喰町
Shin-ochanomizu 新御茶ノ水
Higashi-nihombashi 東日本橋
Kikukawa 菊川
Nishi-ōjima 西大島
JR
早稲田 Waseda
神楽坂 Kagurazaka
Kudanshita 九段下
Ogawamachi 小川町
Iwamotochō 岩本町
Ōkubo 大久保
西早稲田 Nishi-waseda
Ōedo Line 大江戸線
牛込神楽坂 Ushigome-kagurazaka
Shinjuku Line 新宿線
神保町 Jimbōchō
淡路町 Awajichō
小伝馬町 Kodemmachō
馬喰横山 Bakuro-yokoyama
浜町 Hamachō
森下 Morishita
住吉 Sumiyoshi
新大久保 Shin-ōkubo
Higashi-shinjuku 東新宿
Shinjuku-nishiguchi 新宿西口
牛込柳町 Ushigome-yanagichō
竹橋 Takebashi
Kanda 神田
Shin-nihombashi 新日本橋
Ningyōchō 人形町
TCAT
Kiyosumi-shirakawa 清澄白河
若松河田 Wakamatsu-kawada
西新宿 Nishi-shinjuku
西武新宿 Seibu-shinjuku
Akebonobashi 曙橋
Ichigaya 市ケ谷
半蔵門 Hanzōmon
Ōtemachi 大手町
三越前 Mitsukoshimae
Suitengūmae 水天宮前
Tōzai Line 東西線
皇居 Imperial Palace
Nihombashi 日本橋
新宿三丁目 Shinjuku-sanchōme
E
Kōjimachi 麴町
東京 TŌKYŌ
Kyōbashi 京橋
Takarachō 宝町
茅場町 Kayabachō
門前仲町 Monzen-nakachō
木場 Kiba
新宿 SHINJUKU
新宿御苑前 Shinjuku-gyoemmae
四谷三丁目 Yotsuya-sanchōme
Yotsuya 四ツ谷
永田町 Nagatachō
二重橋前 Nijūbashimae
八丁堀 Hatchōbori
Ginza-itchōme 銀座一丁目
S
KO
Keio New Line 京王新線
代々木 Yoyogi
Kokuritsu-kyōgijō 国立競技場
桜田門 Sakuradamon
日比谷 Hibiya
有楽町 Yūrakuchō
Ginza 銀座
新富町 Shintomichō
Etchūjima 越中島
Sendagaya 千駄ケ谷
Shinanomachi 信濃町
Kokkai-gijidōmae 国会議事堂前
築地 Tsukiji
東銀座 Higashi-ginza
Shiomi 潮見
Tsukishima 月島
JC
中央線快速 Chūō Line (Rapid)
JR
赤坂見附 Akasaka-mitsuke
霞ケ関 Kasumigaseki
Akasaka 赤坂
溜池山王 Tameike-sannō
内幸町 Uchisaiwaichō
Toranomon 虎ノ門
New Transit Yurikamome 新交通ゆりかもめ
Kachidoki 勝どき
青山一丁目 Aoyama-itchōme
Roppongi-itchōme 六本木一丁目
U
TOYOSU 豊洲
南新宿 Minami-shinjuku
北参道 Kitasandō
Hanzōmon Line 半蔵門線
Nogizaka 乃木坂
御成門 Onarimon
新橋 SHIMBASHI
Shiodome 汐留
Tsukijishijō 築地市場
Shin-toyosu 新豊洲
Shijō-mae 市場前
外苑前 Gaiemmae
六本木 Roppongi
神谷町 Kamiyachō
Daimon 大門
Yoyogi-kōen 代々木公園
Harajuku 原宿
明治神宮前 Meiji-jingūmae
表参道 Omotesandō
千代田線 Chiyoda Line
麻布十番 Azabu-jūban
赤羽橋 Akabanebashi
芝公園 Shibakōen
浜松町 HAMAMATSUCHŌ
竹芝 Takeshiba
日の出 Hinode
芝浦ふ頭 Shibaura-futō
Ariake-tennis-no-mori 有明テニスの森
Ariake 有明
三田 Mita
田町 Tamachi
銀座線 Ginza Line
日比谷線 Hibiya Line
Hiro-o 広尾
Shirokane-takanawa 白金高輪
SENGAKUJI 泉岳寺
Asakusa Line 浅草線
国際展示場 Kokusai-tenjijō
Odaiba-kaihinkōen お台場海浜公園
国際展示場正門 Kokusai-tenjijō-seimon
Shinsen 神泉
渋谷 SHIBUYA
F
Z
G
Shirokanedai 白金台
高輪台 Takanawadai
品川 Shinagawa
東京テレポート Tokyo Teleport
Daiba 台場
青海 Aomi
N
I
MEGURO 目黒
GOTANDA 五反田
ŌSAKI 大崎
Tennōzu Isle 天王洲アイル
船の科学館 Fune-no-kagakukan
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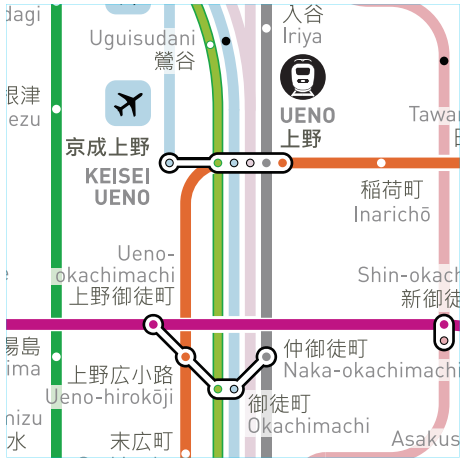
北品川 Kitashinagawa
新馬場 Shimbamba
恵比寿
代官山

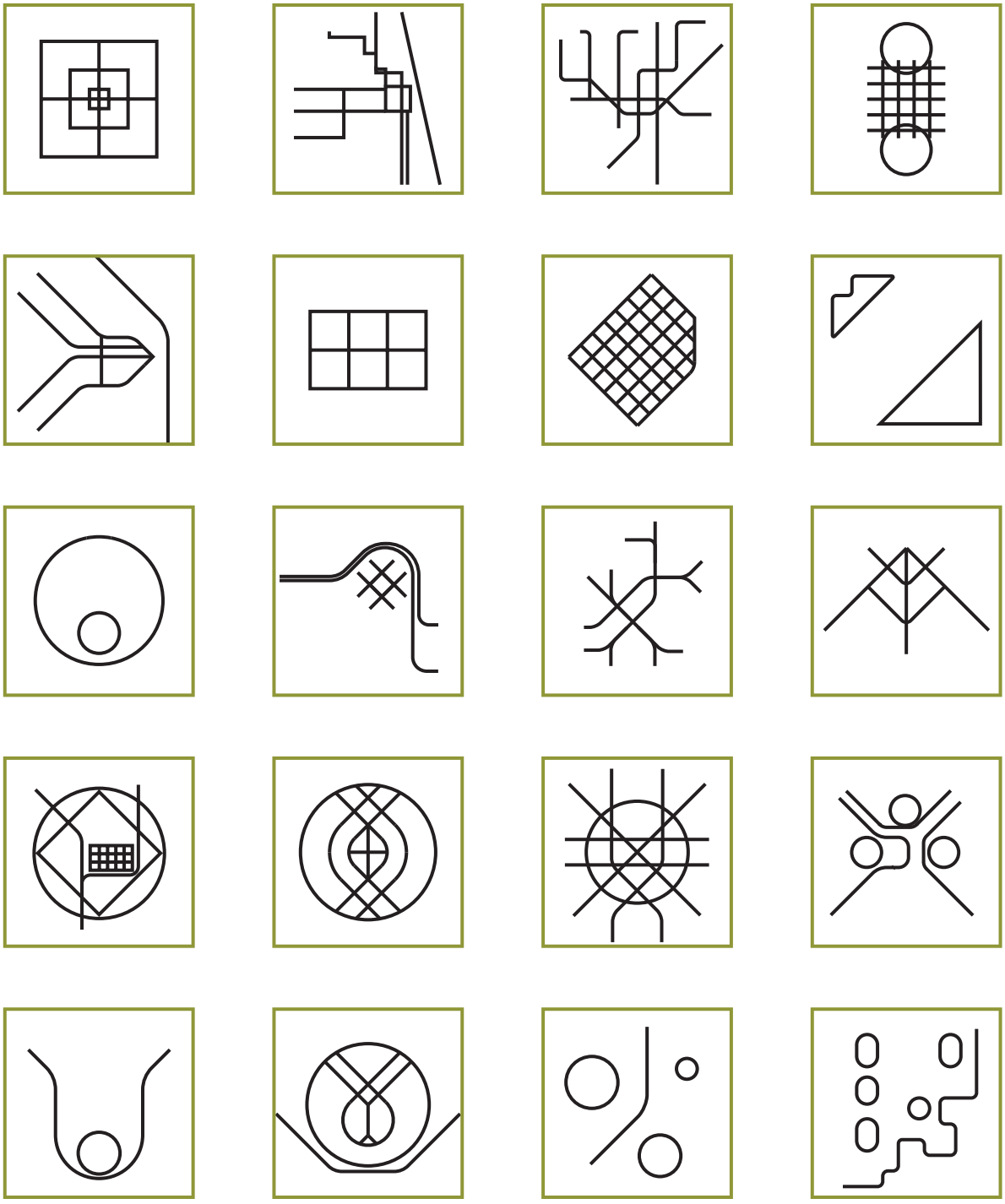
SHINJUKU

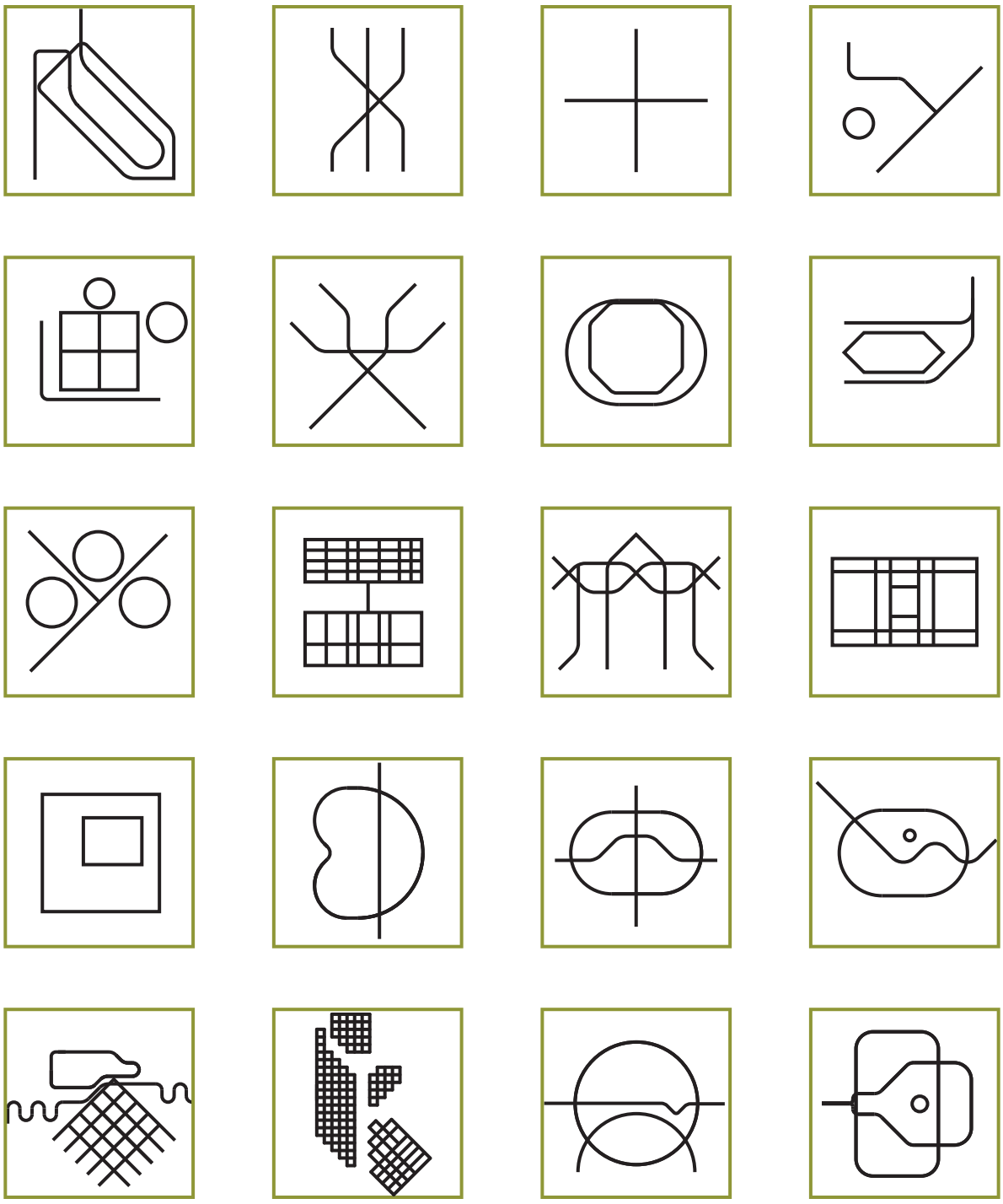


UENO

ROPPONGI

GINZA





JUG CEROVIĆ

Jug Cerović is a Serbian and French architect and mapmaker.

Born in 1982 in Belgrade, Yugoslavia, Jug Cerović studied architecture in Paris (EAPLV) and Barcelona (ETSAB). In 2008 he founded an architecture studio in Paris and has since authored more than one hundred projects, 40 of them realized.

Since 2011, curiosity and passion for cartography lead him to start mapping complex systems, especially public transport networks. He developed a personal method to create beautiful and efficient maps and his novel designs have been adopted in Seoul, Luxembourg, Utrecht and Riyadh.

A central theme in his work is the relationship between structure and beauty. He became known for a series of artworks depicting metro networks as harmonious structures anchored by symbolic shapes.

He posits that network diagrams, as works of art, are essential in shaping our mental image of a complex system. When reality proves intangible, the symbol becomes the reality.

The map is the network.

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