MEANING-FULL INFRASTRUCTURES

Polycentrism as a model for
the infrastructural development of
the Gran Colombia territories

Politecnico di Milano University
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Thesis submitted for the degree of MSc in Urban Planning
by Maria Clara Restrepo Tirado
mat. 737120

Supervisor
Prof. Arch. Massimo Novati

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ABSTRACT

Since the beginning of history, societies have imagined many settlement models, in the way of systematic structuration of territories - from cities, to regions, to nations and continents- that finally was what lead to differentiated views, life styles and cultures, that enriched the urban global panorama. But at this point of history, globalization and technological development are pushing us to the limits in where we are starting to see the edge and **the limits of the system**: the over population, the disappearing of the middle classes for the extreme separation of high and low, the holes in the ozone layer, troubles with waste and the end of the rurality. So, would be better to slow down and find alternatives before it's too late, because later, **who's going to face the guilt?** *Or sign the Kyoto protocol?*

In a Latin America of the XXI century, after 200 years of *Paper* Independence, when it seems to finally be approaching to what it might just be a real economic independence, thanks to the emergent Brazil and Mexico as super-powers, and the consolidation of less powerful but equally potential urban regions - such as *the Great Buenos Aires, The Great Santiago and the Northern Andean City (the axis Quito-Bogotá-Caracas)* - **a territorial reconfiguration,** or at least rethinking, **of the borders, towards an integration**, might just be definitive in order to get to an **equilibrium** and raising the livability on this territories.

It is well known now that the actual model of settlement , deeply rooted on the road mobility as much as the societies dependent on the private car , are not sustainable any more;
So how to dissimulate the usage of the private car as the main mobility system, and redevelop successfully alternative ones, when the economic dynamics are tending always to the lowering of prices of automobiles?

+ Is it possible to learn from territories and to interpret it's characteristics, with successes and failures, so they can be applied as a model for development in other realities - geographically, socially and politically apart?

+ Is it possible to "import" a settlement model to reconfigure an already existing and developing territory, in order to improve the life quality of it's inhabitants and to create sustainability and livability? And, Is It possible to do so through the improvement and/or establishment of mobility infrastructures?

+ Is it possible to transform the historical tendency to mono-centrism of a territory, into a poly-centric one, to reduce the socio economical gap between classes, and equilibrate the development of a region?

This thesis brings out a set of possible answers to the questions mentioned above, presented in a format that comes closer to a public debate than to a manifesto or dogma. It pretends also to light up the Northern Andean city model of settlement, who would group the collection of "spread out" cities on the Andean Axis, a region already in the maps since a while – as in the CAN or IIRSA associations*- , but without enough current information/attention, although the exponential growth of cities as Bogotá - one of the main metropolis of the continent- appearing to the eyes of an astonished international community with the .
It is also an attempt to understand and clarify concepts in a "trans-Atlantic way", longing to serve as a bridge – *or connective railway* - to overcome conceptual urban confusion when discussing about **polycentrism, integration or cooperation**, and how this *words* are used and understood in the different academic environments.

KEY WORDS/CONCEPTS
Infrastructural Development - Railway Reactivation - Territorial Reconfiguration - Integration - Equity – Competitiveness - Connectivity - Polycentrism - Transborder Cooperation - Northern Andean Territories - Northern Italy Territory - Regional Initiatives

RIASSUNTO

Sin dall'inizio della storia, le società hanno immaginato differenti modelli insediativi, intesi come regolazione sistematica del territorio – dalle città alle regioni, le nazioni, i continenti – che hanno dato luogo a precisi e contraddistinti punti di vista, stili di vita e culture, e che hanno arricchito il panorama urbano globale. L'indagine sulla la correlazione tra questi insediamenti e i flussi dalla mobilità, induce una riflessione sul "farsi della città" – e indirettamente sulla reale efficacia degli insediamenti umani, dei tradizionali strumenti di pianificazione, vista attraverso gli esempi del rapporto tra dinamiche insediative e i piani regolatori fati dai pianificatori.

A questo punto della storia inoltre, la globalizzazione e lo sviluppo tecnologico stanno progressivamente spingendo verso l'universale presa di coscienza dei limiti del sistema: la sovrappopolazione, la sostituzione della classe media con le classi ai vertici più alti e più bassi della scala sociale, il buco nell'ozono, il problema dello smaltimento dei rifiuti e la fine della *ruralità* tradizionale. Giunti a questo punto, sarebbe opportuno soffermarsi a cercare alternative efficienti prima che sia troppo tardi. Altrimenti, chi si assumerà le proprie colpe? O, chi firmerà il *protocollo di Kyoto*?

Nell'America Latina del XXI secolo, dopo ben 200 anni di Indipendenza "su carta", dove solo oggi ci si sta finalmente avvicinando a una reale indipendenza economica, sembrerebbe possibile avvicinarsi all'integrazione; Grazie non solo all'emergere di Paesi, quali Brasile e Messico, come nuove super-potenze, ma anche e parallelamente grazie al rafforzamento di regioni urbane meno potenti, ma ugualmente potenziali (come *La Grande Buenos Aires*, *La Grande Santiago* e *La Città Andina Settentrionale – sull'asse Quito-Bogotà-Caracas),* risulta oggi possibile pensare una nuova riconfigurazione territoriale dei confini, che possa raggiungere un equilibrio e innalzare i livelli di vivibilità di questi territori.

Ad oggi è infatti universalmente riconosciuto come l'attuale insediamento, profondamente radicato sulla mobilità su strada, così come la forte dipendenza della società dal mezzo privato, siano diventati modelli insostenibili. Ma, come scoraggiare l'utilizzo del mezzo privato come principale sistema di mobilità e svilupparne efficacemente uno alternativo, quando le dinamiche economiche spingono continuamente all'abbattimento dei prezzi delle automobili?

+ E' possibile imparare dai territori e apprenderne le caratteristiche intrinseche, compresi fallimenti e successi, traducendoli come modelli di sviluppo in altre realtà – geograficamente, socialmente e politicamente distanti?

+ E' possibile "importare" un modello di insediamento per ri-configurare un territorio esistente, e già orientato a un particolare modello di sviluppo, per migliorare la qualità della vita degli abitanti e raggiungere sostenibilità?

+ E' possibile trasformare la tendenza tradizionalmente storica di mono-centrismo di un territorio, verso un modello poly-centrico, così da ridurre la distanza socio economica tra le classi e riequilibrare lo sviluppo di una regione?

Questa tesi offre un set di possibili risposte agli interrogativi sollevati, presentandosi sotto forma di dibattito pubblico, stimolando alcune riflessioni piuttosto che impartendo precisi dogmi o regole. Lo studio si propone quindi di portare alla luce il modello insediativo della *Città Andina del Nord,* quale raggruppamento della costellazione di città "*disperse*" sui paesi dell' Asse Andino, regione che pur comparendo nella cartografia– CAN o IIRSA -, risulta priva di un'adeguata documentazione e di un opportuno approfondimento, nonostante la crescita esponenziale di città come Bogotà, quale metropoli tra le più importanti del continente, sia ormai sotto gli occhi attoniti delle comunità.

Questo lavoro si presenta inoltre come tentativo di comprendere e restituire al meglio la traduzione della terminologia tecnica in maniera "trans-Atlantica", fungendo da ponte - *o anche ferrovia* - per oltrepassare la confusione concettuale legata a tematiche inerenti nozioni come ***policentrismo***, **integrazione** o **cooperazione**, e accompagnando la piena comprensione e l'utilizzo appropriato di questi termini nei differenti ambienti accademici.

PAROLE CHIAVE/CONCETTI

Sviluppo Infrastrutturale; Ripristino Ferroviario; Riconfigurazione Territoriale; Integrazione; Equità; Competitività; Connettività; Policentrismo; Cooperazione Transfrontaliera; Territorio Nord Andino; Italia Settentrionale; Programmi Regionali

AXIOMATIC GEOMETRY

Euclid of Alexandria, who was a Greek mathematician, and often referred to as the "Father of Geometry", described in his book ***Elements,*** an entire theory about a geometrical system, which by the time and until de 19th Century, was the only geometry possible.

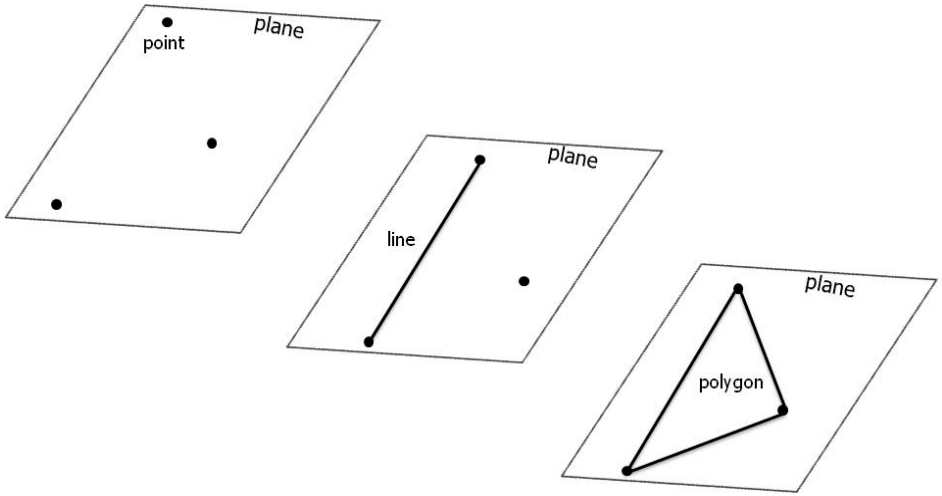
This theory is all made on ***axioms***, which are propositions that are not proved or demonstrated but considered to be either self-evident, or subject to necessary decision. Therefore, its truth is taken for granted, and serves as a starting point for deducing and inferring other (theory dependent) truths.

Unlike ***theorems***, axioms (unless redundant) cannot be derived by principles of deduction, nor are they demonstrable by mathematical proofs, simply because they are starting points; there is nothing else from which they logically follow (otherwise they would be classified as theorems).

The elements

The main and basic axioms are made of a set of *Undefined Terms* called **"Point" "Line" "Plane"**

- *Axiom I – 1. There exist at least two points.*
- *Axiom I – 2. Any two points lie on exactly one line.*
- *Axiom I – 3. For every line, there exist at least two points on that line.*
- *Axiom I – 4. For every line, there exists at least one point not on that line.*



A "**model**" is a set of points, and a set of lines, and a relation "on" which, for each given point and given line, there is either "true" or "false."

1. AXIOM 1: INFRASTRUCTURES

+ QUESTIONS

+ Some dictionary considerations

+ Some historical facts

+ A time line

+ A taxonomy of infrastructures
  + Transport Infrastructures
    + Roadway and highway networks
    + Railway networks
    + Bicycle paths
    + Pedestrian zones
    + Trans European Transport Networks

+ QUESTIONS

Is there a way to define infrastructures in a wide and also useful way?

What has been the history of infrastructures and what is the future of them?

What is the link between infrastructure development and urban development?

+ Some dictionary considerations

Infrastructure is defined as

+ An underlying base or foundation especially for an organization.

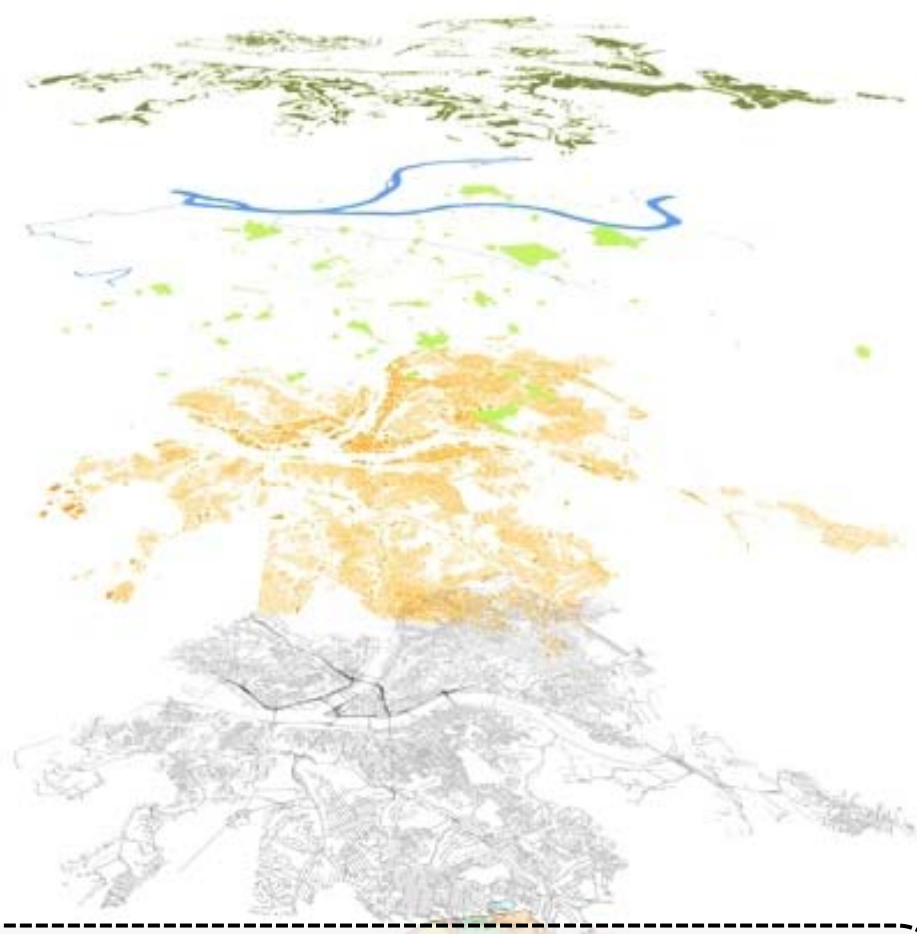
+ The basic facilities, services, and installations needed for the functioning of a community or society.

+ The fundamental architecture of any system (electronic, mechanical, social, political, etc.) that determines how it functions and how flexible it is to meet future requirements.

The term typically refers to the technical structures that support a society, such as roads, water supply, sewers, power grids, telecommunications, and others. These systems tend to be high-cost investments; however, they are needed for a country to be efficient and productive. The word also has had specific application to the permanent military installations necessary for the defense of a country, but this definition seems to be every day more and more obsolete, due to the diminishment in the military conflicts.

In the present, *infrastructure* is commonly used technically, and may refer to information technology, informal and formal channels of communication, software development tools, political and social networks, or beliefs held by members of particular groups.

The origins of the term are in the beginning of the XX century, when the construction of roads, bridges, rail lines, and similar public works became very popular, after the relevant technical developments in this constructions permitted the enlargement of networks and connections all over the *North American and European territories*, followed by the rest of the world, that quickly assimilated the idea of infrastructure's construction with economical development. The invention and spread of the use of the car also had a very important role in the popularization of the term and conceptual relation to the structures made for it.



infra (below) + structure (construction)

Origin:
1925–30

Related forms:
in·fra·struc·tur·al, adjective

Synonyms :
1. basis, foundation, support, framework.

+ Some historical facts

The history of human settlements has been outlined by the basic needs and efforts men have done to survive and evolve. All the primitive cities were articulated in order to function on a specific way, to accomplish a task, that in time became a network, and then a system.
The movement over the territories and the continuous research for water and breeding ground have also delimitated borders and all lines over the surface of the earth. The basic structures related to food, health, security, politics and believes developed around the main traces of this movements, as much in western as in eastern civilizations. The additional support structures continued to expand and made the urban stain grow up, as much as the populations, all looking out to get necessities covered, services and facilities.
The systems and services have continuously evolved in both technology and organization. Indeed, in many instances, social scientists measure the level of civilization or advancements of a society on the basis of the richness and articulation of the infrastructure systems that society has in place. The urban development is strongly linked to the infrastructure's development, to the point of saying the city evolves, when its infrastructure is improved, this not only from a technical point of view, but from a common-citizen perception of the city he lives in.

The term infrastructure entered the English language as a loan word from French in which it had been a railroad engineering term. After World War II, "infrastructure" reemerged as in-house jargon within NATO, this time referring to fixed installations necessary for the operations of armed forces and to capital investments considered necessary to secure the security of Europe. In time, the term has always suffered connotation debates: from public to private, from engineering to urban planning, but keeping politicians always hanging...

In the 1980s, following the publication of *America in Ruins* (Choate and Walter, 1981), which initiated a public-policy discussion of the nation's "infrastructure crisis", the concept of infrastructure came to prominence. That public-policy discussion was hampered by lack of a precise definition for infrastructure. A U.S. National Research Council panel sought to clarify the situation by adopting the term "public works infrastructure", referring to

"...both specific functional modes - highways, streets, roads, and bridges; mass transit; airports and airways; water supply and water resources; wastewater management; solid-waste treatment and disposal; electric power generation and transmission; telecommunications; and hazardous waste management - and the combined system these modal elements comprise. A comprehension of infrastructure spans not only these public works facilities, but also the operating procedures, management practices, and development policies that interact together with societal demand and the physical world to facilitate the transport of people and goods, provision of water for drinking and a variety of other uses, safe disposal of society's waste products, provision of energy where it is needed, and transmission of information within and between communities."

The term is part of the language spoken in several sciences such as

COMPUTERS FINANCIANCES INVESTMENTS REAL ESTATE MILITARY SCIENCES GEOGRAPHY ARCHITECTURE POLITICS ENGINEERING ENVIRONMENT PLANNING MANAGEMENT

In Keynesian economics, the word infrastructure was exclusively used to describe ***public*** *assets that facilitate production, but* ***not private*** *assets of the same purpose.*

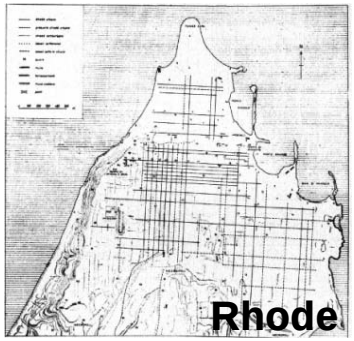
US History encyclopedia

+ A time line

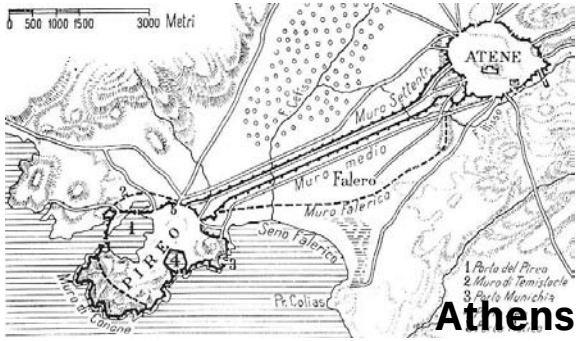
Prehistory

Classical Antiquity

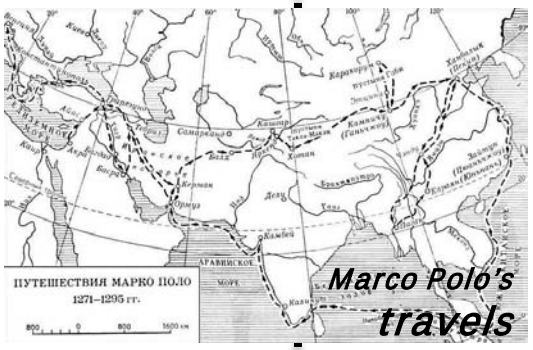
Late Classical Antiquity



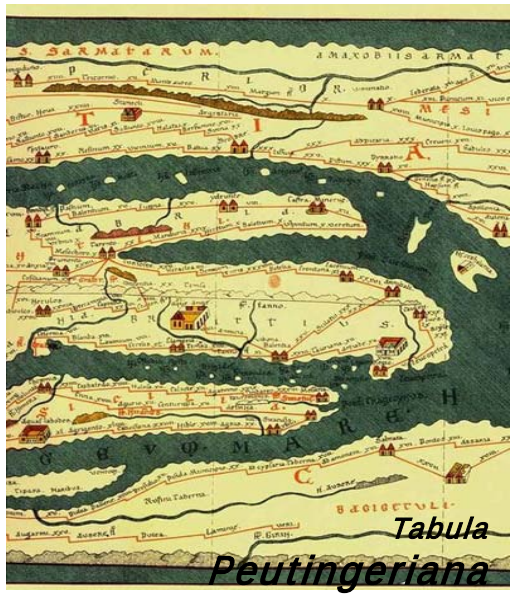
Rhode



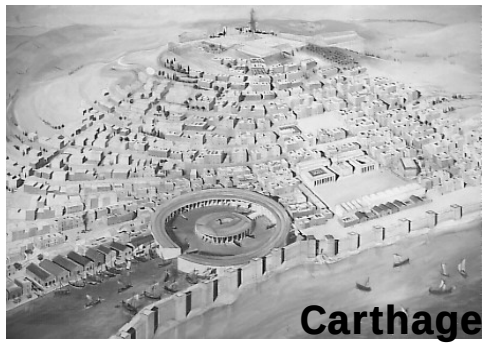
Athens



Marco Polo's travels

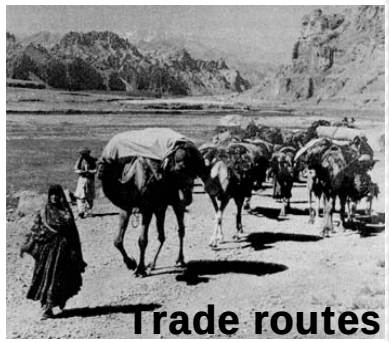


Tabula Peutingeriana

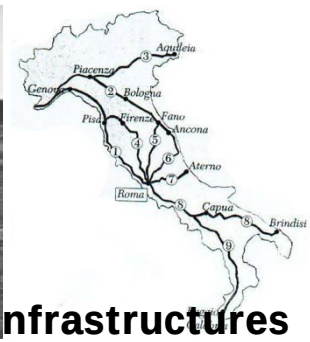


Carthage

Trapani



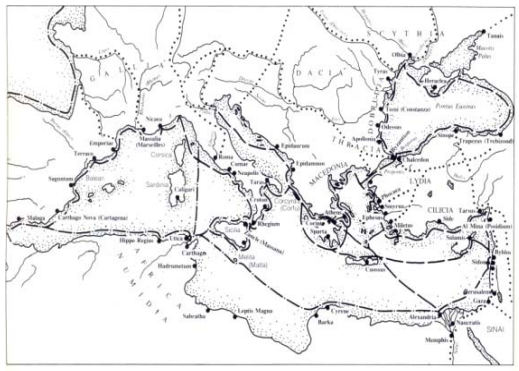
Trade routes



An empire made on infrastructures

La Via Appia e la Via Egnazia in epoca romana

Appian way



Phoenician and Greek mediterranean routes

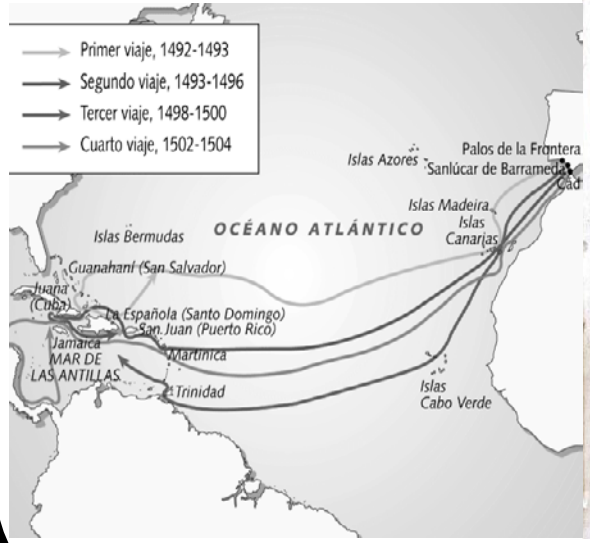
Cities, trade routes
Roads, canals
Ports, lighthouses
Aqueducts, sewers

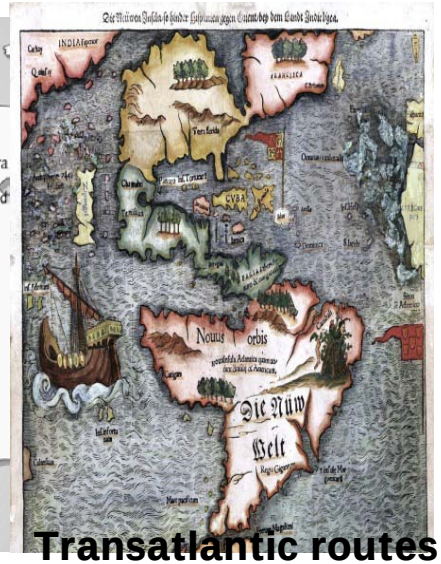
Paved streets in Ur in 4000 BC - Corduroy roads in Glastonbury – Brick paved roads in the Indus Valley - The Persian Royal Road in 500 BC - The Ancient Roman Empire road system - The Arab Empire road system of the 8th century - Natchez Trace - The canals of Mesopotamia in 4000 BC - The Egyptian canals in 2300 BC - The Grand Canal of China in 609 - Inca trails - The silk routes – The Salt routes - The spices routes - French, Italian and German canals

INFRASTRUCTURES

Andean Civilizations

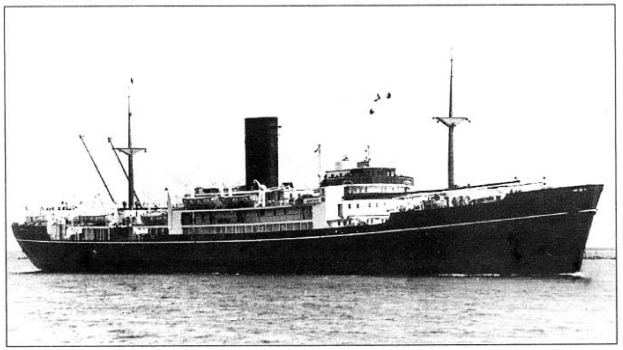
Medieval age *Prominent civilizations*

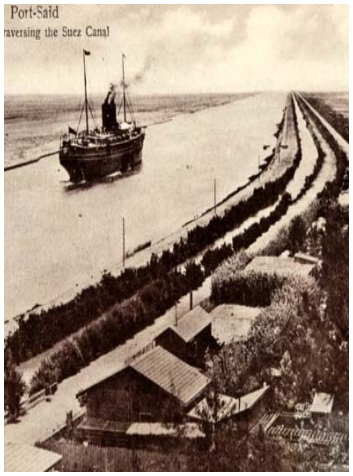


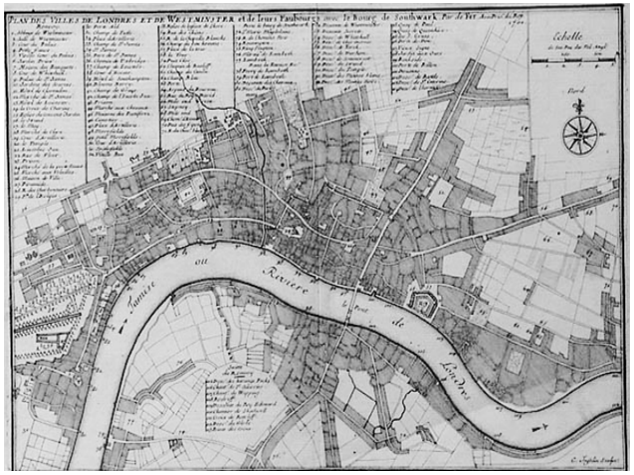


Transatlantic routes

Da Vinci's Navigli



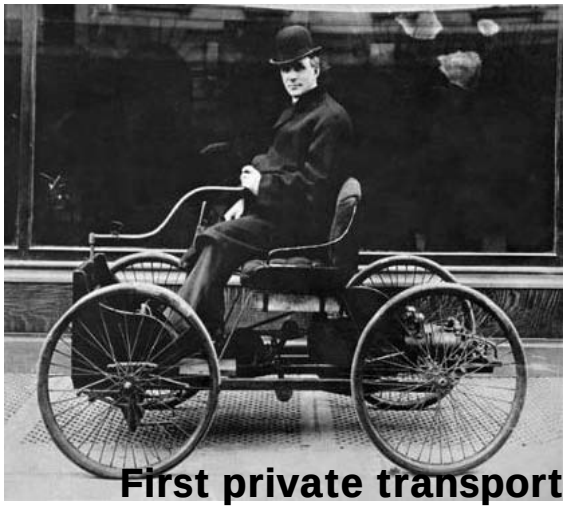




Empire ages
Trading routes
Development of Sailing and new ports

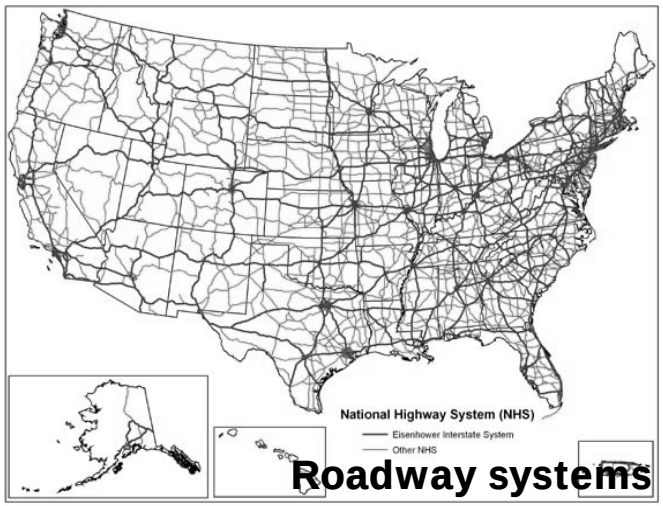
Foundation of Tenochtitlan by the Aztecan empire in 1325 and expansion of the Inca empire from Colombia to Argentina in 1460 - Invention of the printing press in 1440 - Declaration of Constantinople as capital of the Ottoman empire in 1450 - Discovery of America 1492 – Vasco da Gama arrives to India in 1500 - British colonization of South Asia, from 1660 - First macadam and concrete paving roads in Paris in 1824 -

INFRASTRUCTURES



First private transport

First steam locomotives



Roadway systems

Massive urban transport

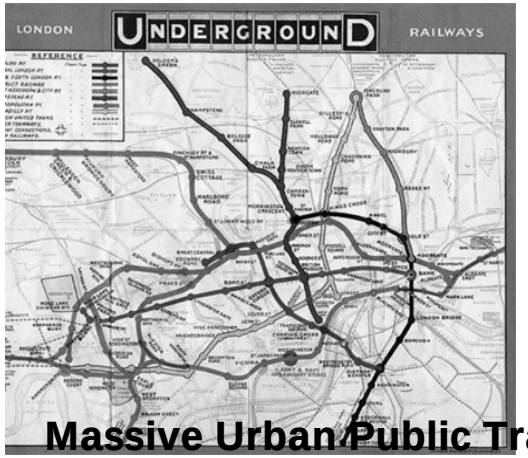
Railway systems

Development of rail transport
New mobility, cars and trains

The Liverpool and Manchester Railway 1826 - The Granite Railway Massachusetts - The Baltimore and Ohio Railway in 1830 - The first commercial electrical telegraph in 1837 - The Great Western Railway UK in 1839 - Indian Railway construction in 1853 -The first transcontinental telegraph system in 1861 - The first successful transatlantic telegraph cable in 1866 - The First transcontinental railway of the United States in 1869 - The Suez Canal in 1869 -The first telephone in 1876 – The Paris Exposition of 1878 with electric arc lighting The Kiel Canal 1895

Contemporary Age

XIX – XX – XXI centuries



Massive Urban Public Transportation systems

Alternative infrastructures

New generation – High Speed Transport

A time line +

Road ways – Highways
High speed trains
Alternatives

The Metropolitan Commission of Sewers in London in 1855 - The first municipal water 'purification' system by chlorine in 1910 by U.S. Army - The London Underground in 1890 – The panama channel in 1914 - The Autostrada dei Laghi (Milan to Lake Como) in 1925 - The US Highway 66 in 1926 - The autobahns (Frankfurt am Main to Darmstadt) in 1935 - The Golden Gate bridge in 1937 - The Pennsylvania Turnpike USA in 1940 - The Zuiderzee Works and Delta Works (The Netherlands) in 1950 - The Interstate Highway System USA in 1960 – INTERNET in 1969 - The Channel Tunnel in 1994

INFRASTRUCTURES

+ Taxonomy

Energy infrastructure

Electrical power network including generation plants, electric grid, substations and local distribution, Natural gas pipelines, storage and distribution terminals, as well as the local distribution network, Petroleum pipelines, including associated storage and distribution terminals, Steam or hot water production and distribution networks for district heating systems.

Water management infrastructure

Drinking water supply, including the system of pipes, pumps, valves, filtration and treatment equipment and meters, including buildings and structures to house the equipment, used for the collection, treatment and distribution of drinking water, Sewage collection and disposal, Drainage systems (storm sewers, ditches, etc..), Major irrigation systems (reservoirs, irrigation canals), Major flood control systems (dikes, levees, major pumping stations and floodgates).

Communications infrastructure

Telephone networks (land lines) including switching systems, Mobile phone networks, Cable television networks including receiving stations and cable distribution networks, Internet backbone, including high-speed data cables, routers and servers as well as the protocols and other basic software required for the system to function, Communication satellites

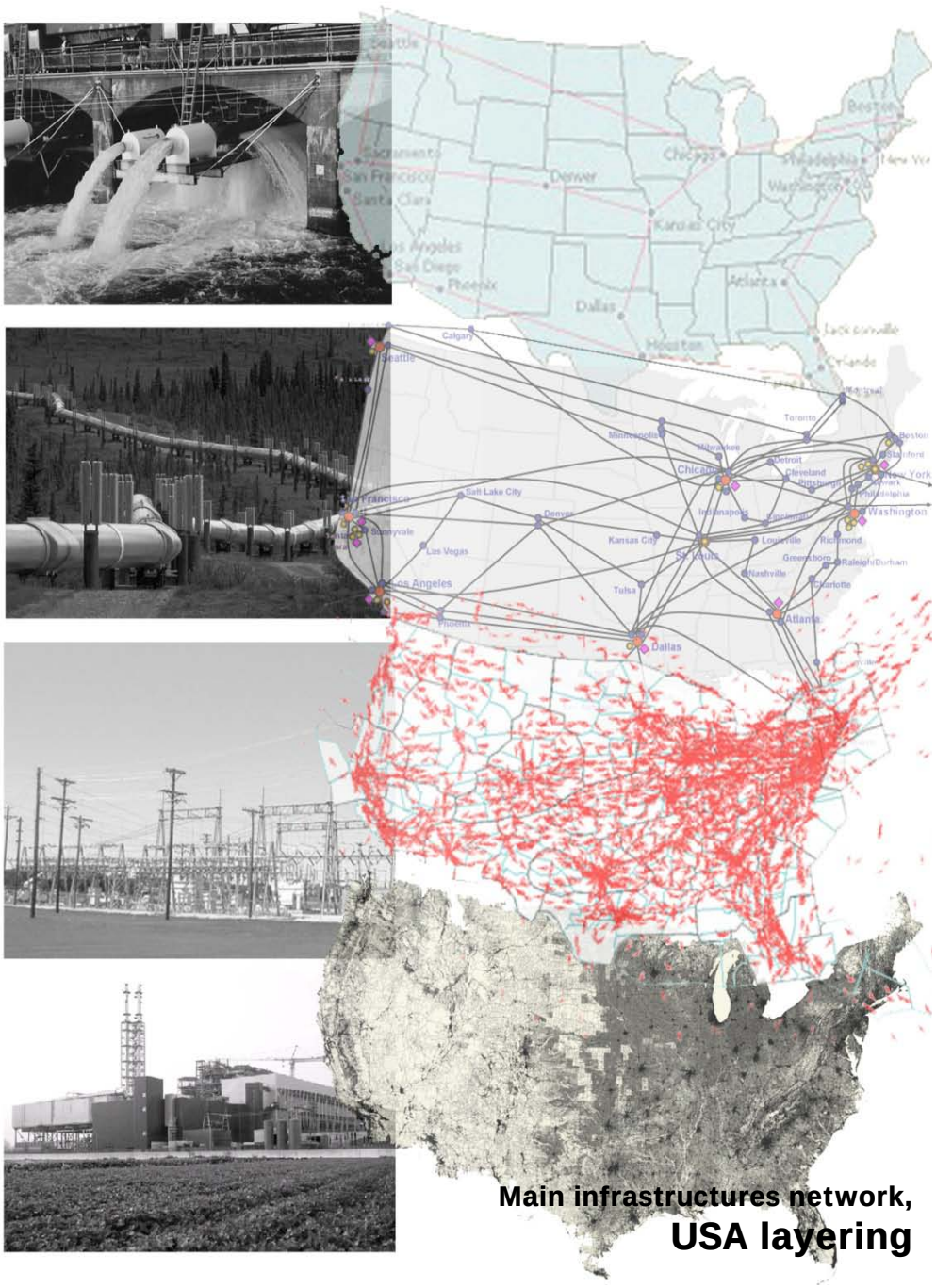
Undersea cables, Major private, government or dedicated telecommunications networks, such as those used for internal communication and monitoring by major infrastructure companies, by governments, by the military or by emergency services, Pneumatic tube mail distribution networks

Waste management facilities

Solid waste landfills, Solid waste incinerators, Hazardous waste disposal facilities

Earth monitoring and measurement networks

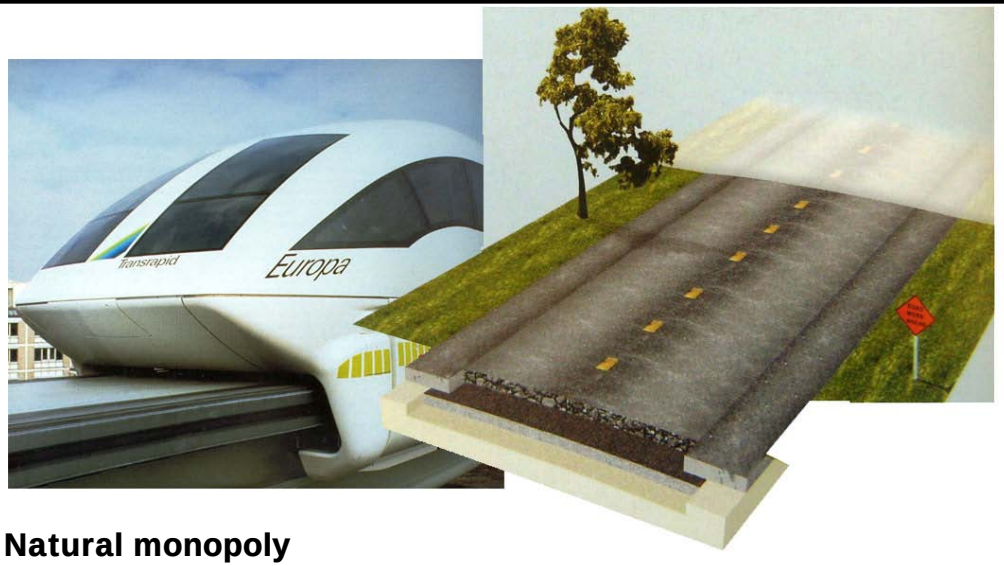
Meteorological monitoring networks, Tidal monitoring networks, Stream Gauge or fluviometric monitoring networks, Seismometer networks, Remote sensing satellites, Geodetic benchmarks, Global Positioning System



Main infrastructures network,
USA layering

+ Transport infrastructures

Transport infrastructure consists of the **fixed installations** necessary for transport, and may be roads, railways, airways, waterways, canals and pipelines, and terminals such as airports, railway stations, bus stations, warehouses, trucking terminals, refueling depots (including fueling docks and fuel stations), and seaports. Terminals may be used both for interchange of passengers and cargo and for maintenance. Vehicles traveling on these networks may include automobiles, bicycles, buses, trains, trucks, people, helicopters, and aircraft.



Capital assets that provide services

They are physical assets that provide services;

The people employed in the infrastructure sector generally maintain, monitor and operate the assets, but do not offer services to the clients or users of the infrastructure. Interactions between workers and clients are generally limited to administrative tasks concerning ordering, scheduling or billing of services.

Large networks

They are large networks constructed over generations, and are not often replaced as a whole system.

The network provides services to a geographically defined area.

The system or network has a long life because its service capacity is maintained by continual refurbishment or replacement of components as they wear out.

Historicity and interdependence

The system or network tends to evolve over time as it is continuously modified, improved, enlarged, and as various components are re-built, decommissioned or adapted to other uses.

The system components are interdependent and not usually capable of subdivision or separate disposal, and consequently are not readily disposable within the commercial marketplace.

The system interdependency may limit a component life to a lesser period than the expected life of the component itself.

Natural monopoly

The systems tend to be natural monopolies, insofar that economies of scale means that multiple agencies providing a service are less efficient than would be the case if a single agency provided the service. The assets have a high initial cost and a value that is difficult to determine.

Once most of the system is built, the marginal cost of servicing additional clients or users tends to be relatively inexpensive, and may be negligible if there is no need to increase the peak capacity or the geographical extent of the network.

Road and highway networks, including structures (bridges, tunnels, culverts, retaining walls), signage and markings, electrical systems (street lighting and traffic lights) and edge treatments (curbs, sidewalks, landscaping)

Railways, including structures, terminal facilities (rail yards, train stations), level crossings, signaling and communications systems

Canals and navigable waterways requiring continuous maintenance (dredging, etc.)

Ports ports, including dry, sea and river ports, and lighthouses

Airports, including air navigational systems

Mass transit systems (Commuter rail systems, subways, tramways, trolleys and bus terminals)

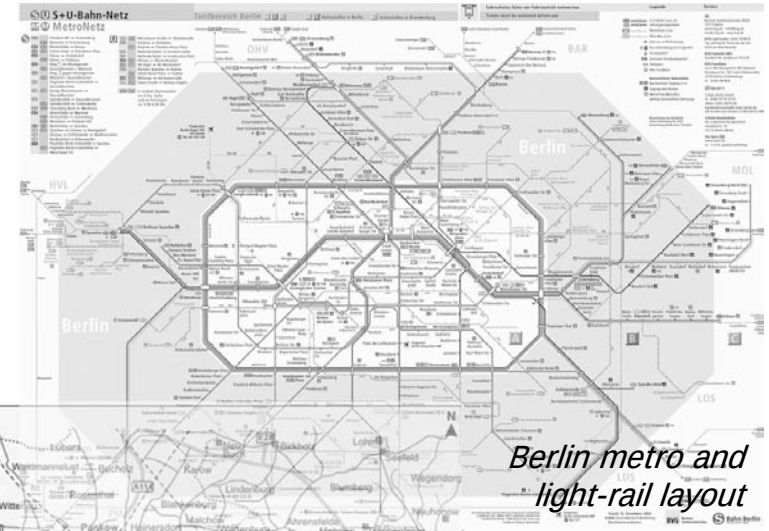
Bicycle paths

Pedestrian walkways.

+ Transport infrastructures

Road

A road is an identifiable route, way or path between two or more places. Roads are typically smoothed, paved, or otherwise prepared to allow easy travel; though they need not be, and historically many roads were simply recognizable routes without any formal construction or maintenance. In urban areas, roads may pass through a city or village and be named as streets, serving a dual function as urban space easement and route.
The most common road vehicle is the automobile; a wheeled passenger vehicle that carries its own motor. Other users of roads include buses, trucks, motorcycles, bicycles and pedestrians. As of 2002, there were 590 million automobiles worldwide.
Automobiles offer high flexibility and with low capacity, but are deemed with high energy and area use, and the main source of noise and air pollution in cities; buses allow for more efficient travel at the cost of reduced flexibility. Road transport by truck is often the initial and final stage of freight transport.



Berlin metro and light-rail layout

Berlin road layout

Rail

Rail transport is that where a train runs along a set of two parallel steel rails, known as a railway or railroad. The rails are anchored perpendicular to ties (or sleepers) of timber, concrete or steel, to maintain a consistent distance apart, or gauge. The rails and perpendicular beams are placed on a foundation made of concrete, or compressed earth and gravel in a bed of ballast. Alternative methods include monorail and maglev. A train consists of one or more connected vehicles that run on the rails. Propulsion is commonly provided by a locomotive, that hauls a series of unpowered cars, that can carry passengers or freight. The locomotive can be powered by steam, diesel or by electricity supplied by trackside systems. Alternatively, some or all the cars can be powered, known as a multiple unit.

Also, a train can be powered by horses, cables, gravity, pneumatics and gas turbines. Railed vehicles move with much less friction than rubber tires on paved roads, making trains more energy efficient, though not as efficient as ships.
Intercity trains are long-haul services connecting cities; modern high-speed rail is capable of speeds up to 350 km/h (220 mph), but this requires specially built track. Regional and commuter trains feed cities from suburbs and surrounding areas, while intra-urban transport is performed by high-capacity tramways and rapid transits, often making up the backbone of a city's public transport. Freight trains traditionally used box cars, requiring manual loading and unloading of the cargo.
Since the 1960s, container trains have become the dominant solution for general freight, while large quantities of bulk are transported by dedicated trains.

+ Roadway and highway networks

Highway/motorway/Autoroute/Autobahn/Autostrade/Autopistas

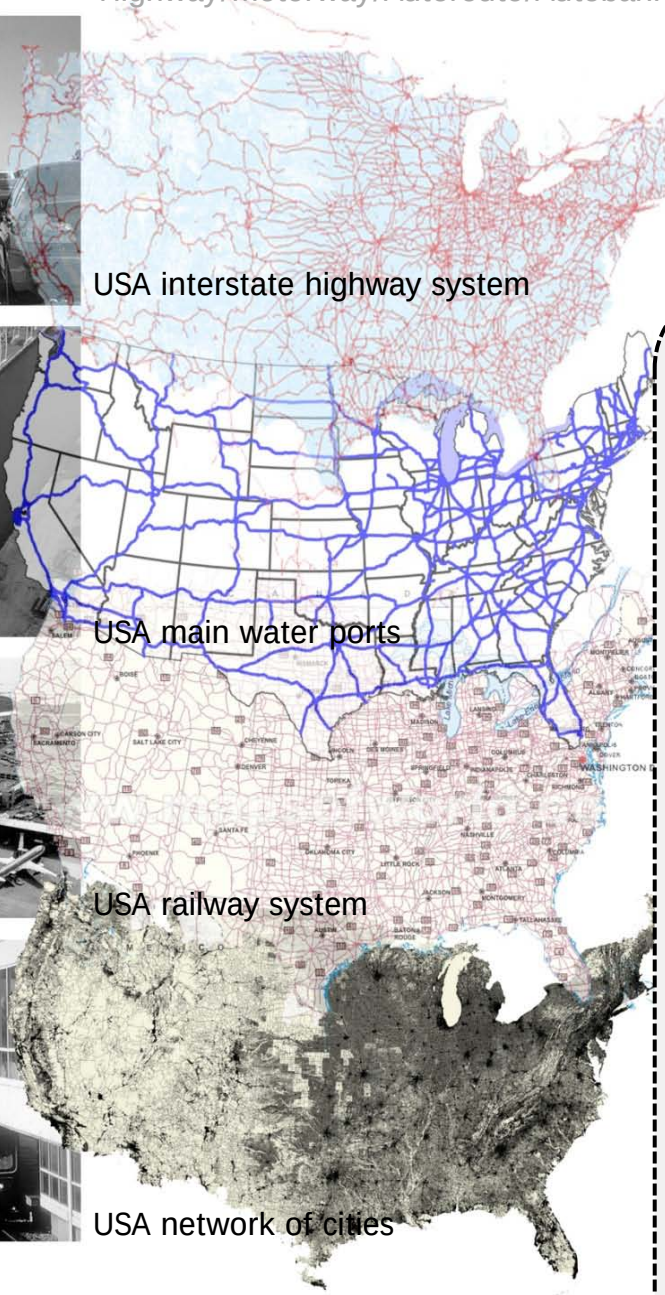
"More than any single action by the government since the end of the war, this one would change the face of America. …Its impact on the American economy - the jobs it would produce in manufacturing and construction, the rural areas it would open up - was beyond calculation.“
President Dwight D. Eisenhower

USA interstate highway system

USA main water ports

USA railway system

USA network of cities



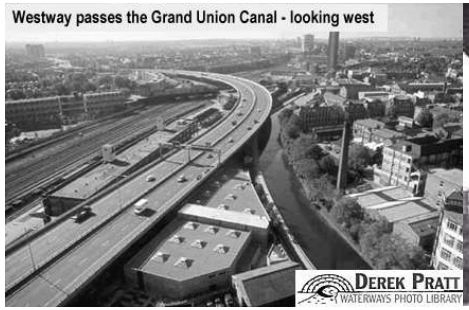
USA , INTERSTATE HIGHWAY SYSTEM

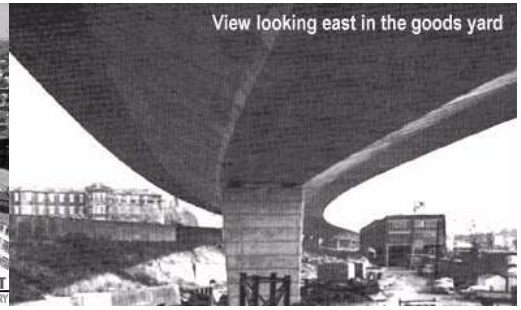
In 1956, Congress approved the Interstate Highway Act, proposed by President Eisenhower as both a ***national defense*** *program in the midst of the Cold War (permitting large-scale military units' rapid movement from one part of the country to the other) and as an* ***economic measure*** *that would increase the efficiency of the American economy. The program initially proposed 41,000 miles of expressways crisscrossing the continental United States, with an initial overall budget not to exceed $41 billion. By 1962 the program was extended to about 42,500 miles and included not only the interstate expressways but also components for all major metropolitan areas of the country. The actual plans in each case included segments connecting the suburban areas with the central business districts of each region, crosstown expressways, and one or two beltways. By the time the whole program was completed in the late 1980s, the expenditures had reached about $111 billion, making it the* ***largest single public works project in history****, far exceeding the pyramids of Egypt, the Tennessee Valley Authority multipurpose program, and the federal hydroelectric and irrigation dams program of the western states.*

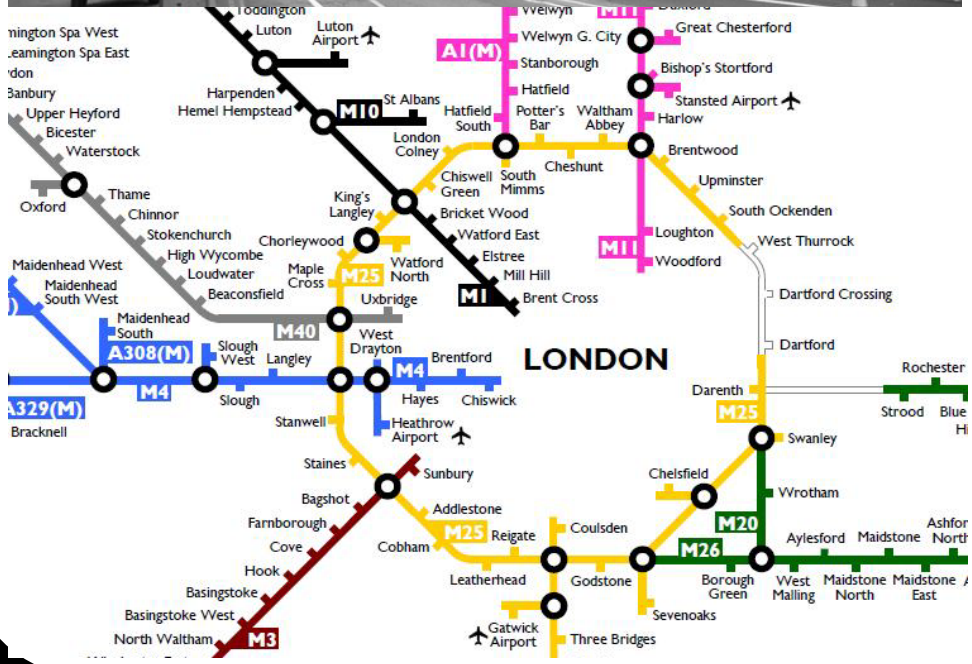
The interstate expressway system has been a major force for change in urban America, influencing national location patterns of American industry and substantially increasing the productivity and efficiency of both the primary and secondary sectors of the economy. With regard to the residential patterns of American metropolitan areas, the expressway program of the 1960s, 1970s, and 1980s contributed to the changes and upheavals of that period. Many significant mistakes have been noted on specific, localized parts of the system, due frequently to administrative directives that were very constrictive and necessitated the elimination of whole neighborhoods and/ or historical communities.

+ Roadway and highway networks

Highway/motorway/Autoroute/Autobahn/Autostrade/Autopistas







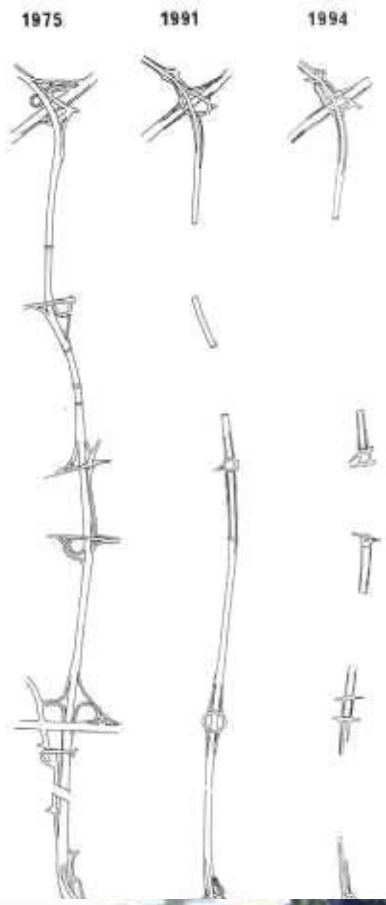
UK Motorway system
London, North Kensington Highway

Western Avenue Extension (Westway - A40(M)) is an elevated motorway 4km long, connecting the end of the existing Western Avenue (A40) at Wood Lane, adjacent to the White City Stadium, to the Marylebone Flyover at Paddington Green, and hence gives access to the Marylebone Road. It thus provides a direct link into **Central London** from the west. At the west end, the first length of the West Cross Route (M41) was constructed. This is a ground level motorway, 1km long, and runs from the interchange with Westway southwards to a ground level interchange with the existing road system at Holland Park Avenue adjacent to Shepherds Bush.

In the mid 1960s an overhead motorway, the A40, was built through North Kensington, the most northern district of the inner Royal Borough of Kensington and Chelsea. The other highways already bisecting the area were historic routes into and out of London, and communities had naturally grown up around them. Staked out on giant stilts, the motorway monolith, 'the largest continuous concrete structure in the country', now sped cars in and out of the city centre over the lives of the people of North Kensington. It brought blight, noise and disruption to a community already contending with economic hardship, a decaying inner city environment and local government neglect. As this modern engineering feat encountered North Kensington's stock of nineteenth century housing, homes were demolished, streets chopped in half or left stranded as little as twenty feet from the new raised highway, exposed to the constant noise of traffic and the nightly glare of headlights. The protests of residents of Walmer Road and Pamber Street hit the international headlines when the motorway opened in 1970. By then a decade of community action networks had grown up in North Kensington in the fight for better housing and open spaces where children could play. Energetic activists set up grass roots associations, organized on local issues and campaigned for improvements.

+ Roadway and highway networks

Highway/motorway/Autoroute/Autobahn/Autostrade/Autopistas



Autoroutes of France
Marseille, the Rocade L2

The **peripheral Rocade of Marseille L2,** or more correctly the A507, is a projected way of ring road to enclos the city of Marseille at 5km from the center of the urban agglomerate. This autoroute, is called also **the medial** because crosses through very heterogeneous tissues of the suburbs of Marseille. It consists of a 9.5 km stretch of highway, that would be partially buried as part of a very large and innovative urbanistic project, born from the affected communities that demanded the constructors to “compensate” and discuss the project before its realization. For the design of the project a multidisciplinary team were involved, to find ways to reduce the speed, create small and accessible exits from the tissues traversed and connect with the localities. However, the projects of the engineers (design of the track) and the architects (landscape project) have been made separately, and the results have disappointed: the partial silting has limited impact on the landscape, but the connections to the existing network are weak. This construction is part of a plan for relieving traffic congestion through traffic that currently overload the Rocade of Jarret (traditional link between highways north and east) and the La Rose Valentine by The Three-Lucs. In the longer term, the bypass L2 should be extended northward and southward, and represent a true peripheral ring road of Marseille, from ports as far north shore of the Red Point.

The section currently under construction is the southern route of 5.2 miles. The interchange with the radial-Vallon from downtown (Avenue Jean Paul-Sartre) is completed and also the tunnel section at Montolivet Luzy Bois, whose coverage has been a significant landscape treatment (Park Moline). The passage under the railway Marseille – Toulon and the Florian exchange are nearly complete.

Work was interrupted for nearly ten years between Fourragère and Saint-Jean du Désert because of the hostility of local residents who challenged the portion of highway open and demanded coverage, but the works were already retaken in spring 2010.

+ Railway networks

The **history of rail transport** dates back nearly 500 years and includes systems with man or horse power and rails of wood or stone. Modern rail transport systems first appeared in England in the 1820s. These systems, which made use of the steam locomotive, were the first practical forms of mechanized land transport, and they remained the primary form of mechanized land transport for the next 100 years.

Wagon ways and tramways

The earliest evidence of a wagon way, a predecessor of the railway, found so far was the 6 to 8.5 km long *Diolkos* wagon way, which transported boats across the Isthmus of Corinth in Greece since around 600 BC. Wheeled vehicles pulled by men and animals ran in grooves in limestone, which provided the track element, preventing the wagons from leaving the intended route. The Diolkos was in use for over 650 years, until at least the 1st century AD. The first horse-drawn wagon ways also appeared in ancient Greece, with others to be found on Malta and various parts of the Roman Empire, using cut-stone tracks. Railways began reappearing in Europe after the Dark Ages. The earliest known record of a railway in Europe from this period is a stained-glass window in the Minster of Freiburg im Breisgau dating from around 1350.

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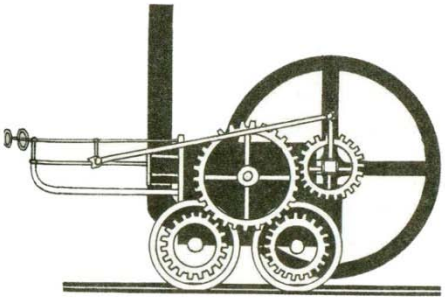
The first true railway is now suggested to have been a funicular railway made at Broseley in Shropshire at some time before 1605. This carried coal for James Clifford from his mines down to the river Severn to be loaded on to barges and carried to riverside towns. Though the first documentary record of this is later, its construction probably preceded the Wollaton Wagonway, completed in 1604, hitherto regarded as the earliest British installation. This ran from Strelley to Wollaton near Nottingham. Another early wagonway is noted onwards. Huntingdon Beaumont (who was concerned with mining at Strelley) also laid down broad wooden rails near Newcastle upon Tyne, on which a single horse could haul fifty or sixty bushels (130–150 kg) of coal.

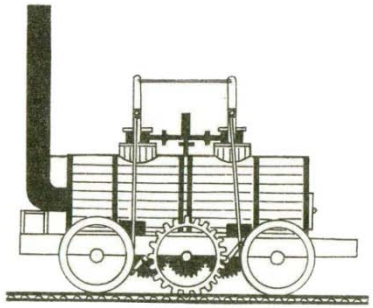
By the eighteenth century, such wagonways and tramways existed in a number of areas. Ralph Allen, for example, constructed a tramway to transport stone from a local quarry to supply the needs of the builders of the Georgian terraces of Bath. The Battle of Prestonpans, in the Jacobite Rebellion, was fought astride a wagonway.[13] This type of transport spread rapidly through the whole Tyneside coal-field, and the greatest number of lines were to be found in the coalfield near Newcastle upon Tyne, where they were known locally as wagonways. Their function in most cases was to facilitate the transport of coal in chaldron wagons from the coalpits to a staithe (a wooden pier) on the river bank, whence coal could be shipped to London by collier brigs. The wagonways were engineered so that trains of coal wagons could descend to the staith by gravity, being braked by a brakesman who would "sprag" the wheels by jamming them. Wagonways on less steep gradients could be retarded by allowing the wheels to bind on curves. As the work became more wearing on the horses, a vehicle known as a dandy wagon was introduced, in which the horse could rest on downhill stretches.

+ Railway networks

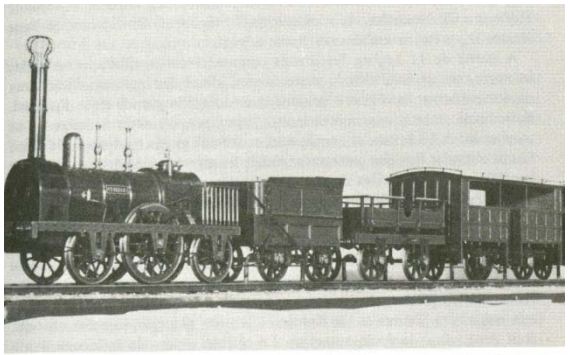
trains



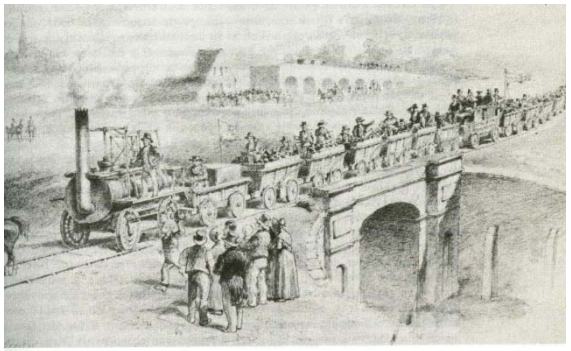
Locomotive Trevithick, 1804



Locomotive Blenkinsop 1812



L'un des premiers trains belges



Inauguration du Chemin de fer de Stochton

Train

A train is a connected series of rail vehicles that move along the track. Propulsion for the train is provided by a separate locomotive, or from individual motors in self-propelled multiple units. Most trains carry a revenue load, although non-revenue cars exist for the railway's own use, such as for maintenance-of-way purposes. The railroad engineer or engine driver controls the locomotive or other power cars, although people movers and some rapid transits are driverless.

Haulage

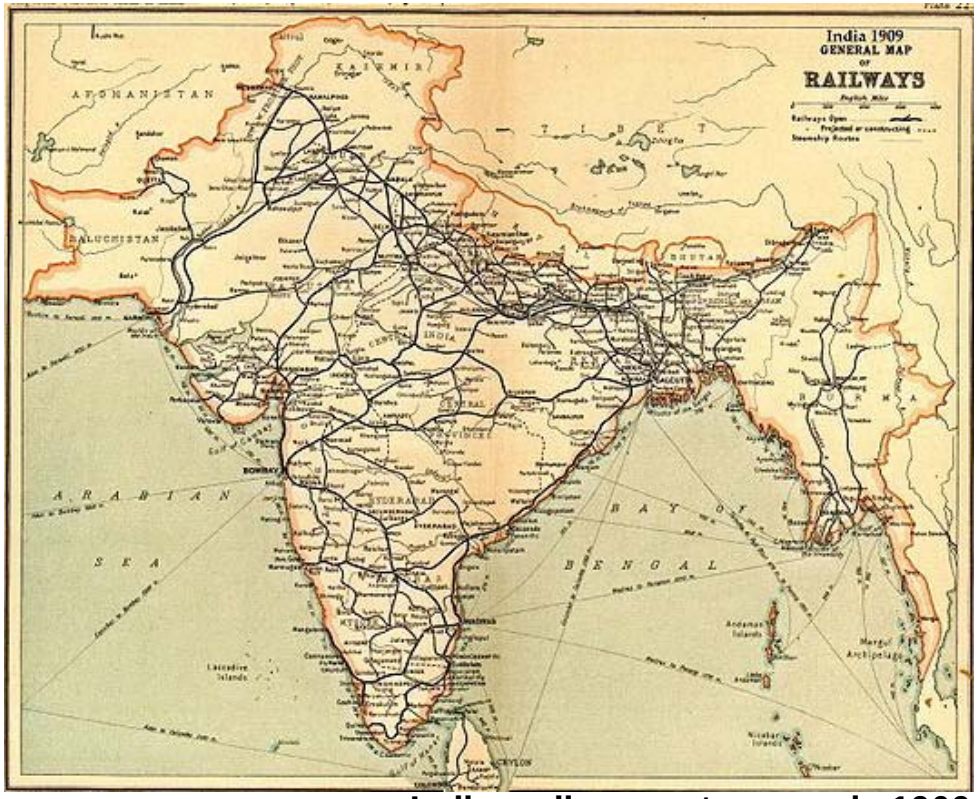
Traditionally, trains are pulled using a locomotive. This involved a single or multiple powered vehicles being located at the front of the train, and providing sufficient adhesion to haul the weight of the full train. This remains dominant for freight trains, and is often used for passenger trains. A push-pull train has the end passenger car equipped with a driver's cab so the engineer can remote-control the locomotive. This allows one of the locomotive hauled trains drawbacks to be removed, since the locomotive need not be moved to the end of the train each time the train changes direction. A railroad car is a vehicle used for the haulage of either passengers or freight.

Steam locomotives are locomotives with a steam engine that provides adhesion. Coal, petroleum, or wood is burned in a firebox. Steam locomotives have been phased out in most parts of the world for economical and safety reasons.

Electric locomotives draw power from a stationary source via overhead wire or a third rail. Some also or instead use a battery. A transformer in the locomotive converts the high voltage, low current power to low voltage, high current used in the electric motors that power the wheels. They require high capital investments both for the catenary and the supporting infrastructure. Accordingly, electric traction is used on urban systems, lines with high traffic and for high-speed rail.

Diesel locomotives use a diesel engine as the prime mover. The energy transmission may be either diesel-electric, diesel-mechanical or diesel-hydraulic, but diesel-electric is dominant. Electro-diesel locomotives are built to run as diesel-electric on unelectrified sections, and as an electric locomotive on electrified sections. Alternative methods of motive power include magnetic levitation, horse-drawn, cable, gravity, pneumatics and gas turbine.

+ Railway networks



Indian railway system map in 1909

Mumbai's Victoria Station

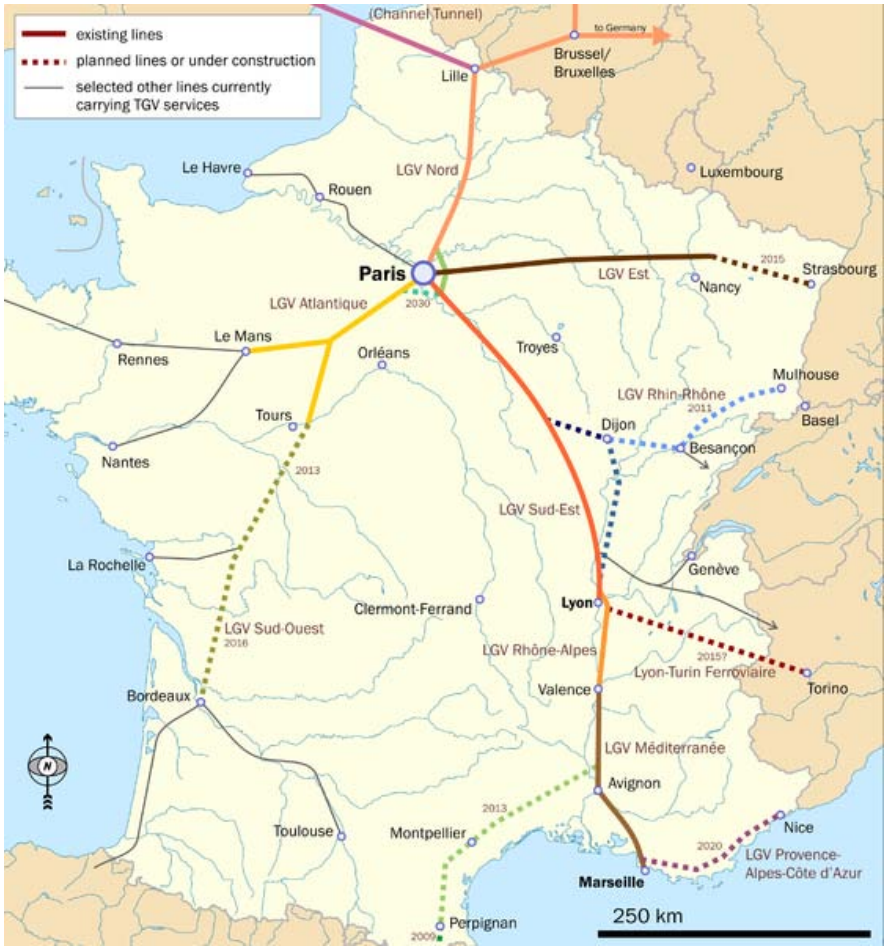
India's railways
provide an example of the British Empire pouring its money and expertise into a very well built system designed for military reasons (after the Mutiny of 1857), and with the hope that it would stimulate industry. The system was overbuilt and much too elaborate and expensive for the small amount of freight traffic it carried. However, it did capture the imagination of the Indians, who saw their railways as the symbol of an industrial modernity—but one that was not realized until a century or so later.

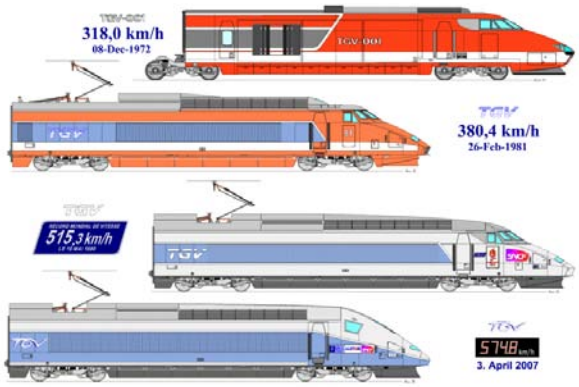
The British built a superb system in India. However, many historians consider it an 'strategy' with *colonial purpose*, to please some discontents and overcome transport needs, and even more, private interests.

By the 1940s, India had the fourth longest railway network in the world. Yet the country's industrialization was delayed until after independence in 1947 by British colonial policy. Until the 1930s, both the Indian government and the private railway companies hired only European supervisors, civil engineers, and even operating personnel, such as engine (locomotive) drivers. The government's "Stores Policy" required that bids on railway material be presented to the India Office in London, making it almost impossible for enterprises based in India to compete for orders. Likewise, the railway companies purchased most of their material in Britain, rather than in India. Although the railway maintenance workshops in India could have manufactured and repaired locomotives, the railways imported a majority of them from Britain. The Tata company built a steel mill in India before World War I but could not obtain orders for rails until the 1920s and 1930s.

In 1951 the systems were nationalized as one unit—Indian Railways—to form one of the largest networks in the world. As the economy of India improved, almost all railway production units were 'indigenised' (produced in India). By 1985, steam locomotives were phased out in favor of diesel and electric locomotives. The entire railway reservation system was streamlined with computerization between 1987 and 1995.

+ Railway networks





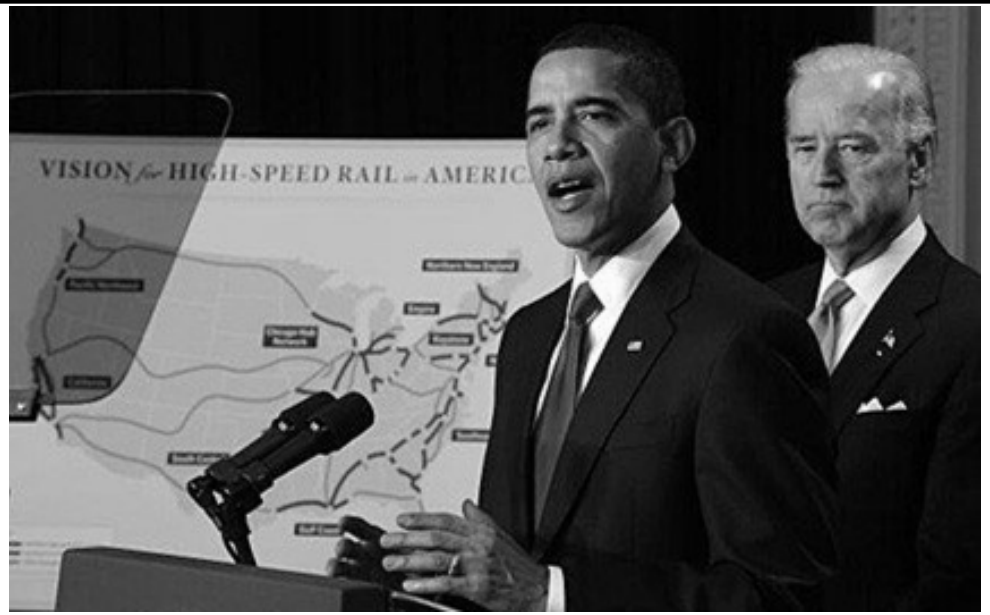
France High Speed Railway Network

The **TGV** (*Train à Grande Vitesse*: *high-speed train*) is France's high-speed rail service, currently operated by SNCF Voyages, the long-distance rail branch of SNCF, the French national rail operator. It was developed during the 1970s by GEC-Alsthom and SNCF. Although originally designed to be powered by gas turbines, the TGV prototypes evolved into electric trains. Following the inaugural TGV service between Paris and Lyon in 1981, the TGV network, **centered on Paris**, has expanded to connect cities across France and in adjacent countries. The TGV was the world's fourth commercial high speed train service and third standard gauge high speed train service after Japan's Shinkansen, which first connected Tokyo and Osaka in 1964 and Russian ER200 around 1964, and Britain's Intercity 125, intended for the UK's main lines such as the East Coast Mainline and which entered service in 1976. The TGV currently holds the world speed record for conventional, wheel/rail trains.

The success of the first line led to an expansion of the network, with new lines built in the south, west, north and east of the country. TGVs link with Switzerland through the French network, with Belgium, Germany and the Netherlands through the Thalys network, and the Eurostar network links France and Belgium with the United Kingdom. Cities such as Tours have become a part of a "TGV commuter belt".

France has around 1,700 km of *Lignes à Grande Vitesse* (LGV), with three lines under construction: the South-West: LGV Atlantique to Tours and Le Mans; the North: LGV Nord and High Speed 1 to London, with a branch towards Brussels; the East: LGV Est to Strasbourg; the South-East: LGV Sud-Est, LGV Rhône-Alpes and LGV Méditerranée to Marseille, plus LGV Rhin-Rhône and LGV Perpignan-Figueres. The LGV Interconnexion Est connects the LGV Sud-Est to the LGV Nord around Paris, and the LGV Rhin-Rhône (under construction) will connect Strasbourg and Lyon.

In 2007, SNCF generated profits of €1.1 billion (approximately US$1.75 billion or £875 million) driven largely by higher margins on the TGV network.



The New York Times

April 16, 2009.

"Obama Seeks High-Speed Rail System Across U.S."

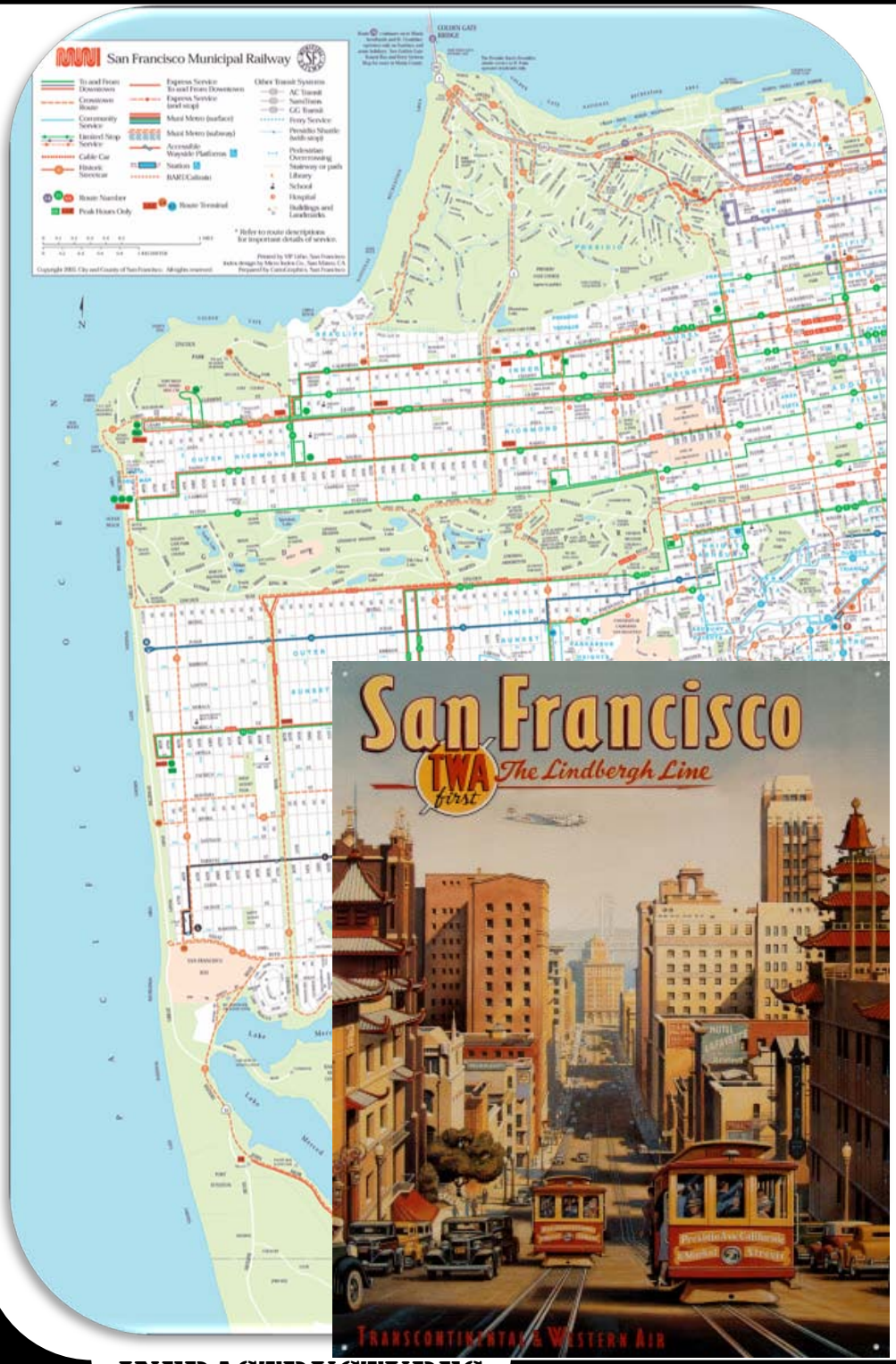
WASHINGTON — President Obama, on Thursday highlighted his ambition for the development of high-speed passenger rail lines in at least 10 regions, expressing confidence in the future of train travel even as he acknowledged that the American rail network, compared with the rest of the world's, remains a caboose. With clogged highways and overburdened airports, economic growth is suffering, Mr. Obama said at the Eisenhower Executive Office Building

"What we need, then, is a smart transportation system equal to the needs of the 21st century," he said, "a system that reduces travel times and increases mobility, a system that reduces congestion and boosts productivity, a system that reduces destructive emissions and creates jobs."

Mr. Obama said the $8 billion for high-speed rail in his stimulus package — to be spent over two years — and an additional $1 billion a year being budgeted over the next five years, would provide a "jump start" toward achieving that vision.

The government has identified 10 corridors, each from 100 to 600 miles long, with greatest promise for high-speed development.

They are: a northern New England line; an Empire line running east to west in New York State; a Keystone corridor running laterally through Pennsylvania; a major Chicago hub network; a southeast network connecting the District of Columbia to Florida and the Gulf Coast; a Gulf Coast line extending from eastern Texas to western Alabama; a corridor in central and southern Florida; a Texas-to-Oklahoma line; a California corridor where voters have already approved a line that will allow travel from San Francisco to Los Angeles in two and a half hours; and a corridor in the Pacific Northwest."



Public Transportation in the USA

Improvements in urban transportation in the last half of the twentieth century took the form of new and expanded heavy and light rail systems, an improved bus service system, and a para-transit system serving special population groups and communities. **6 heavy rail systems** were introduced in the USA (Washington, D.C., Atlanta, Baltimore, Miami, Los Angeles, and San Francisco) in addition to the four systems already in place since before World War II (New York, Chicago, Philadelphia, and Boston); **and 10 light rail systems** were introduced (Miami, Detroit, San Diego, Buffalo, Pittsburgh, Portland, Sacramento, Denver, Hoboken, and Camden-Trenton). Several other recognized **effective-public-massive-systems** also have undergone continuous expansion (San Francisco and Los Angeles, for example). In all cases the **budget and the effort** has been enormous. For example, the Washington Metropolitan Area Transit Authority took more than thirty-four years to complete its 103-mile system, which began in 1967 with a projected cost of $2.5 billion and concluded in 2001 with an actual cost of about $10 billion. At the beginning of the twenty-first century almost all major urban regions were planning major new transit systems and extensions of older ones. In Boston, the "Big Dig" of Central Avenue was expected to require more than $15 billion to accommodate all the transit and highway facilities. In the New York metropolitan region, the Regional Plan Association advanced plans that would require an expenditure of at least $20 billion in mass transit systems alone. In Philadelphia three major proposals for heavy rail would require a budget exceeding $7 billion. During this period there were vastly expanded budget revisions of the 1991 Interstate Surface Transportation Efficiency Act ($156 billion) and the 1998 Transportation Equity Act ($216 billion), but these federal funds were clearly not enough to accommodate the need for new mass transit systems projected throughout the country.

+ Bicycle paths

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Wagon ways and tramways

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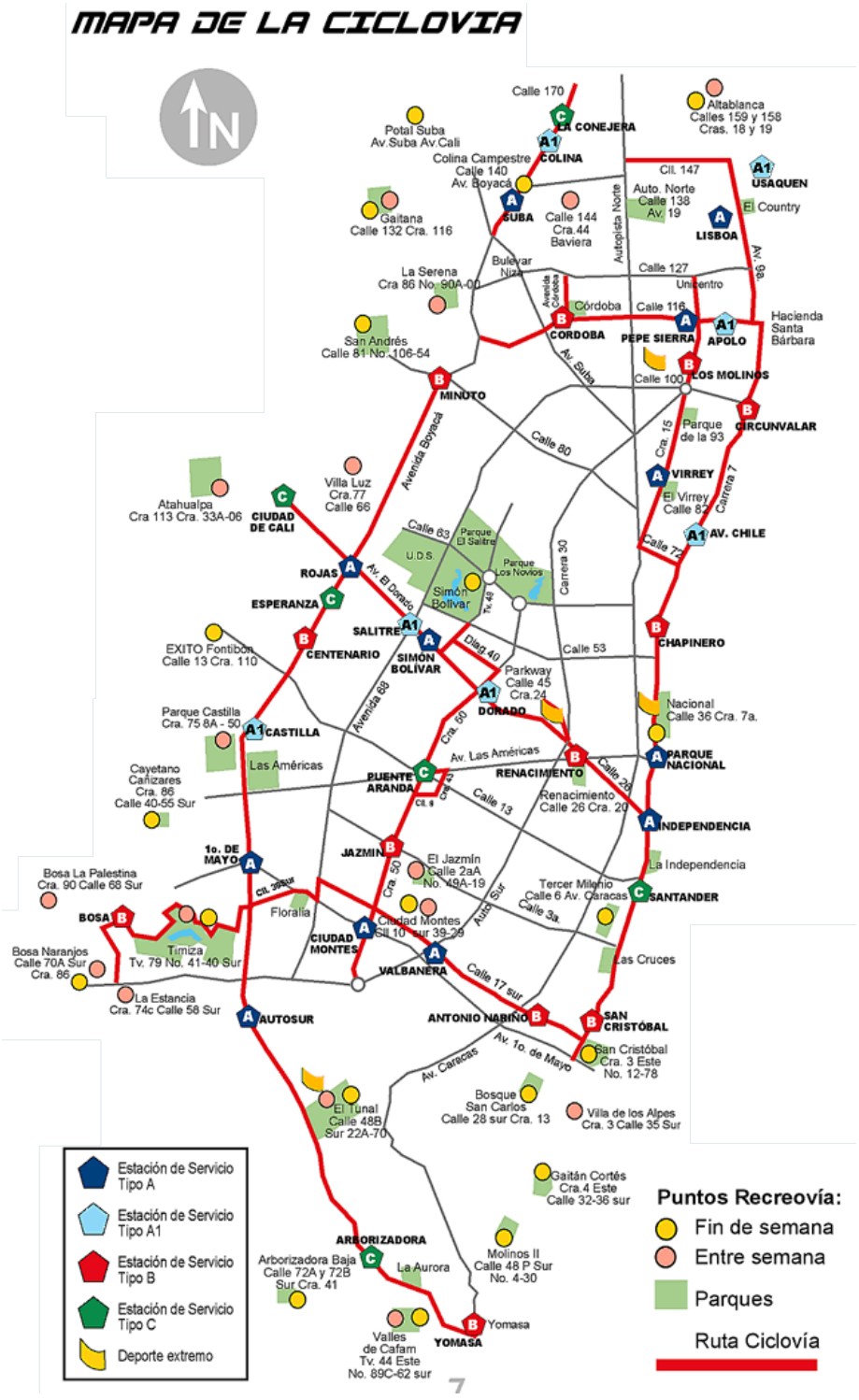
Wagonways (or '**tramways**') are thought to have developed in Germany in the 1550s to facilitate the transport of ore tubs to and from mines, utilising primitive wooden rails. Such an operation was illustrated in 1556 by Georgius Agricola. These used the 'hund' system with unflanged wheels running on wooden planks and a vertical pin on the truck fitting into the gap between the planks, to



Ciclorutas of Bogotá, Colombia

Bogotá is the South American city with the most extensive and comprehensive network of bike paths. **Bogotá's bike paths network** or *ciclorutas* in Spanish, designed and built during the administration of Mayor Enrique Peñalosa, is also one of the most extensive in the world. The design of the network was made taking into consideration the morphology and topography of the city. This is, from north to south the city has a flat topography and from east to west the city has varying degrees of inclination.

A mesh concept was applied for the theoretical plan of the network because it presented greater versatility and adaptation given that the road network was designed as a grid plan with streets going from south to north and from east to west.

Diagram to illustrate the topology of the bike paths in Bogotá. The paths follow the city's layout and its topography. From north to south (left-right in the diagram) and from the eastern mountains to the west (from top-bottom). The network was also integrated with the **Trans Milenio bus system** which has bicycle parking facilities.

Main Network: connects the main centers of the city in a direct and expeditious manner, for instance connecting the main work and education centers with the most populated residential areas, and receiving the flow from secondary networks.

Secondary Network: leads riders to the main network, it connects housing centers and attraction centres and parks with the main network.

Complementary Network: links and provides continuity to the network. It consists of additional bike paths that are required to complete the mesh system and to distribute bicycle traffic on specific areas. It includes a recreational network, local networks and a system of long green areas.

Since the construction of the ciclorutas, bicycle use has quintupled in the city, and it is estimated that there are between 300,000 and 400,000 trips made daily in Bogotá by bicycle. A large portion of this use is in southern, poorer areas.

The ciclorutas are an ongoing project. Many segments are still not connected to the main network. In some parts, they are placed on the sidewalk in a way that puts pedestrians and cyclists in competition.

+ Pedestrian zones

Also known as **auto-free zones** and **car-free zones,** are areas of a city or town reserved for pedestrian only use and in which some or all automobile traffic may be prohibited. They are instituted by communities who feel that it is desirable to have pedestrian-only areas. Converting a street or an area to pedestrian only use is called *pedestrianization*.

Pedestrian zones have a great variety of attitudes or rules towards human powered vehicles such as bicycles, inline skates, skateboards and kick scooters. Some have a total ban on anything with wheels, others ban certain categories, others segregate the human-powered wheels from foot traffic, and others still have no rules at all.

London Pedestrian Routemap

A concept (work in progress) for a user-friendly pedestrian map of London, based on a network of key routes, some existing and some with future potentials.

Project of SpaceSintax London

The first purpose-built pedestrian street in Europe was the Lijnbaan in Rotterdam opened 1953. The first pedestrianized shopping centre in the United Kingdom was in Stevenage in 1959.

A large number of European towns and cities have made part of their centers car-free since the early 1960s. These are often accompanied by car parks on the edge of the pedestrianized zone, and, in the larger cases, park and ride schemes. Central Copenhagen is one of the largest and oldest examples: the pedestrian zone is centered on Strøge, a pedestrian shopping street, which is in fact not a single street but a series of interconnected avenues which create a very large pedestrian zone, although it is crossed in places by streets with vehicular traffic. Most of these zones allow delivery trucks to service the businesses located there during the early morning, and street-cleaning vehicles will usually go through these streets after most shops have closed for the night.

There are many towns and cities in Europe which have never allowed motor vehicles. The archetypal example is Venice, which occupies a myriad of islands in a lagoon, divided by and accessed from canals. Motor traffic stops at the car park at the head of the viaduct from the mainland, and water transport or walking takes over from there. However, motor vehicles are allowed on the Lido. Other examples are Cinque Terre in Italy, Ghent in Belgium, which is one of the largest car-free areas in Europe and the Old Town of Rhodes, since many, if not most of the streets are too steep and/or narrow for automobile circulation. Mount Athos, an Autonomous Monastic State within the sovereignty of Greece, does not permit automobiles on its territory. Trucks and work-related vehicles only are in use there. The medieval city of Medina in Malta does not allow automobiles past the city walls. It is known as the "Silent City" because of the absence of motor traffic in the city. Sark, an island in the English Channel is a car-free zone where only bicycles, carriages and tractors are used as transportation.

+ Trans European Transport Networks

TEN-T

The **Trans-European Networks** (**TEN**) were created by the European Union in 1957, with the stated goals of the creation of an internal market and the reinforcement of economic and social cohesion. To various supporters of this policy, it made little sense to talk of a big EU market, with freedom of movement within it for goods, persons and services, unless the various regions and national networks making up that market were properly linked by **modern and efficient infrastructure**. The construction of Trans-European Networks was also seen as an important element for economic growth and the creation of employment.

The Treaty Establishing the European Community first provided a legal basis for the TENs. Under the terms of Chapter XV of the Treaty (Articles 154, 155 and 156), the European Union must aim to promote the development of Trans-European Networks as a key element for the creation of the Internal Market and the reinforcement of **Economic and Social Cohesion**. This development includes the interconnection and interoperability of national networks as well as access to such networks. According with these objectives, the European Commission developed guidelines covering the **objectives, priorities, identification of projects of common interest and broad lines of measures** for the three sectors concerned (Transports, Energy and Telecommunications). The European Parliament and the Council approved these guidelines after consultation with the Economic and Social Committee and the Committee of the Regions.

Many projects of common interest have been financed by the TEN-budget line, as well as the **Structural Funds, Cohesion Fund** and the European Investment Bank loans.

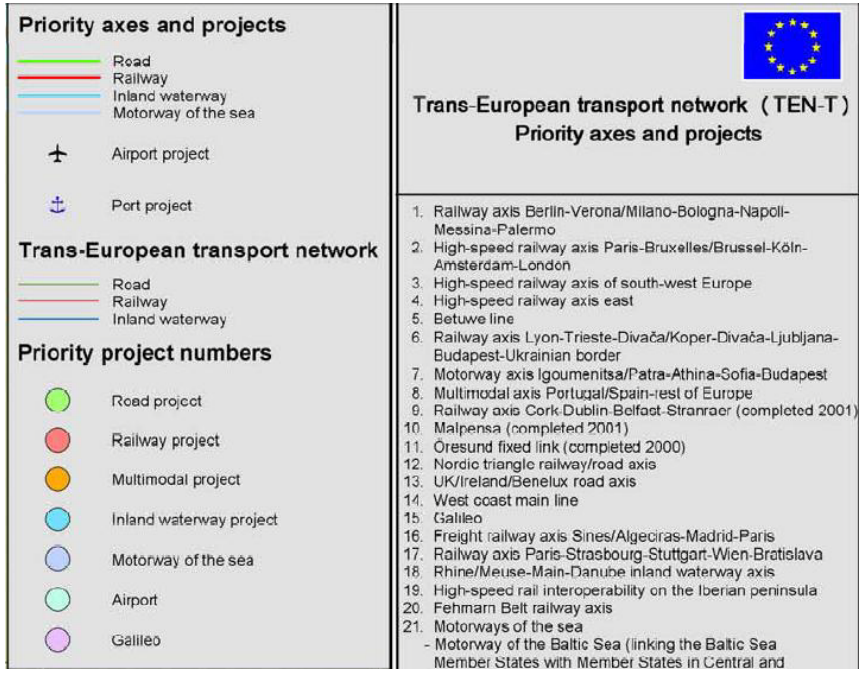
Three classes of network were defined by the treaty:

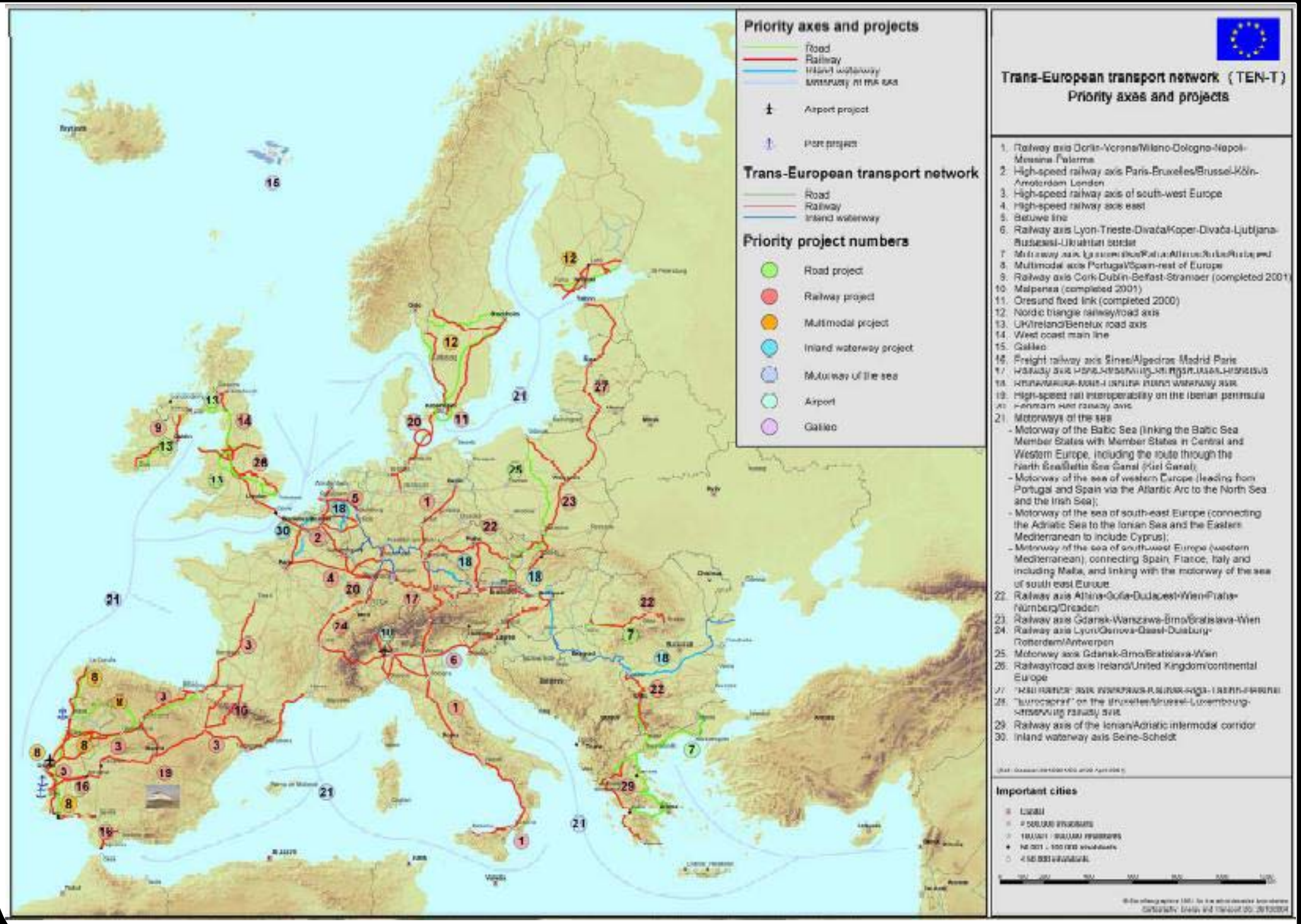
Trans-European transport networks (TEN-T)
Trans-European Energy Network (TEN-E or TEN-Energy)
Trans-European telecommunications network (eTEN)

The **Trans-European Transport Networks** are a planned set of road, rail, air and water transport networks designed to serve the entire continent of Europe. TEN-T envisages coordinated improvements to primary roads, railways, inland waterways, airports, seaports, inland ports and traffic management systems, so as to provide integrated and intermodal long-distance high-speed routes for the movement of people and freight throughout Europe

These projects are technically and financially managed by the Trans-European Transport Network Executive Agency (TEN-T EA), which was established exactly for this purpose by the European Commission in October 2006.

At its meeting in Essen in 1994, the European Council endorsed a list of 14 TEN-T 'specific' projects, drawn up by a group chaired by then Commission Vice-President H. Christophersen, following the recommendations of 2003 from the *Van Miert high-level group* on the TEN-T, the Commission compiled a new list of 30 priority projects to be launched before 2010.





The TEN T priority projects, by 2004.

2. AXIOM 2: SETTLEMENTS

+ QUESTIONS

+ Some dictionary considerations

+ Urban Genesis

+ Forms of Urban Genesis: Utopias, anti-utopias, ideal cities

+ Phenomena and contemporary cities

+ Urban Morphology

+ About urban models: centrism and polycentrism

+ QUESTIONS

What does the urban form responds to?

What makes a city change?

Which where the phenomena that gave birth to the contemporary city?

Is it possible to group cities?

+ Some dictionary considerations

For the common vocabularies, Settlement is defined as:

n. The act or process of settling: as the establishment, of a person in a business or of people in a new region, or a newly colonized region.
A small community.
An arrangement, adjustment, or other understanding reached, as in financial or business proceedings: *a divorce settlement (Law*: Transfer of property to provide for the future needs of a person, property thus transferred.
A center providing community services in an underprivileged area. Also called *settlement house*.

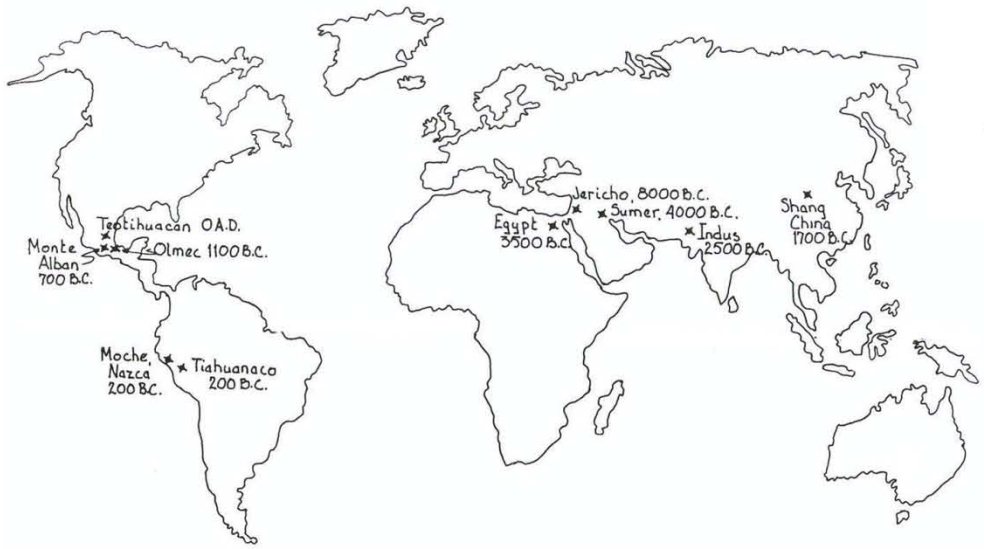
A **settlement** is a general term used in archaeology, geography, landscape history and other subjects for a permanent or temporary community in which people live, without being specific as to size, population or importance. A settlement can therefore range in size from a small number of dwellings grouped together to the largest of cities with surrounding urbanized areas. The term may include hamlets, villages, towns and cities. A UK schools curriculum requires 12-year-old pupils to understand and define the term.
A settlement conventionally includes its constructed facilities such as roads, enclosures, field systems, boundary banks and ditches, ponds, parks and woods, mills, manor houses, moats and churches.
Settlements can be ordered by size or other factors to define a settlement hierarchy.
Landscape history studies the form (morphology) of settlements – for example whether they are dispersed or nucleated.

In human geography: any form of human habitation from a single house to the largest city
Geography Dictionary

Settlement term Origin:
In the **Elizabethan Poor Laws,** more exactly on the Settlement Act of 1662, for the first time, the ‘poor’ had to prove a 'settlement‘, as the place of birth or spent life time, in order to belong and gain access to Relief from that parish.

Synonyms :
1. Consolidation, closure.
2. Colony, village, town, city.

+ Urban Genesis



Kevin Lynch's Good City Form

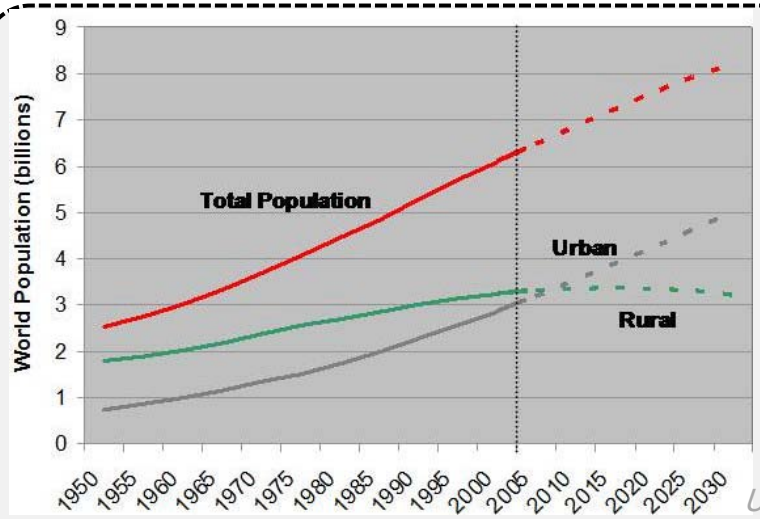
The known or possible locations where cities appeared independently.

http://www.citymayors.com

Global distribution of top 400 "urban areas" with at least 1,000,000 inhabitants in 2006.

Area/zone/region
urban/built up/stain/city

Today, to define a city is as difficult as it is useless, given the fact that is the more complex human creation and it would take a lifetime to find a set of words to sum up all the values inherent to a contemporary city, and even then it would have already changed from what it was at the moment the research started.
Although, in order to understand our environment it is necessary to find a common notion of what we talk about when trying to find the best way to live, and given the fact that at this point of human history, more than half of us live in cities or urban environments, it is accurate to find a starting point. Its during the trip of finding the right concepts to define a city, that we decide what is it that makes the good, the bad and the ugly of urban vocabulary, and then potentiality, because it's impossible not to fall into dreaming of a future when thinking of images, specially for planners.



UN database 2009

In 2007 for the first time more people lived in urban than in rural areas

+ Urban Genesis

According to Kevin Lynch's functional theory (him self calls it an "endeavor to explain the city as an spatial phenomenon") one way to define what a settlement is, is by understanding why cities take the form they do, and how this forms work. This theory studies a static city, one that is not under the, normal and general, process of change, in a formal way, standing on ***What a city Is***, to get to ***What a city will be*** and ***What a city should be.***

So in his "abbreviated catalogue" of theories of city genesis and function, Lynch ties a variety of metaphors, according to the "images and ideas" created by plenty of **city-students and scientifics,** whom are inserted in one of the ranges of ways of defining the city.

+ Cities are unique historical processes

A city has to be understood as a story, as a long chain of individual events, that makes them unique. Different cities might have some elements in common, but even it's significance in each territory and society is linked to culture and leads to different interpretations.

This view is strongly linked to sciences like archeology and sociology. But when we get to the point in which cities need to be able to learn from each other and other territorial experiences, even very different, the fact is that most of the times they have more in common than is thought and are not so "lonely unique".

+ Cities are ecosystems of human groups

This theoreticals were the first in talking about Urban Ecology (Park and Burgess, and then the Chicago school) They understood the city zoned by economical activities. The flows and changes are understood in terms of statistics, groups and patches. Through a very empirical research, they got to individualize patterns of development and shapes common to more than one city at the time. This theory is consider to be ahistorical and sometimes merely stetical, but becomes a useful analysis in a local scale to understand some urbanities.

+ Cities are spaces for the production and distribution of material goods

The mixing of patterns, given by activities in space facilitate the appearance of economies. For this theories the space is a resource, but also has a cost for transportation through out the city borders. In regional and national scales, from this economical point of view the cities are market towns with centers that configure hexagons that fit into each other as patterns of productive location. Although, within the city, this patterns are more difficult to draw but in an attempt to explain, the theory of Rent and Access, one single centre has the higher rent and its peripheries are expressed in terms of lower rents. These spatial economic theories are basically static and escape far away from reality when thinking of urban space as an empty container, affording room and imposing transportation costs. This explanations of cities neglect values such as production of domestic goods, culture or even children**.**

+ Cities are fields of force

This theory makes a comparison to electromagnetical or gravitational fields of force, in which particles (human beings) move and distribute in space, communicate, attract and repel with each other, so city becomes a communication network. Flows, movements and effects on others are the basic communicative links between particles. There are even mathematic models that explain human behavior and try to predict communications. The model is dynamic but the particles are forgotten to have a will, are static. That's why the model is considered narrow, and that disregards human capacity of learning, which is the fundamental reason for human settlement.

+ Urban Genesis

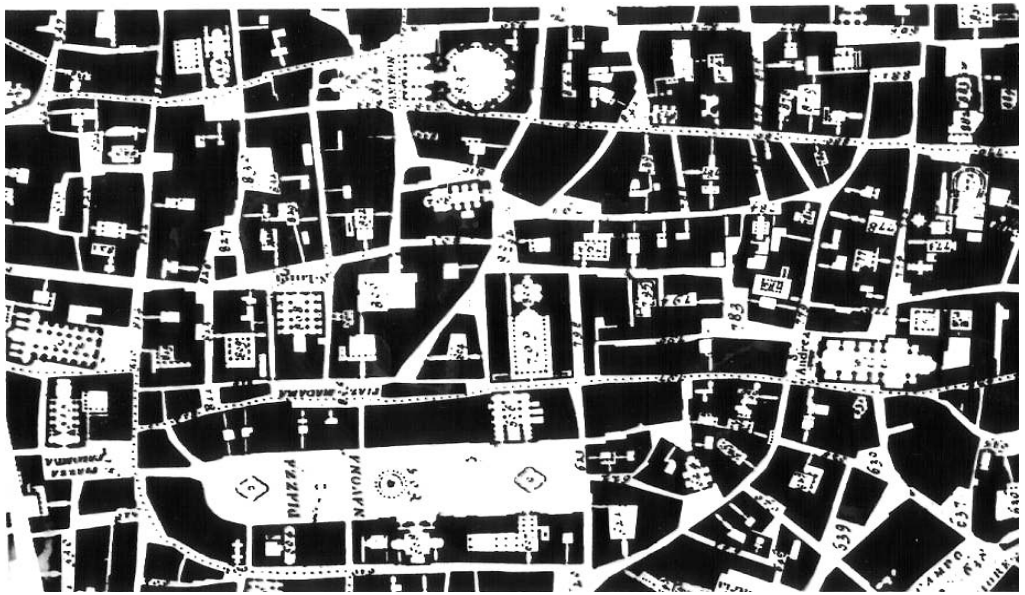
+ Cities are systems of linked decisions

The cities are made of actors, who having divers roles and resources, take decisions, and interact. The simple accumulation of them, shape settlements and form complex systems. There are basically actions or decisions, and links between them that flow, and work as a machine. The city shows then specific paths of interrelation and sequential timing. This model gets to be very subjective, because of the long list of assumptions that have to be made in order to understand, for example the different roles and decisions the actors take. Plurality and multiple decisions though are strongly determinants of the city's evolution.

+ Cities are arenas of conflict

For this theory the city form is the residue and the sign of conflict. More than an engine the city becomes a weapon, used to defend from outside attackers or as the embodiment of the struggle from the inside, as in the case of the classes struggle of the Marxist city. The morphologies of the cities then are outcomes of this historical conflicts, opponents, domination, control, and at the end, power.

"Almost all recent theories about spatial form of urban settlements have been theories of urban function. They ask, "How did the city get to be the way it is?", and a closely related question "How does it work?". One cannot ask "What is a good city?" without some convictions about answers to those previous questions."
K. Lynch, Good City Form.



The Cambridge English Dictionary defines 'city' as 'a large town' or 'any town in the UK which has a cathedral'. This is the common meaning of the word throughout the world, and in most countries the size of a town is the deciding factor over whether it has city status. Large towns are automatically considered cities. This is perfectly logical and sensible, however this is not the case in the UK.

Despite having a parliamentary democracy, many decisions within the UK are not open to the public, but instead controlled by the monarchy or parts of the British government which answer to the monarchy, irrespective of which political party is in office. The decision to grant a town city status is one such decision. Hence in the UK city status is not granted automatically just because a town becomes very large, or because of a cathedral. A town must be granted city status by the British monarch.

According to the part of the British government known as the Department for Constitutional Affairs:

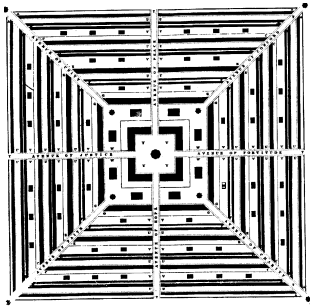
"City status is a rare mark of distinction granted by the Sovereign and conferred by Letters Patent. It is granted by personal Command of The Queen, on the advice of Her Ministers. It is for Her Majesty The Queen to decide when a competition for city status should be held. Competitions are usually held on occasions such as important Royal anniversaries."

Because of this peculiarity there is a discrepancy between the common meaning of the word 'city' and the 'official' meaning.
UK cities publication.

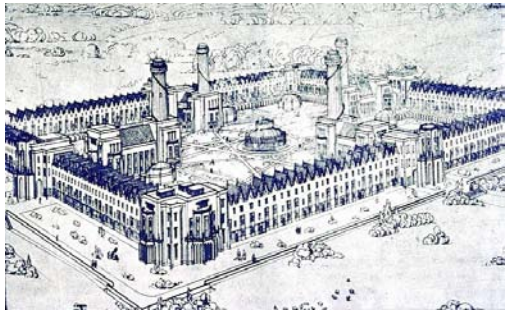
+ Forms of Urban Genesis

Utopias, anti-utopias, ideal cities

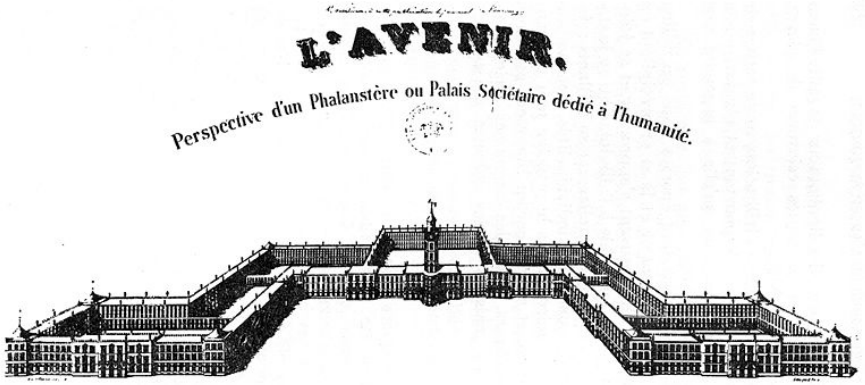
The idea of city we have –and live in- today, there's no doubt, it's a **mixed-post-after** of what lots of architects, planners, governments, city-students, and at the end citizens, made it to be.
As a way to understand the story and why did cities got to have the shapes they do now, and why do we urban people have the life styles we do now, we certainly have to get to know the people who before us dreamed, and dare to make public their ideal, in a very risky and brave (also a little egocentric) act of writing down, drawing and sometimes experimenting, successful or not, to propose shapes, ways and then, cities.



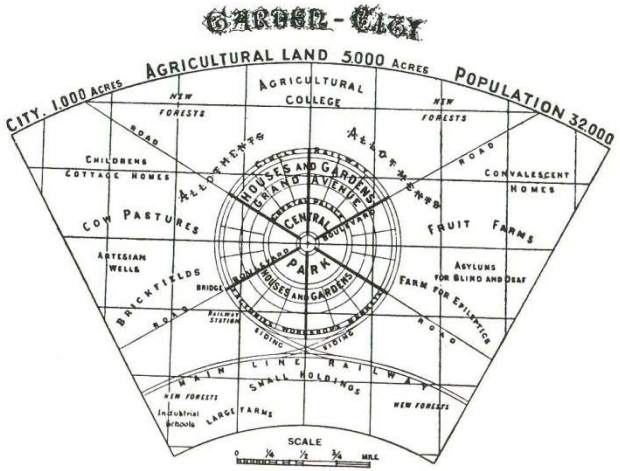
J. S. Buckingham
Plan of the model town, 1849



R. Owen
New Harmony, 1825

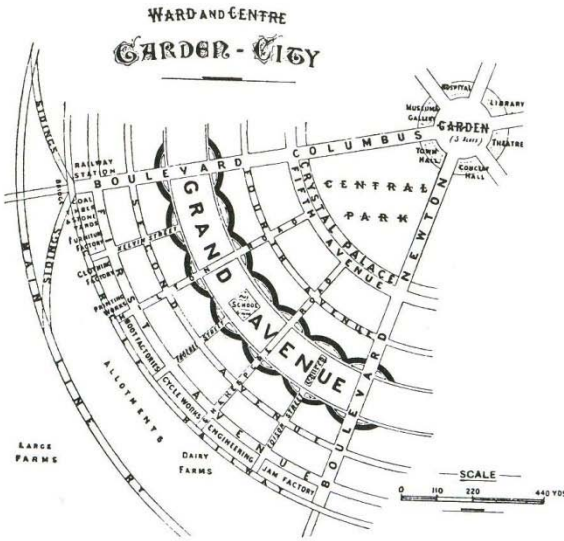


C. Fourier
Phalanstery, 1800?



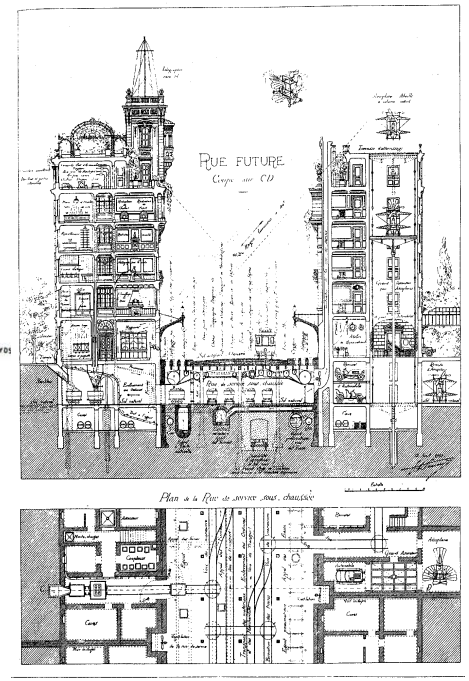
" ... The first would leave the great towns still existing, but would limit the population on any given space; it would insist on cleanliness and airiness, the surrounding and segregation of the houses by gardens; the erecting of novel public buildings..."

W. Morris
News from nowhere, 1890



"...Those who have had experience of the difficulty of getting from one suburb of London to another will see in a moment what an enormous advantage those who dwell in such a group of cities as here shown would enjoy, because they would have a railway system and not a railway chaos to serve their ends."

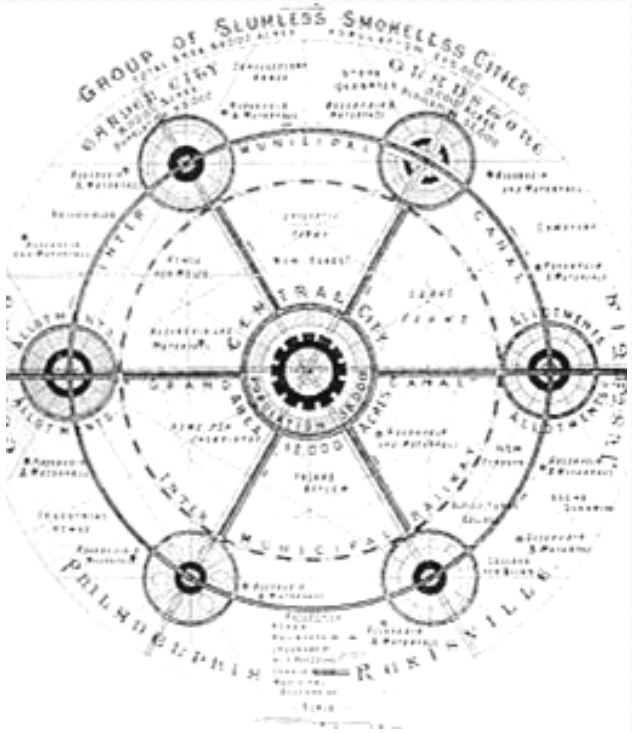
E. Howard
The garden city, 1898



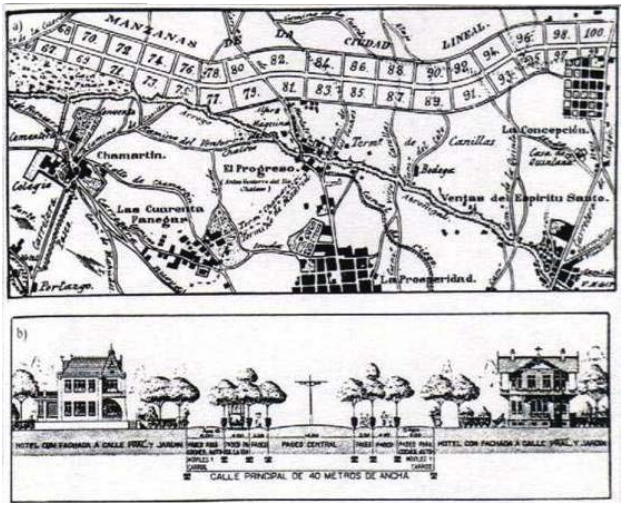
E. Henard
Cities of the future, 1910

+ Forms of Urban Genesis

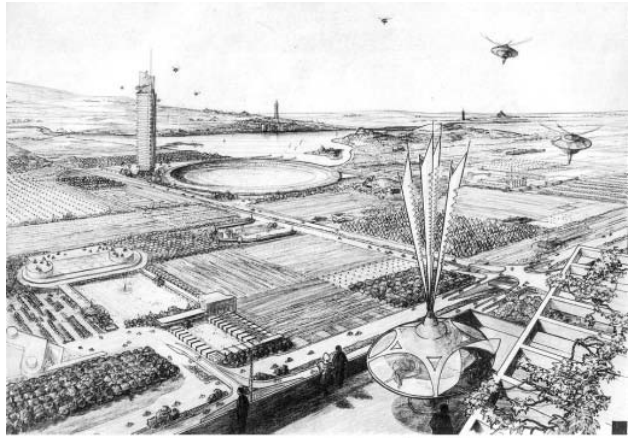
Utopias, anti-utopias, ideal cities

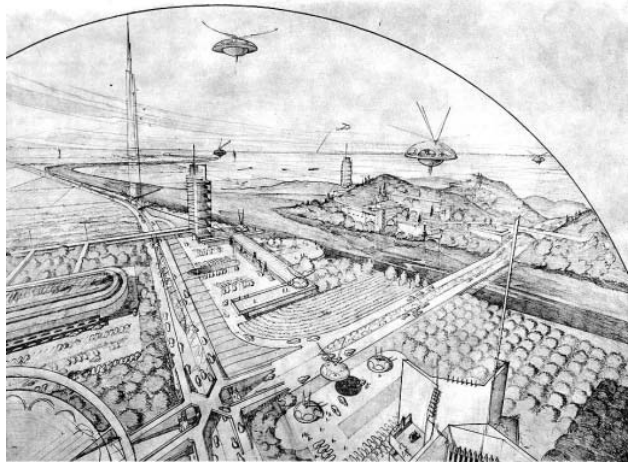


E. Howard, 1890
Slumless and smokeless city

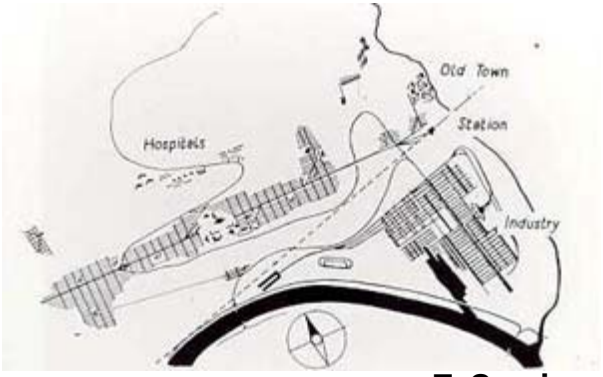


A. Soria Y Mata
Ciudad Lineal, 1892



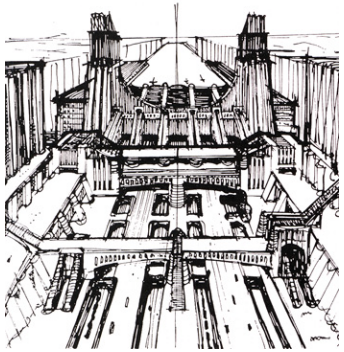


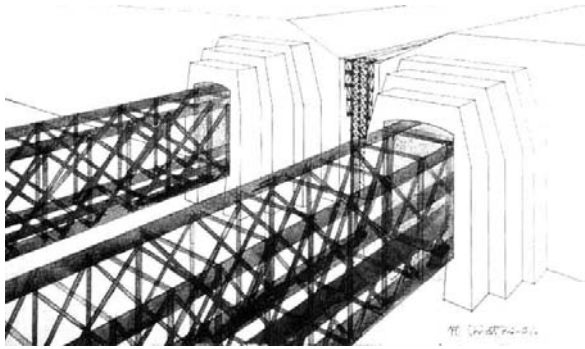
F.L. Wright
Broadacre city, 1934



T. Garnier
Cité Industrielle, 1917

"We must invent and rebuild the modern city, like an immense and tumultuose shipyard: active, mobile and everywhere dynamic. Elevators must not longer hide away like solitary worms in the stairwells, but swarm up the facades like serpents of glass and iron"

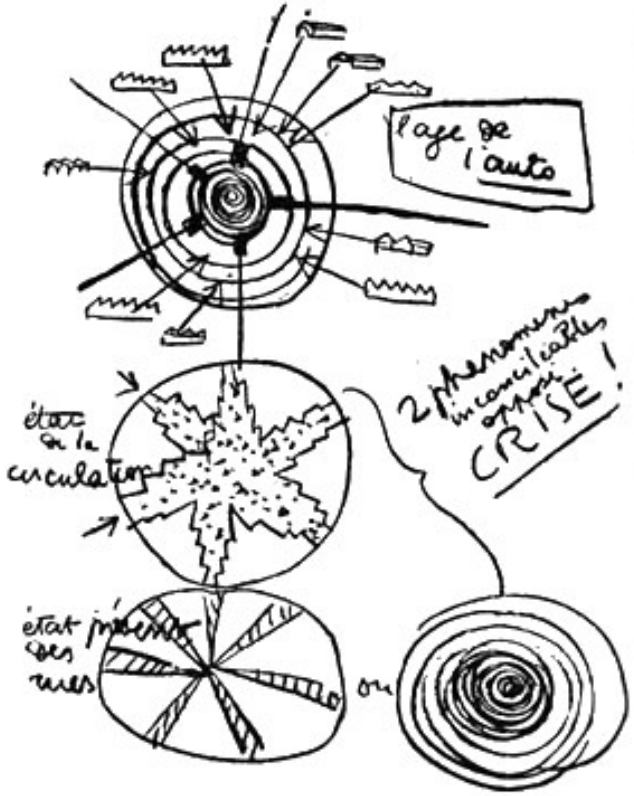




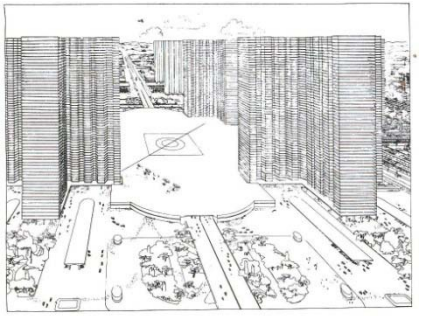
A Sant'Elia
La città nuova, 1914

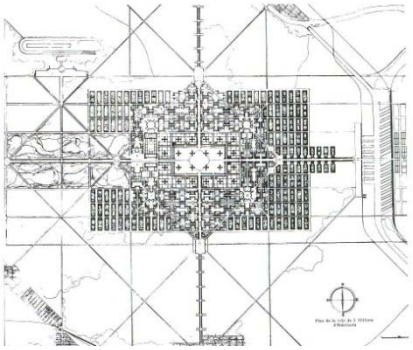
+ Forms of Urban Genesis

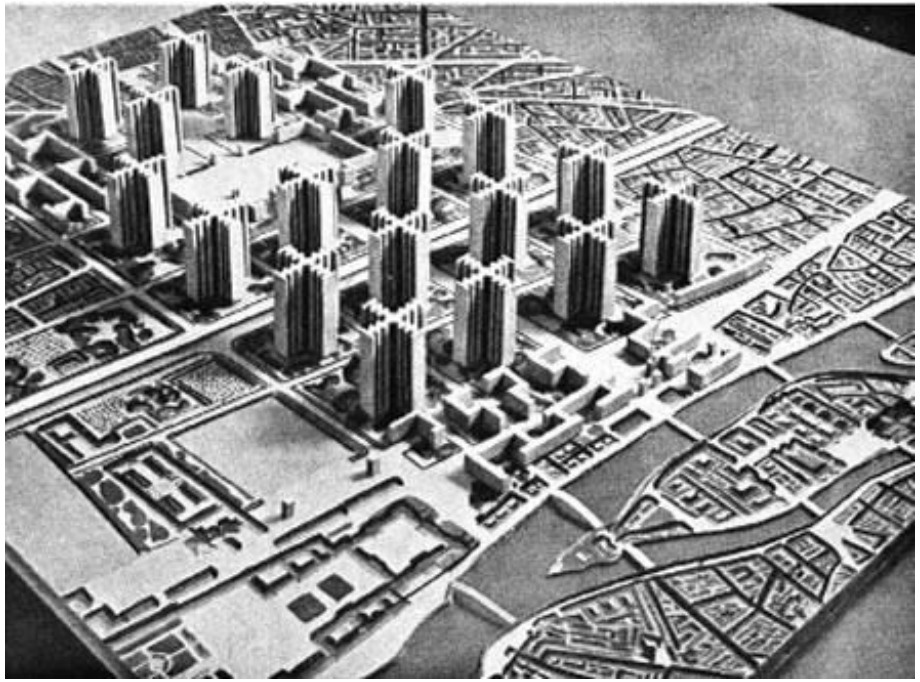
Utopias, anti-utopias, ideal cities



Le Corbusier
Automobile Era, 1940



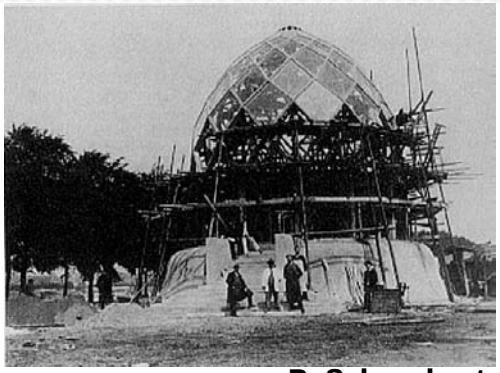




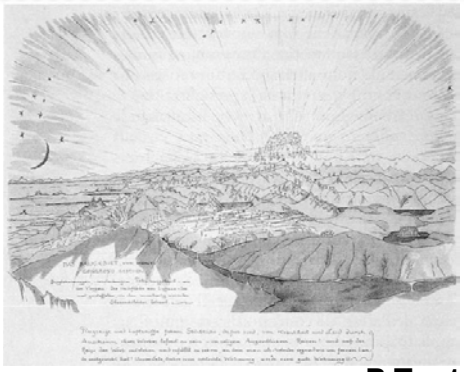
Le Corbusier
La ville radieuse, 1933

"To save itself, every great city must rebuild its centre. City dwellers are being sacrificed to a life without hope- without rest- without sky, sun or greenery.

The harmonious city must first be planned by experts who understand the science of urbanism. They must work out their plans in total freedom from partisan pressures and special interests: once their plans are formulated, they must be implemented without opposition"

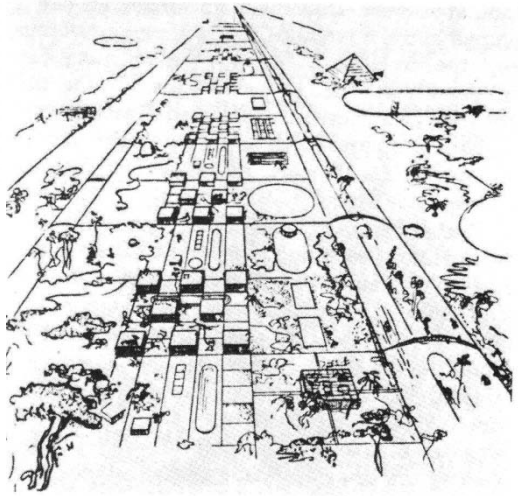


P. Scheerbart
Glass architecture, 1914



B Taut
Alpine architecture, 1917

"People of Europe!
Fashion a holy artifact...
the earth would deck her self through you!"



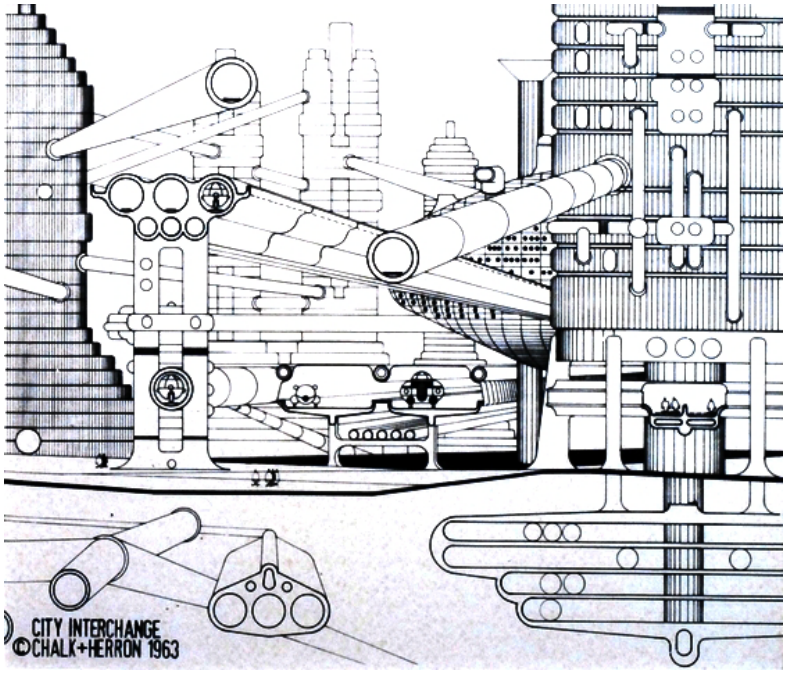
I Leonidov
Magnitogorsk, URSS, 1930

+ Forms of Urban Genesis

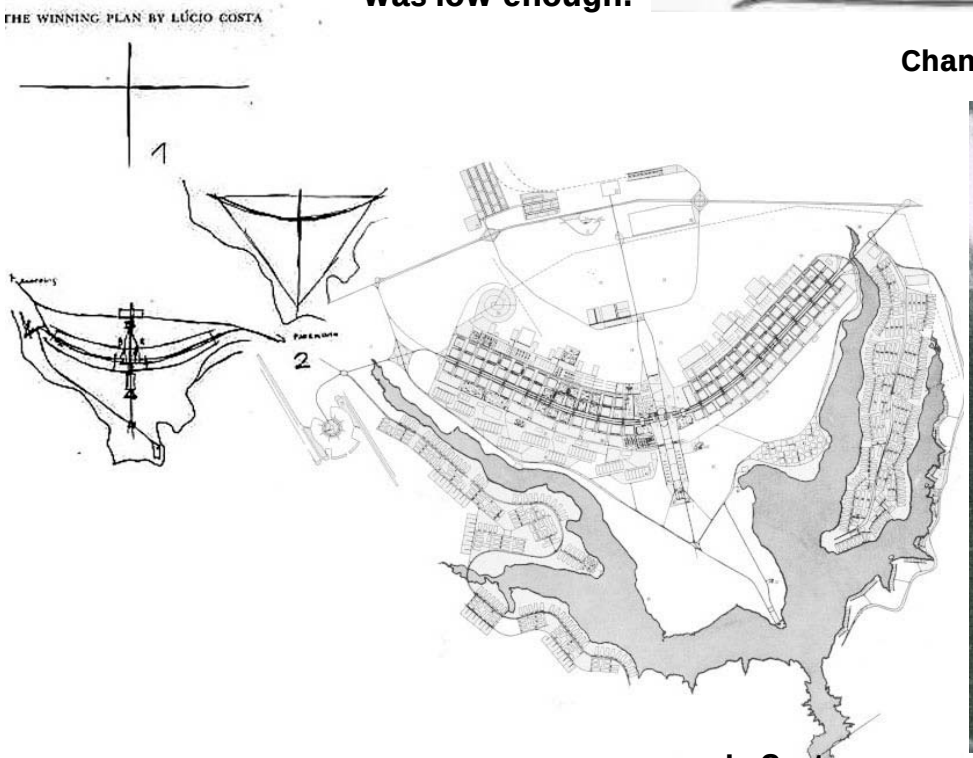
Utopias, anti-utopias, ideal cities

Le Corbusier found his patron in a post-colonial government steeped in the autocratic traditions of the British Raj. He produced for them an exercise in the City Beautiful decked in the trappings of modern architecture, a latter-day New Delhi. There was a grid of fast traffic roads, already used in plans for **Marseilles and Bogotá, to cater for a level of car ownership even lower than the Paris of 1925, which was low enough.**

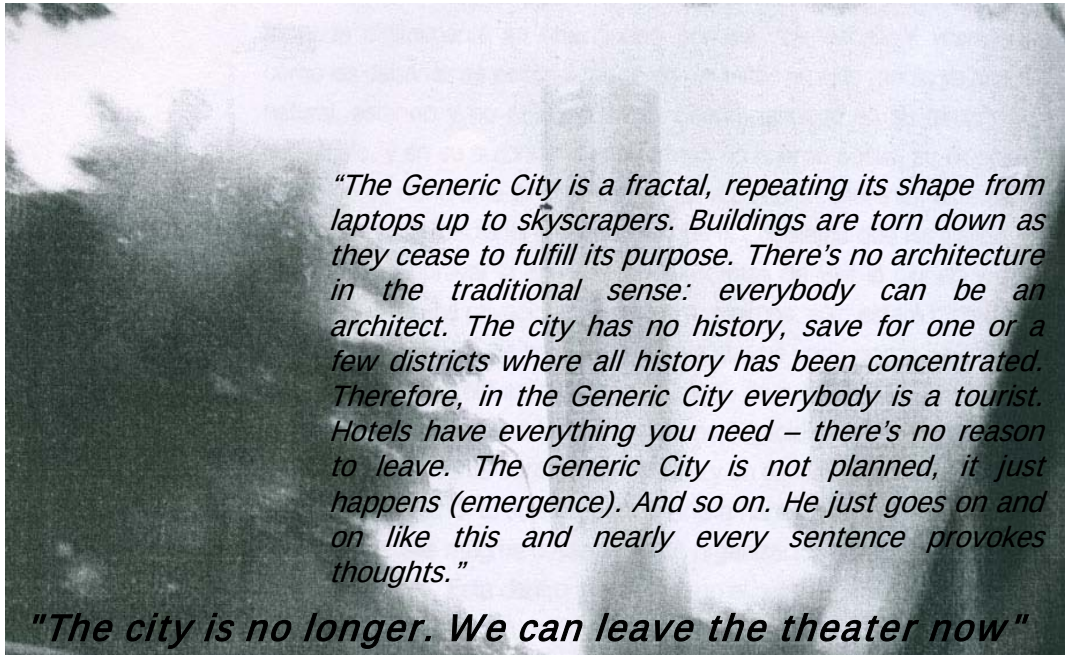
Le Corbusier
Chandigarh plan, 1955



Archigram group
Instant cities, 1960



L. Costa
Brasilia's Plan, 1957



"The city is no longer. We can leave the theater now"

"The Generic City is a fractal, repeating its shape from laptops up to skyscrapers. Buildings are torn down as they cease to fulfill its purpose. There's no architecture in the traditional sense: everybody can be an architect. The city has no history, save for one or a few districts where all history has been concentrated. Therefore, in the Generic City everybody is a tourist. Hotels have everything you need – there's no reason to leave. The Generic City is not planned, it just happens (emergence). And so on. He just goes on and on like this and nearly every sentence provokes thoughts."

Rem Koolhass
The Generic City, 1994

+ Forms of Urban Genesis

Paris, by Haussman in 1860

Haussman streetwork between 1850 and 1870: a plan of "strategic beautification."

The Haussmann's Renovations, or the *Haussmann Plan*, was a modernisation programme of Paris commissioned by Napoléon III and led by the Seine prefect, Baron Georges-Eugène Haussmann, between 1852 and 1870. Though work continued until the end of the century, well after the Second Empire's demise in 1870, it is often referred to as the "Second Empire reforms".

The project encompassed all aspects of urban planning, both in the centre of Paris and in the surrounding districts: streets and boulevards, regulations imposed on facades of buildings, public parks, sewers and water works, city facilities and public monuments. The planning was influenced by many factors, not the least of which was the city's history of street revolutions.

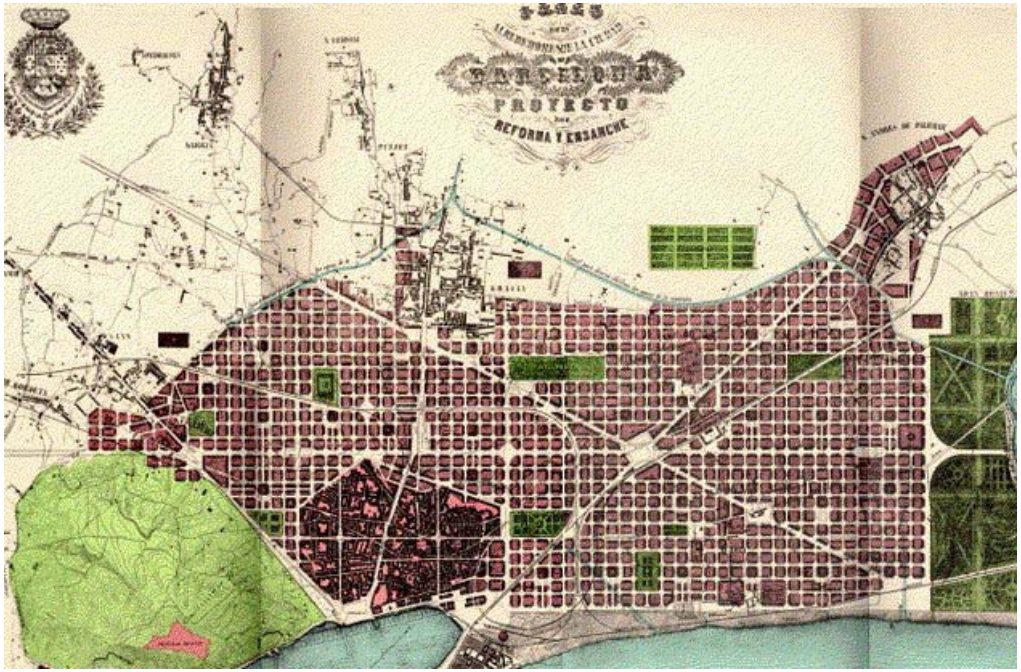
Haussmann's approach to urban planning was strongly criticized by some of his contemporaries, ignored for a good part of the twentieth century, but later re-evaluated when modernist approaches to urban planning became discredited. His restructuring of Paris gave the city its present form; its long straight, wide boulevards with their cafés and shops determined a new type of urban scenario and have had a profound positive productive influence on the everyday lives of Parisians. Haussmann's boulevards established the foundation of what is today the popular representation of the French capital around the world, cutting through the old Paris of dense and irregular medieval alleyways into a more rationally-designed city with wide avenues and open spaces which extended outwards far beyond the old city limits.

The plans were a reflection of the Empire's evolution: authoritarian until 1859, and more flexible after 1860. 20,000 houses were destroyed, and over 40,000 built between 1852 and 1872.

The Baron Haussmann's transformations to Paris brought a real improvement to the quality of life in the capital. Disease epidemics (save tuberculosis) ceased, traffic circulation improved and new buildings were better-built and more functional than their predecessors.

+ Forms of Urban Genesis

Barcelona, by cerdá in 1860



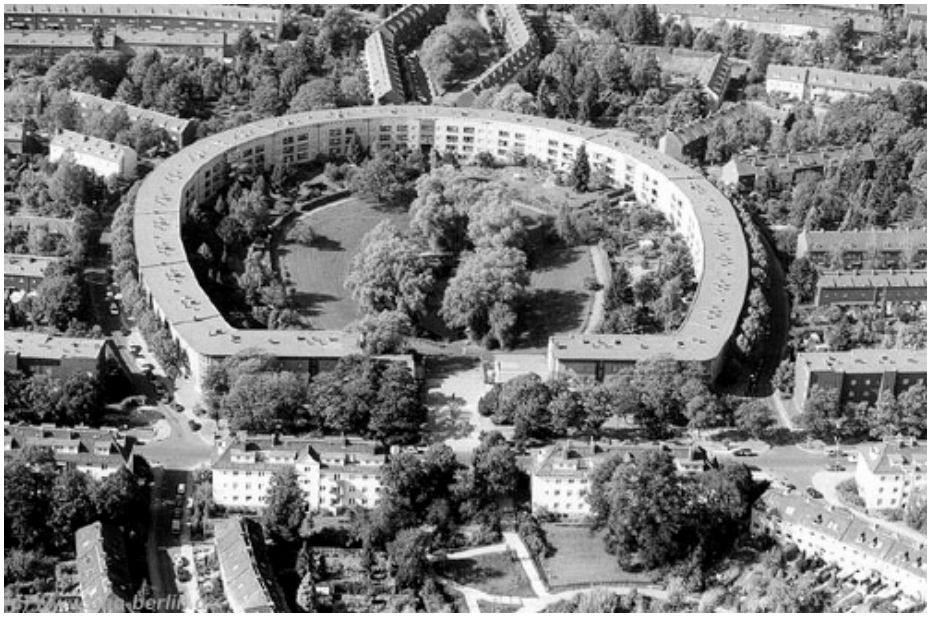
Barcelona's urban extension, the **Eixample** Cerdà, is a vivid illustration of the intense reflection on the shape of cities that took place during the nineteenth century and that characterised a city planning that arose from an urgent need for solutions to an environmental and social urban crisis. Extreme conditions of urban crowding, the result of rapid city growth, and insalubrious housing and public places were indeed seen as the prime cause of the soaring death rate that marked the vital and statistical perception of urban spaces and was undoubtedly the city's biggest problem.

The idea was to place two main avenues along a geographic parallel split by roads crossing perpendicularly. His central aim was to overcome social problems by using quadrangular blocks of a standard size, with strict building controls to ensure that they were built up on only two sides, to a limited height, leaving a shady square or garden in between. The recreational open space with open sides to the blocks was to guarantee the houses the maximum amount of sun, light and ventilation. The housing blocks were to be orientated NW-SE to ensure all apartments received sunshine during the day. Each district would be of twenty blocks, containing all the community shops and services. The sides of the blocks measured 113.3 metres and covered 12,370 square metres, of which at least 800 square metres were to be gardens. The regular streets were built 20 metres wide. Gran Via was 50 metres wide and Passeig de Gracia was as much as 60 metres wide. For Cerdà, the function of the street was for communication and the movement of traffic.

The most characteristic feature of Cerdà's plan is the 45º angled corner of each block *(chaflanes).* The idea behind this was to ensure more fluid traffic in all directions, above all for public transport: it was mainly the steam tram that Cerdà had in mind, and it was its long turning radius which determined the angle of the corners of the buildings.

+ Forms of Urban Genesis

Berlin, by B Taut in 1924
The *Siedlungswesen movement* (1919-1933)



Berlin Modernism Housing Estates consists of six subsidized housing estates (*Siedlungen)* that testified the innovative housing policies in the pre-war Germany, from 1910 to 1933 during the Weimar Republic, when the city of Berlin was particularly progressive socially, politically and culturally.

In 1924 the architect Bruno Taut was made chief architect of GEHAG, a housing cooperative in Berlin, and was the lead designer of several successful large residential developments, notably the 1925 Horseshoe Development "Hufeisensiedlung". Taut worked under the city architect of Berlin **Martin Wagner**, and in company of several important architects including **Walter Gropius**, the director of the Bauhaus, at Siemensstadt just before the war.

This experiments provide exceptional examples of new urban and architectural typologies, featuring new design solutions, as well as technical and aesthetic innovations for it's time. This are outstanding examples of the building reform movement that contributed to improve housing and living conditions for people with low incomes through novel approaches to town planning, architecture and garden design. Their style can be traced in their development from the picturesque garden-city style of Staaken, built in 1914.

The designs featured controversially modern flat roofs, humane access to sun, air and gardens, and generous amenities like gas, electric light, and bathrooms.

The later developments boldly proclaim the identity of the Marxist housing associations which built them, in contrast to the more traditional design of neighboring estates. Politically opposes critics, complained that these developments were too opulent for 'simple people'.

Despite their large-scale composition, made up of blocks of flats, the garden-city ideal is never far away. Open balconies, trees and gardens help to make these some of the best housing estates ever built. Today they are recognized as a UNESCO World Heritage Site.

In between the ambience of new economies, de-centralized, de-territorialized and based on the no-cable-communication technologies, the cities switch meaning. Probably for the vague regular distracted citizen, nothing changes in his life time, but it does, and everyday is quicker.
The cities of the new century are the main sources of information and knowledge, and there is where the main activities are happening now, there for is where the biggest populations live.
The new ways of working, basically providing services for big enterprises to function, enterprises that can be located everywhere because this services can all be managed by internet, mixed with a low attraction for the rural life style, this last stimulated by a society of **mass media** that promotes the urban life - in not such a sustainable way- lead to the growth of the urbanity: not only in the sense of traditional urban growth of building , but lead to the conversion of land into urban, when at the same time, it is widely recognized and wanted the rural landscape to relax and live.

This panorama is normally related to an **American way of life**, the dream of space, green-isolation, at the same time of having all the services of the modern life. After this dreams come together, the **suburbia** is born and the **sprawl** becomes the rule in America, and after them, the rest of the world Americanized by the TV and the cinema, and the **market economy**.

Conurbation

A conurbation is a region comprising a number of cities, large towns, and other urban areas that, through population growth and physical expansion, have merged to form one continuous urban and industrially developed area. In most cases, a conurbation is a **polycentric urban agglomeration**, in which transportation has developed to link areas to create a single urban labor market or travel to work area.
Other concepts are important to keep in mind when reflecting about the urban stain growth: **metropolitan area** concept includes also the conurbation of a central city with it's suburbs, which are not more than smaller municipalities swallowed by the giant and hungry metropolis. Also in the term **megalopolis** the conurbation is implicit, but normally refers to less complex cities, where the flows of persons and there for, workers, is not so developed.

Sprawl

The famous concept of urban sprawl, also known as **suburban** sprawl, is a multifaceted concept, which includes the spreading outwards of a city and its suburbs to its outskirts to **low-density and auto-dependent** development on rural land, high segmentation of uses and various other design features that encourage car dependency.

It has been shown that urban sprawl can increase the aggregate urban land use and lower the average land use density while at the same time lowering average commuting travel times and increasing discretionary mobility. Residents of sprawling neighborhoods tend to emit more pollution per person and suffer more traffic fatalities.

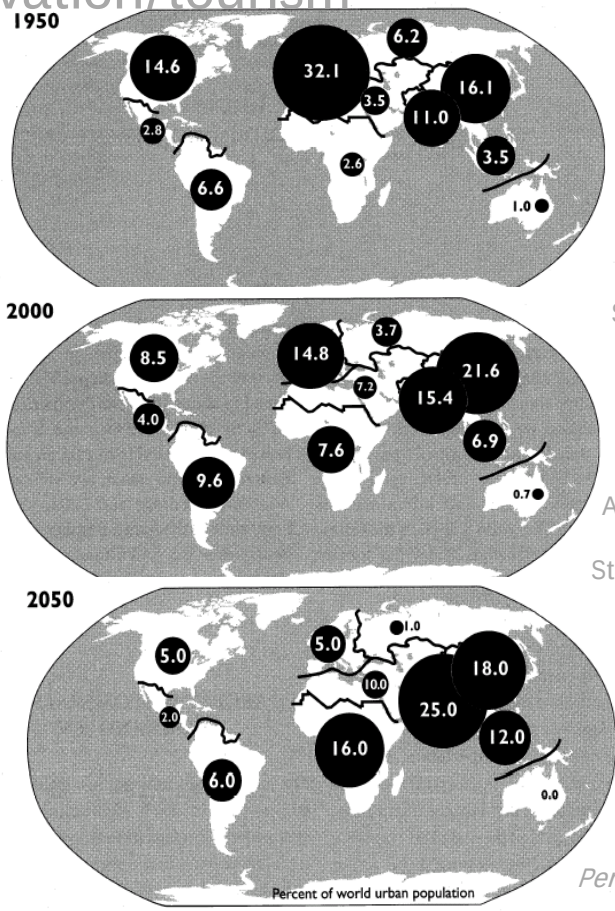
+ power/research/art/entertainment/finance/business
education/culture/innovation/tourism

XXI century urban phenomenon: The Mega City Regions

A megacity is usually defined as a **metropolitan area** with a total population exceding 10 million people. Some definitions also set a minimum level for population density (at least 2,000 persons/km2). A megacity can be a single metropolitan area or two or more metropolitan areas that converge. The terms **conurbation, metropolis, megalopolis and metroplex** are sometimes used synonymously.

It's the beginning of the XXI century: the era of management, communication and integration. The cities more, than being the human's best invention of all times, became the centers of all "important" activities. More than half of the population of the world lives in cities, without respect of religions, races or GDP incomes. **It is a global reality.** The traditional administrative boundaries have lost most of their meanings to encompass the urban phenomena, as much in the first as in the third world. The economic - market dynamics affected the global, same as cultural and social dynamics brought in by the tele-communications and the advances in all the **tele-technologies.** There are cities growing, sprawling and decaying following the same patterns all over the world.

The best way to stay in the game seems to be to connect: to internet, to people, to business. The need to connect in humans is as old as the cities it self, in fact is the reason why humans got together in the first place. And at the point where the growth of the population got us, the only way to maintain an equilibrium is to recognize, *officialize* and give power to **networks and territorial coalitions.**



Mega City Regions of the world and their populations (millions of people)

North America:
Boston - Washington 54
South Florida, North California 13
South California 21
Chicago - Pittsburgh 46

Central - South America:
Greater Mexico 45
Rio de Janeiro - Sao Paulo 43
Greater Buenos Aires 14

Asia:
Greater Tokyo 55
Osaka - Nagoya 36
Shanghai – Nanking -Hangzhou 66
Great Beijing 43
Delhi Lahore 120
Mumbai Poona 62
Bangalore Madras 72

Europe:
Amsterdam - Brussels - Antwerp 60
South England 50
Stuttgart – Frankfurt - Mannheim 23
Turin-Milan-Venice 25
Barcelona - Lyon 25

P Hall-K Pain, 2006

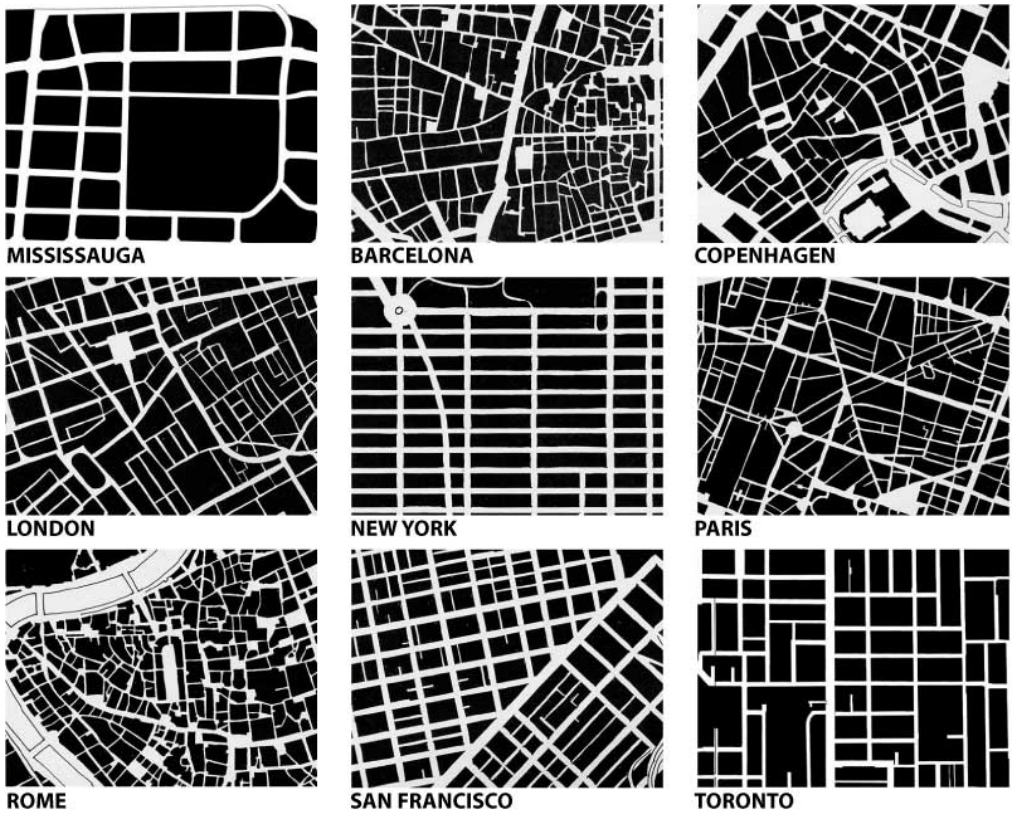
Percentage of world urban population
UN database 2009

" … A series of anything between 10 and 50 cities and towns, physically separate but functionally networked, clustered around one or more larger central cities, and drawing enormous economic strength from a new functional division of labor. These places exist both as separate entities, in which most residents work locally and most workers are local residents, and as a parts of a wider functional urban region connected by flows of people and information carried along ***motorways, high-speed rail lines and telecommunications cables… "***

P Hall-K Pain, 2006

+ Urban Morphology

Urban morphology is the study of the form of settlements and the process of their formation and transformation. The study seeks to understand the spatial structure and character of a metropolitan area, city, town or village by examining the patterns of its component parts and the process of its development. This can involve the analysis of physical structures at different scales as well as patterns of movement, land use, ownership or control and occupation. Typically, analysis of physical form focuses on street pattern, lot (or, in the UK, plot) pattern and building pattern, sometimes referred to collectively as urban grain. Analysis of specific settlements is usually undertaken using cartographic sources and the process of development is deduced from comparison of historic maps.



TRACES – PATTERNS – DESIGNS

The form of cities is influenced more by the arrangement of their streets and squares than by any other consideration. City form has changed dramatically through the ages. A wide variety of circumstances is expressed in the form ultimately chosen, including: **values, philosophy, population size, systems of government, artistic sensibility, design techniques, building methods, paving techniques, transport technology, sewage and waste disposal, and energy supply.**

It is definitely through the form, shapes and geometries, that we can describe cities, and even get to scratch the surface of what they mean, need and might be. By studying the morphology we get to read about history, society, culture, of a determinate piece of urban ground.

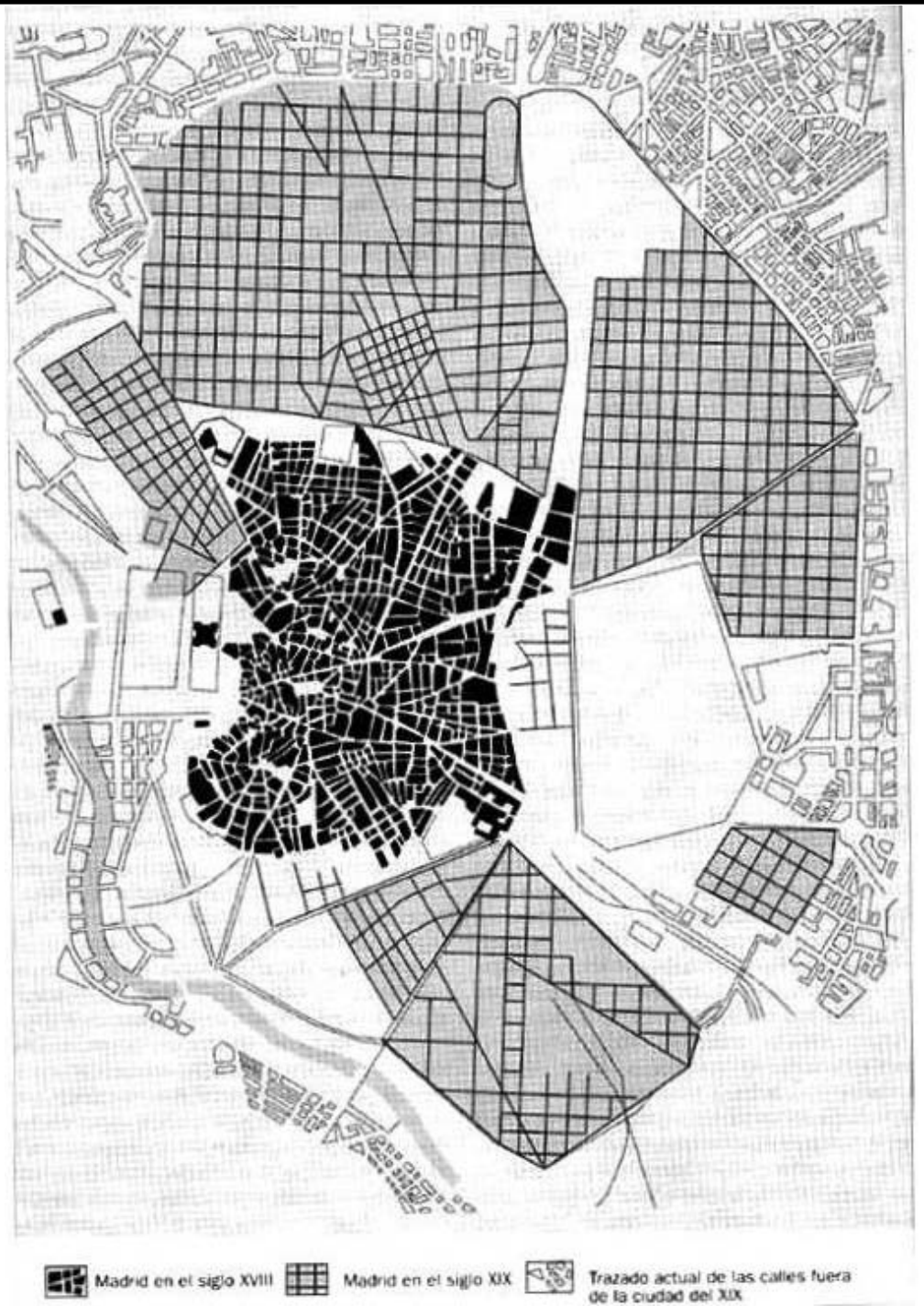
So what is a good city form?
*Now we can say the magic words: It is **vital** (sustenant, safe and consonant); it is **sensible** (identifiable, structured, congruent, transparent, legible, unfolding and significant); it is **well fitted** (a close match of forma and behavior which is stable, manipulable and resilient); it is **accessible** (diverse, equitable, and locally manageable) and it is **well controlled** (congruent, certain, responsible and intermittently loose).*
And all of these are achieved with justice and internal efficiency. Or in the more general terms, it is a continuous well connected, open place, conducive to development.

K Lynch, Good City Form

+ Urban Morphology

A settlement form is the spatial arrangement of persons doing things, the resulting spatial flows of persons, goods and informations and the physical features which modify space in some way significant to those actions, including enclosures, surfaces, channels, ambiences and objects. This spatial distributions tend to change as well as the control and perception over them. But this description has been historically taken as a bi-dimensional matter of study and that's a mistake. The phenomena of the city are complex and extended to so many spheres that we can only read features, not the entire phenomena.
The contemporary city as a result can only be understood as a complex process in time, with specific products on space.

Why cities fold and unfold in a certain way, is as much fault of the attention paid by the people in charge of taking care of it – usually planners – as a consequence, and most of the times involuntary, of the social dynamics of the communities that live on it's physical territory.



Urban pattern evolution of Madrid: XVIII century, XIX century and actual outskirts.
M de Solá Morales, Formas de Crecimiento urbano, 1997

One can not design a city
*Only to provide the **axes** for it to **develop** with a certain **way***

Forms of urban growth.

The cities today grow in very varied ways, depending on many aspects of its planning – including the lack of this – and approaches, politics and social forces, present over it's territories. This growth happens in phases, determined by historical times and styles, and by the identification of the different typological patterns followed by each of this phases, the patchwork of a contemporary city can be unfolded to the eyes of who ever attempts to propose a better future or any kind of novelty on it's surface.

According to ***M De Solá Morales***, cities – and specially Latin ones - grow through 3 main processes which are :

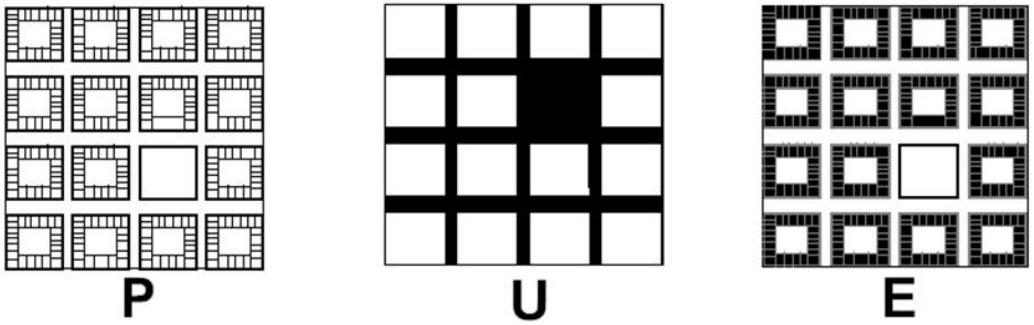
P : to plot. It consist in the transformation of rural (or un-tampered land) into urban soil, legally available for construction or other interventions, by defining building plots.

U : to urbanize. This process consist in the public or private development of the necessary networks of infrastructures for the settlement of population over a new territory.

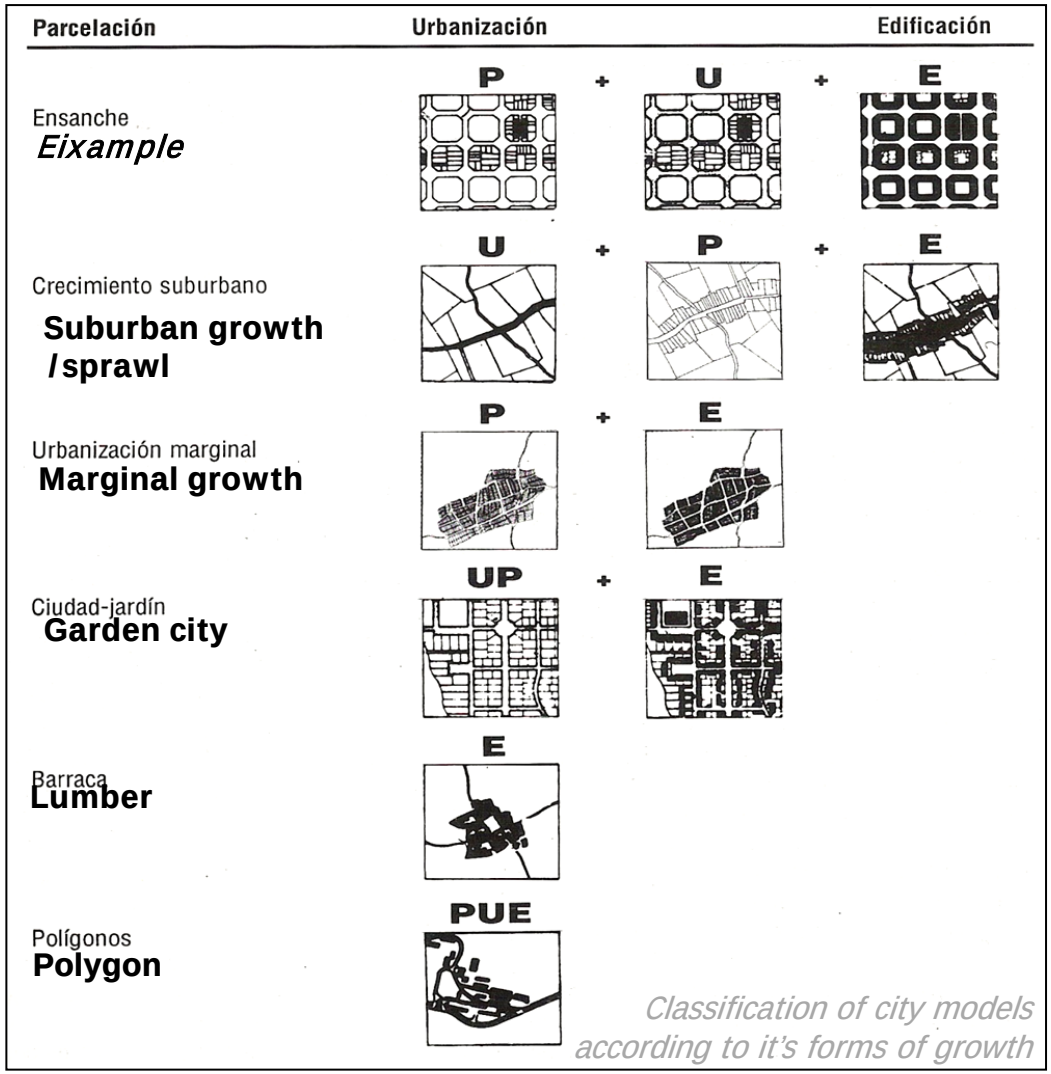
E : to edificate. It's the architectural development of buildings over the original plots.

Although this theories of how cities grow, normally are understood into planned and regular settlements, where the PUE is studied and applied as part of the model of urban growth taken in every city, this also comprehends the irregular, not planned and also illegal ways of growth, so common in the so called " third world", and that include the marginal growth and lumbers, converting by amount in shanty towns.

Actually, is exactly there where the city is made by the citizens, and where the culture is explicit in the urban morphology, including the problems that being illegal and unplanned may carry.



Forms of urban growth, according to M De Solá Morales.



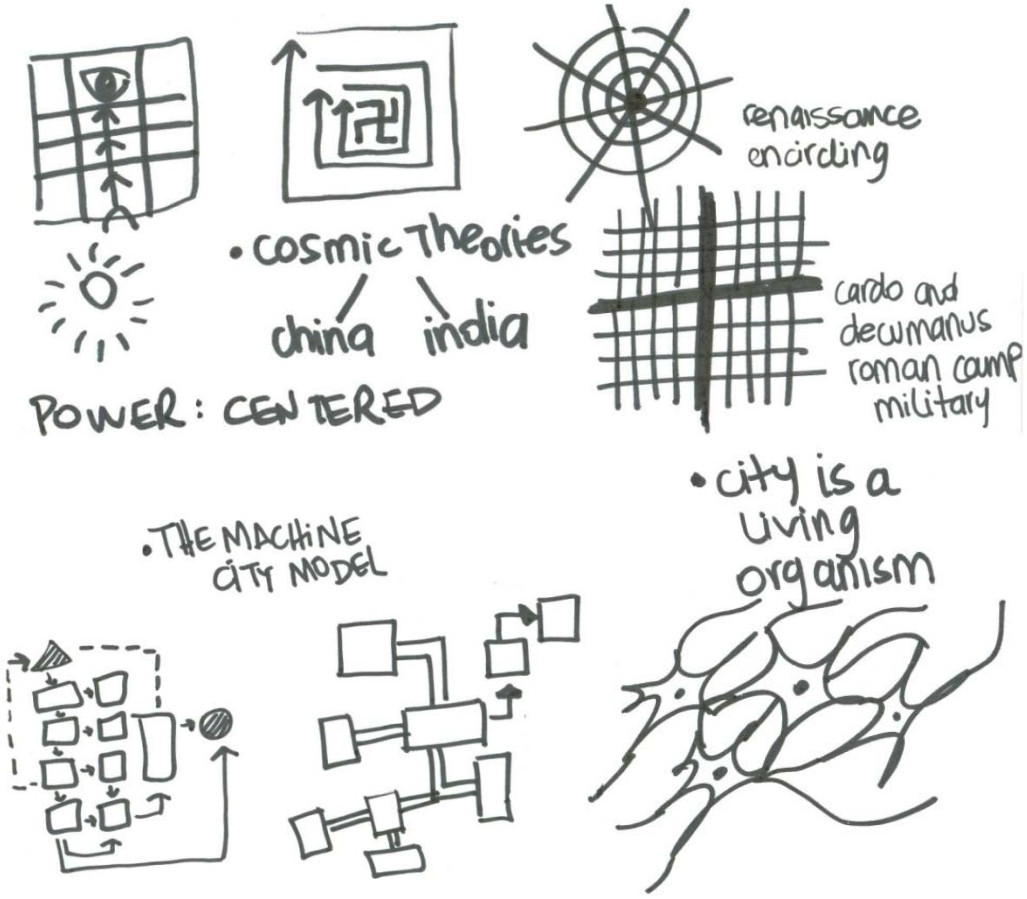
Classification of city models according to it's forms of growth

+ About urban models

Language of city patterns

Urban models refers to abstract theories of how cities function, in which the elements of the systems that compose the city, and all the relations between those elements, are clearly specified, in a quantitative or qualitative mode, permitting the emulation or translation into other territorial realities.
The models are used by urbanist as images or ideal scenarios , from where pictures of urban desires are taken to illustrate a design to others. In this way models are abstractions that help the designers understand better, and concrete ideas.

Through the long history of cities, there have been many approaches to models that can **explain the reality of urbanity.** The first settlements are now understood like cosmic designed settlements, because – coincidencially or not – the ancient societies where all more conscious of how much we are just something in the middle between the heaven and the hell, the center of the earth and “the great beyond”, and they all respected the centers or nodes where sacred humans got together to be conscious of it. For the more advanced urban ancient cultures, the Chinese and Indian cultures, the cities had one single center where the power was concentrated. This model lasted and was inherited by the western civilizations, which still by the new plant colonial cities of the XVIII century, still resembled the geometrical center with the main power, and off course the principal head.
But after many revolutions, and the last two centuries, logics really changed a lot and things seem to be backwards.
For the functionalists, the after-war/after-industrialization men, the city assembled a machine, or at least, it should, in the way that all it’s parts should work with a common finality: the production. But as a reaction against this, or parallel to it, also the city stated working as a living organism, as alive and with what seemed to be, a personality of its own.



MODEL
+ A small object, usually built to scale, that represents in detail another, often larger object.
+ A preliminary work or construction that serves as a plan from which a final product is to be made.
+ Such a work or construction used in testing or perfecting a final product.
+ A schematic description of a system, theory, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics.
+ A style or design of an item.
+ One serving as an example to be imitated or compared, Ideal.
+ One that serves as the subject for an artist, especially a person employed to pose for a painter, sculptor, or photographer.
+ A person employed to display merchandise, such as clothing or cosmetics.
+ An animal whose appearance is copied by a mimic.

+ About urban models

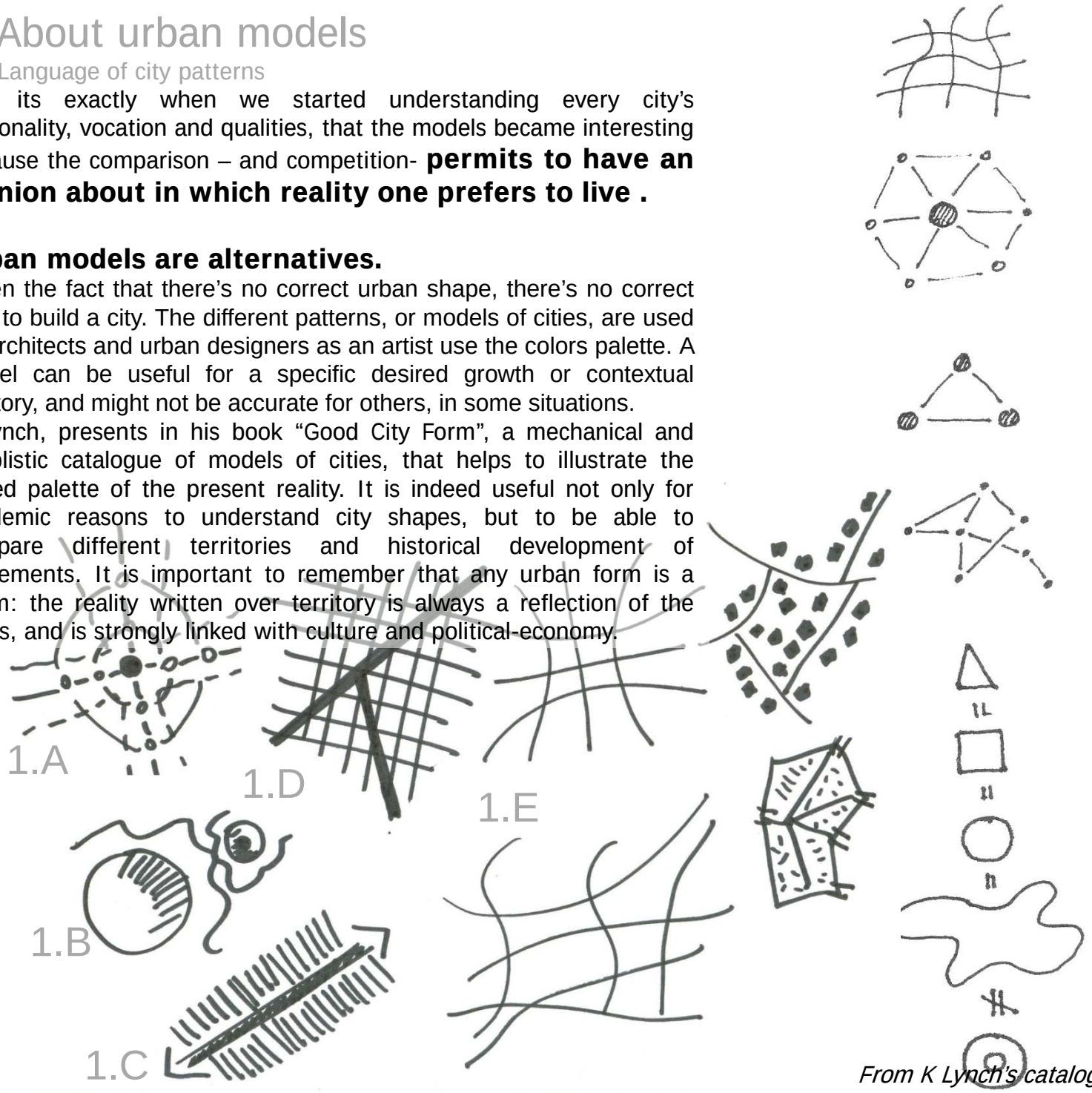
Language of city patterns

And its exactly when we started understanding every city's personality, vocation and qualities, that the models became interesting because the comparison – and competition- **permits to have an opinion about in which reality one prefers to live .**

Urban models are alternatives.

Given the fact that there's no correct urban shape, there's no correct way to build a city. The different patterns, or models of cities, are used by architects and urban designers as an artist use the colors palette. A model can be useful for a specific desired growth or contextual territory, and might not be accurate for others, in some situations.

K Lynch, presents in his book "Good City Form", a mechanical and simplistic catalogue of models of cities, that helps to illustrate the varied palette of the present reality. It is indeed useful not only for academic reasons to understand city shapes, but to be able to compare different territories and historical development of settlements. It is important to remember that any urban form is a whim: the reality written over territory is always a reflection of the times, and is strongly linked with culture and political-economy.



1. General patterns
A. The star or asterisk
B. Satellite cities
C. The linear city
D. The rectangular grid city
E. Other grid forms
F. The baroque axial network
G. The lacework
H. The "inward" city
I. The nested city
J. Current imaginings

2. Central place patterns
A. Patterns of centers
B. Specialized and all-purpose centers
C. Linear centers
D. Neighborhood centers
E. The shopping center
F. Mobile centers

3. Textures
A. Cells
B. Sprawl and compaction
C. Segregation and mix
D. Perceived spatial textures
E. Housing types
1. High slabs
2. Towers in the green
3. Dense walkups
4. Ground-access walkups
5. Courtyard houses
6. Attached houses
7. Freestanding houses
F. Housing innovations
G. Systems and self-help

4. Circulation
A. Modal choice
B. Circulation patterns
C. Modal separations
D. Managing travel distance
E. Channel prototypes

5. Open space patterns
A. Distribution of open space
B. Map shapes
C. Open space classes
1. Regional parks
2. Urban parks
3. Squares of plazas
4. Linear parks
5. Playgrounds and playfields
6. Wastelands and adventure playgrounc

From K Lynch's catalogue of models of settlement form

+ About urban models

*Centrism

According to the distribution of centers in a determined geographical territory, or a group of them, and the activities carried out in those centers, there have been identified several patterns in which diverse types of cities can be grouped :

+ **specialized / all-purpose centers,** stresses the characteristic of a node to be particularly dedicated to an activity, segregating actions and services that might not be compatible and creating clusters. It also implicates the high and low class activities, and tends to fall into the absolutism of separating also communities by activities and uses. Another model stresses the importance of a mixed in use center, permitting the encounters of differences and tolerance per se. It is clear that pure mix either pure segregation are not even possible. The more likely model is a **collection of specialized nodes**, linked by marginal zones of mixtures, packed closely enough to ensure **easy access between them**, or guarantying the permanent connections.

+ linear centers, are those features of the North American city where stringing out along highways (but also other lines as railways, in a lower scale) form commercial strips, but also industrial, institutional and even residential ones. It is a type of center based on a self-car-mobility, but for sure consumes less land than the rest of car-based forms.

Las Ramblas, Barcelona, linear center

+ **Neighborhood centers,** consist of small scale communities, having inside the basic daily services, including the commercial ones, and recalling the nostalgia of a coherent society of a neighborhood.

+ **Shopping centers,** is the known *piazza of the XXI century city.* Main label of the North American city model, is the planned structure of a pedestrian mall of shops, usually enclosed, surrounded by parking lots. The forms of this center are carefully controlled, and imported the same everywhere in the world as a brand. Normally are placed in the intermediated regions of a metropolis, with excellent highway access, and totally disconnected from surroundings.

+ About urban models

*Poly – Centrism

The Mega City Regions

+ **hierarchical pattern of centers,** refers to the type of cities in where a highest or more intense/specialized in activities node is the visible head of the urban mass. In the surroundings of this main node, there are other small centers that serve only a portion of the total city, and contain some complementary or alternative activities to those in the high center. Each sub center its at the same time, surrounded by complementary and alternative **sub-sub-centers**, that arrange in diverse forms. This model separates the higher and lower functions , and off course, the higher ones are in the main center while the other functions degrade – in a good sense – through out the rest of the branches, ***as a tree.*** This model in reality, tends to develop into a rich center, surrounded by poor peripheries.

" The contending view point is that region-cities should be multinucleate. They should have a whole series of centers with overlapping service areas. Many of the more important ones may service the entire region for special purposes, while also serving smaller areas for other purposes. No exclusive area must be assigned to a single center, although that center may have a general catchment range. People make choices and go now here, now there. Off course not all centers are of the same scale: some larger some smaller. But there is no sharp, steplike distribution of size and service area and no single dominant at the top. In contrast to hierarchical model, this one provides more flexibility, but the capacity of substantial mobility is a requirement . "

K Lynch, 1981

The mega-city region

A new phenomenon is emerging in the most highly urbanized parts of the world: the polycentric mega-city region (MCRs). In arises through a long process as very extended decentralization from big central cities to adjacent smallest ones, old and new.
It is a new form, because of the traditional administrative boundaries have lost most of their meanings to describe or encompass urban phenomena. It is a series of anything between 10 and 50 cities and towns, physically separate but functionally networked, clustered around one or more larger central cities, and drawing enormous economic strength from a new functional division of labour.
These places exist both as separate entities, in which most residents work locally and most workers are local residents, and as parts of a wider functional urban region connected by dense flows of people and information carried along motorways, high-speed rail lines and telecommunications cables: the "*flow space* ", in the words of Castells (1996), with major implications for sustainable development.
It is no exaggeration to say that is the emerging urban form at the start of the XXI century.

A key feature of these regions is that in different degrees they are polycentric. They are becoming more so over time, as an increasing share of population and employment locates outside the largest central city or cities, and as other smaller cities and towns become increasingly networked with each other, exchanging information which bypasses the large central city altogether.

There are two underlying mechanisms of this new urban form: globalization and "Informationalization".
Both of them emphasize the new knowledge economy and the division of labor based on services rather than manufacturing. In this regard, office geography and distribution of service employment become important units of analysis in the new polycentric metropolis.
In his "*The Rise of The Network Society" Manuel Castells* (1996) introduces the logic of the *space of flows* as the dominant spatial logic of the new networked, information society. The space of flows is the new social space where the new global economy organizes society according to the concepts of high mobility of capital, information, technology, ideas, and people, which were only made possible due to the advances in the information technology.
In the new network society, due to advances in communication and information technologies, the simultaneity of time can be separated from physical contiguity of space. There are new alternative material supports of simultaneity other than place, like electronic mediums .Thus, the dominant spatial form in the new society is transformed from being spaces of places to spaces of flows .

+ About urban models

*Poly – Centrism

The Mega City Regions

An urban/metropolitan region is characterized by higher population density and vast human features in comparison to areas surrounding it. Urban areas may be cities, towns or conurbations, but the term is not commonly extended to rural settlements such as villages and hamlets.

Urban areas are created and further developed by the process of urbanization. Measuring the extent of an urban area helps in analyzing population density and urban sprawl, and in determining urban and rural populations.

Unlike an urban area, a metropolitan area includes not only the urban area, but also satellite cities plus intervening rural land that is socio-economically connected to the urban core city, typically by employment ties through commuting, with the urban core city being the primary labor market. In fact, urbanized areas agglomerate and grow as the core population/economic activity center within a larger metropolitan area or envelope.

Metropolitan areas tend to be defined using counties or county sized political units as building blocks. Counties tend to be stable political boundaries; urbanists prefer to work with economic and social statistics based on metropolitan areas. Urbanized areas are a more relevant statistic for determining per capita land usage and densities.

A metropolitan area usually combines an agglomeration (the contiguous built-up area) with peripheral zones not themselves necessarily urban in character, but closely bound to the center by employment or commerce. These zones are also sometimes known as a commuter belt, and may extend well beyond the urban periphery depending on the definition used. It is mainly the area that is not part of the city but is connected to the city.

In practice the parameters of metropolitan areas, in both official and unofficial usage, are not consistent. Sometimes they are little different from an urban area, and in other cases they cover broad regions that have little relation to the traditional concept of a city as a single urban settlement. Thus all metropolitan area figures should be treated as interpretations rather than as hard facts. Metro area population figures given by different sources for the same place can vary by millions, and there is a tendency for people to promote the highest figure available for their own "city". However the most ambitious metropolitan area population figures are often better seen as the population of a "metropolitan region" than of a "city".

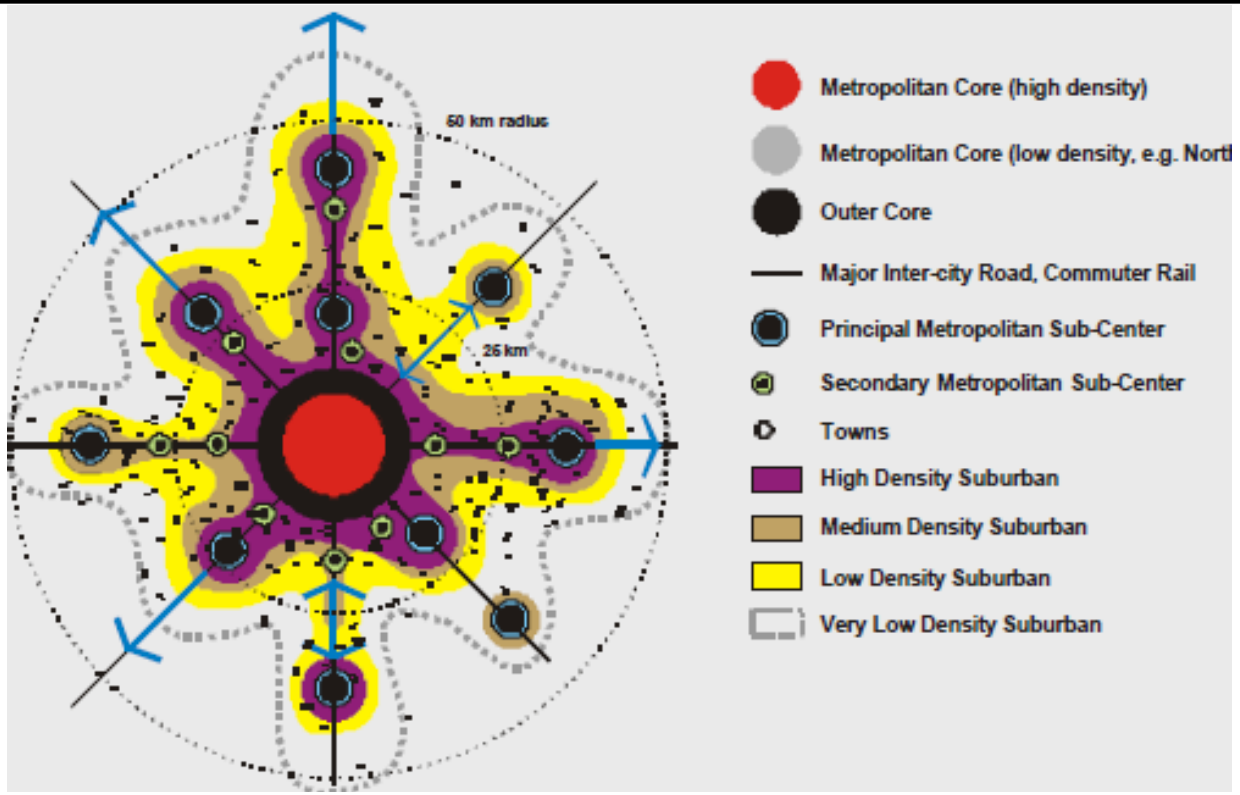
There has been no significant change in the basic metropolitan area "concept" since its adoption in 1950, though significant changes in geographic distributions have occurred since, and is expected to further evolve through time. Because of the fluidity and evolution of the "term" *metropolitan statistical areas*, the colloquial reference by the general population and media to define an *MSA* is with a more familiar reference to "metro service area, metro area, metro, or *MSA*" and widely intimated to mean *the aggregate geographic area inclusive of not only a well known city population, but also its inner city, suburban, exurban and sometimes rural surrounding populations, all of which are influenced by employment, transportation, and commerce of the more largely well known urban city.*

A polycentric metropolitan area *needs not be physically connected by continuous built-up development, distinguishing the concept from conurbation, which requires urban contiguity*. In a metropolitan area, it is sufficient that central cities together constitute a large population nucleus with which other constituent parts have a high degree of integration.

+ About urban models

*Poly – Centrism

The Mega City Regions



			LOCATION	DENSITY	FORM
MR Core	Metropolitan Core (high density)	MC	central in region	> 15,000 inh/km2	principal regional node
	Metropolitan Core (low density)	MC	central in region	7,500 - 10,000 inh/km2	principal regional node (principally in North America)
	Outer Core	OC	surrounding Metropolitan Core	5,000 - 15,000	concentric ring
Suburban Areas	Principal Metropolitan Sub Centers	PMSC	dispersed, mostly within 50 km radius	3,500 - 15,000	concentrated, large sub-regional node
	Secondary Metropolitan Sub Centers	SMSC	dispersed, mostly within 50 km radius	3,500 - 5,000	smaller concentrated node
	High Density Suburban	HDS	surrounding OC, PMSC, MSC	2,000 - 5,000	concentric around OC; corridors, clusters
	Medium Density Suburban	MDS	connecting OC to PMSC, MSC	1,000 - 2000	clearly defined, often contiguous corridors and clusters
	Low Density Suburban	LDS	dispersed throughout Metropolitan Region	500 - 1,000	dispersed
	Very Low Density Suburban	VLDS	dispersed throughout Metropolitan Region	250 - 500	dispersed

Urban region anchored on **central economic core** having more than 1 million non-farming residents

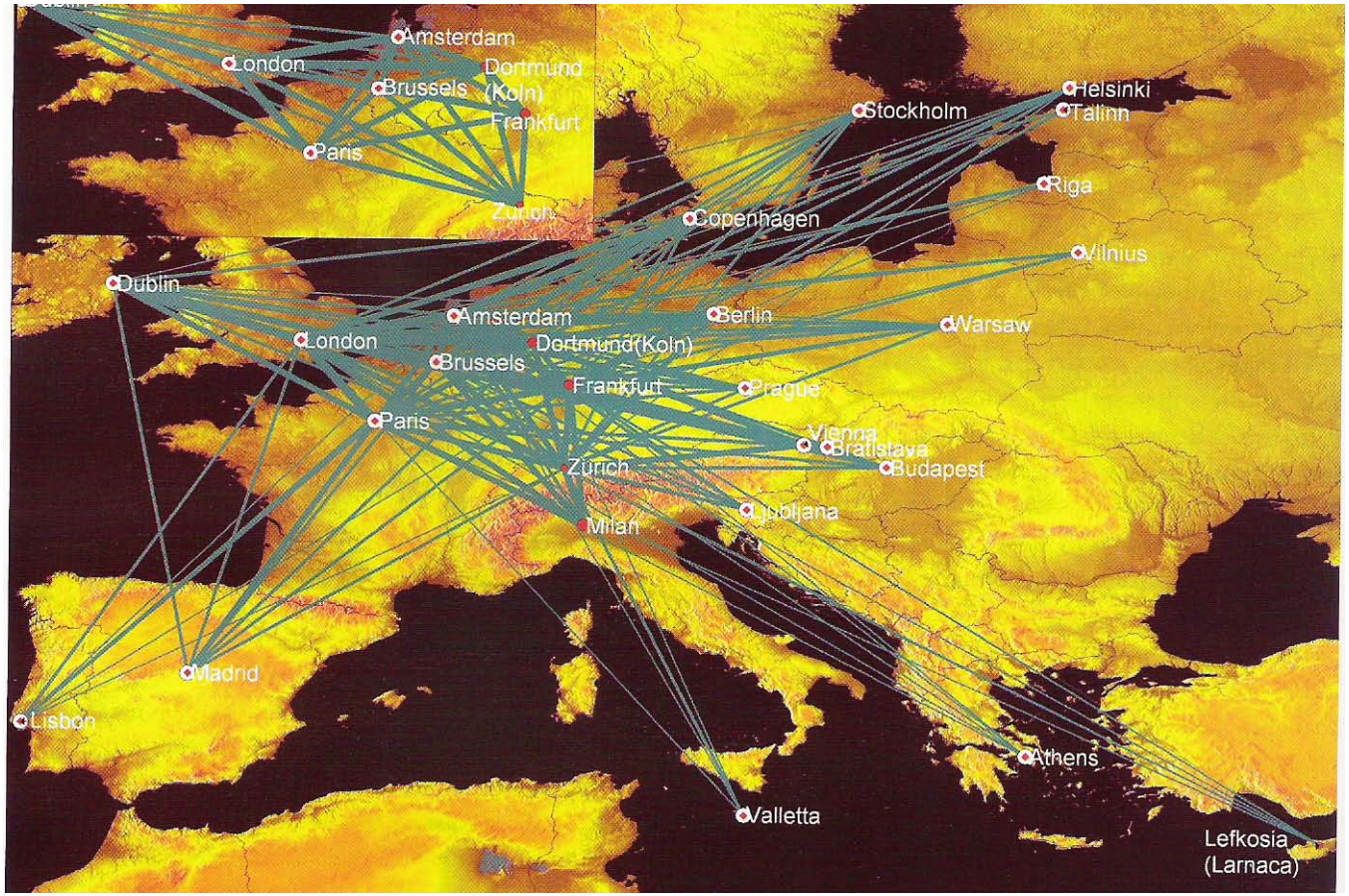
Hinterland defined by one or more of: daily worker commutershed (1 hr drive - time?); majority of daily supply flows to firms (2 hr drive-time?)

Core and hinterland **contiguous** with high (differentiating) population and employment densities

+ About urban models

*Poly – Centrism
The Mega City Regions

The analysis of travel movements :: **Air movements**



Standardized number of air connections
+ air time POLYNET cities to all other citie

- 0.7 to 0.95
- 0.5 to 0.7
- 0.3 to 0.5
- 0.05 to 0.3

- Capital city
- Greater city
- Middle sized city
- Smaller city
- Country border

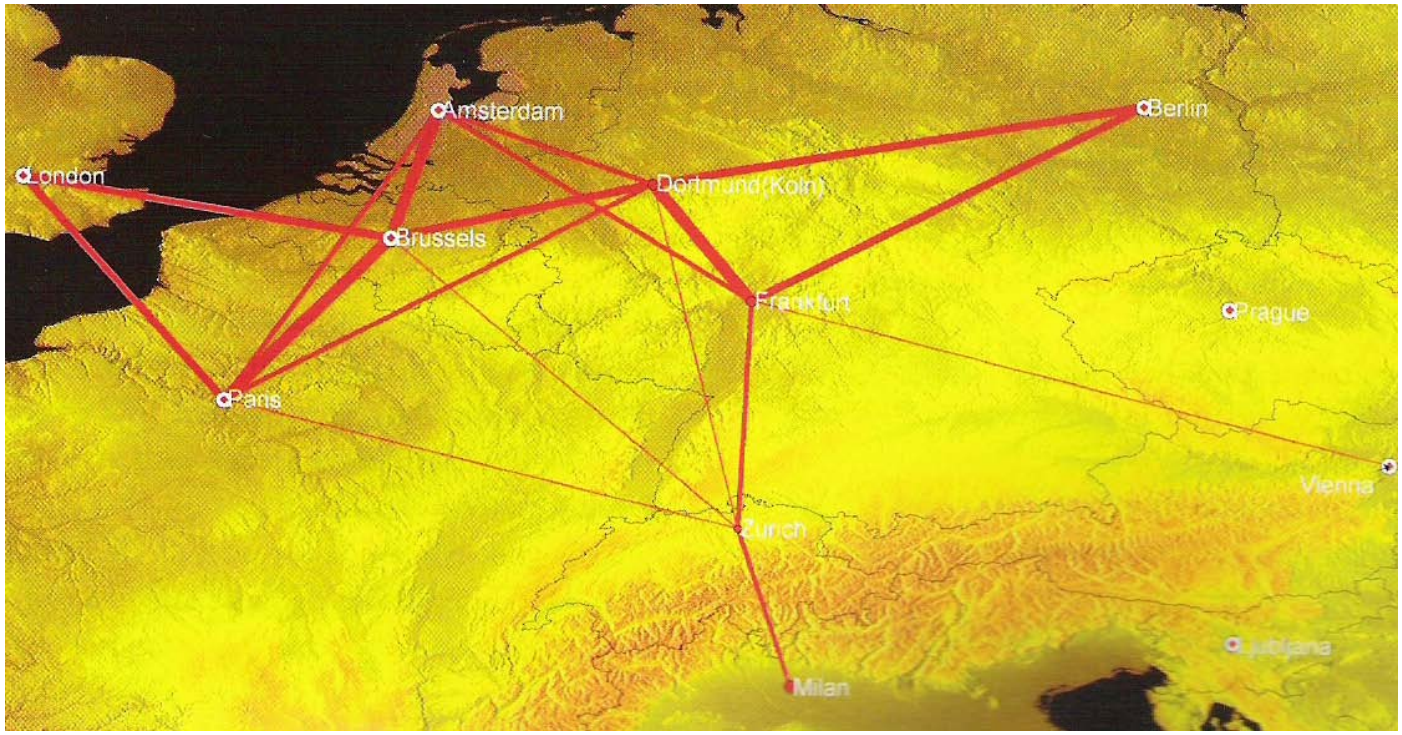
Air connectivity, autumn 2003 POLYNET

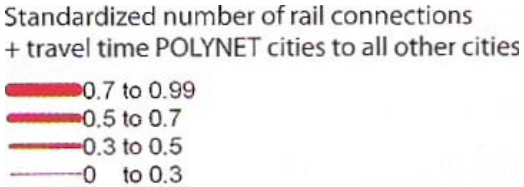
The figure shows a pattern of **very dense interconnections within the eight MCRs of North West Europe**, save only where they are affected by rail competition, as previously discussed.
It also demonstrates the degree to which **connectivity of all these regions and other European capital diminished very sharply towards the EU periphery**, especially towards the new accession countries of East Central Europe, which can presently be characterized as only very partially integrated into the European system of face-to-face information exchange. This may change as a result of new services from low-cost airlines like *easyJet* and *Rynair*, both of which were actively developing new links .

+ About urban models

*Poly – Centrism
The Mega City Regions

The analysis of travel movements :: **Train movements**





Rail connectivity, autumn 2003
POLYNET

Rail connectivity is quite skeletal**, dominated by a handful of major – city connections. Within the eight MCRs** (Mega City Regions) , these are London-Paris, London-Brussels, Paris-Brussels, Brussels-Amsterdam and Amsterdam-Dusseldorg-Frankfurt. These reflect existing high-speed connections.
Outside this geographical frame, there are only three strong connections: Cologne-Berlin, Frankfurt-Berlin, and **Zurich-Milan**. The first two are internal connections within Germany between two of the eight MCRs and the capital city. The third is an interesting **cross-Alpine link** where an efficient rail link successfully competes with air over a relatively short distance.

3. AXIOM 3: TERRITORIES

+ About territorial analysis

+ Territorial analysis based on urban categories
  + Bio Physical component
  + Artificial component
  + Dynamic component

*Concepts/Indicators clarification

+ QUESTIONS

Which is the most effective categorie's system in which an "urban analysis" of trans-national scale can be made?

Which are the main common and disjunctive points from where is possible to compare two very different territorial realities, such as European Vs. Latin American???

Can one learn from the day-to-day experience, how to improve livability?

The city, and the territory understood as a stratum superposition, in time and space, has to be uncover in an onion-peeling-way: by layers., or in this case by categories that can lead to a comprehensive overview, that the mind will hopefully get together as a **reality.**

It is not possible to talk in general about facts, and even less about infrastructural development. There must be a reference to a specific case, contextualizing the analysis made with a well structured story of how did the case happened, and how is it that the territory chosen got to show determinate characteristics it show. Only in that way history makes sense and theories come to life and actually help to build the real world.

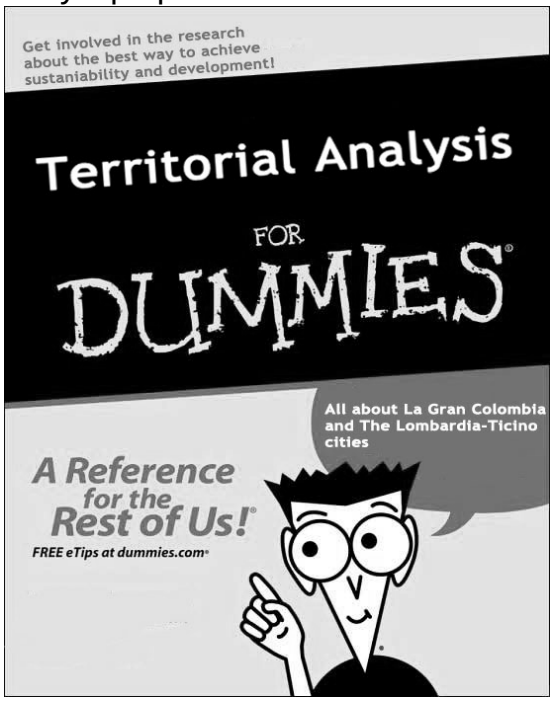
And what a better way to describe cities that from the inside, from the close attention to the phenomena on a daily and careless manner. This is the way this case studies are made: from the point of view of someone who has lived in both territories, and has paid enough attention to the dynamics, to the point of establishing some "initial points" to feedback both territories, and communicate from one side of the Atlantic to the other what's happening, and maybe, learn something from each other.

+ From the Alps to the Andes

As seen in the previous axioms, concepts can not be explained without naming specific context that link us with reality. The naming of cities and **comparison of realities** in this case, comprehends territories in a regional scale, understanding **REGIONAL** not as those delimitated by the political-administrative borders of municipalities/nations but as meaningful entities, slices of space that support communities, dynamics, and from where both urban and rural are born.

This chapter pretends to make two study cases of settlement models over the territories, that even if **very different in socio-cultural-political context** (such as Europe and Latin America) geographically are not that apart, and with the growing globalization – in the long sense of the term- are becoming every time more and more alike in their energies and life style proposals.

PD: This study cases have to be read keeping in mind, the importance of communicating the knowledge about – but not only- territory and livability in **the most comprehensive way, meaning simple, common and graphic languages,** using concepts that can be widely understood not only by architects or economist, the usual planners, but by any interested civilian, which could help to enrich the definition of Good City Form.



+ Territorial analysis

based on urban categories

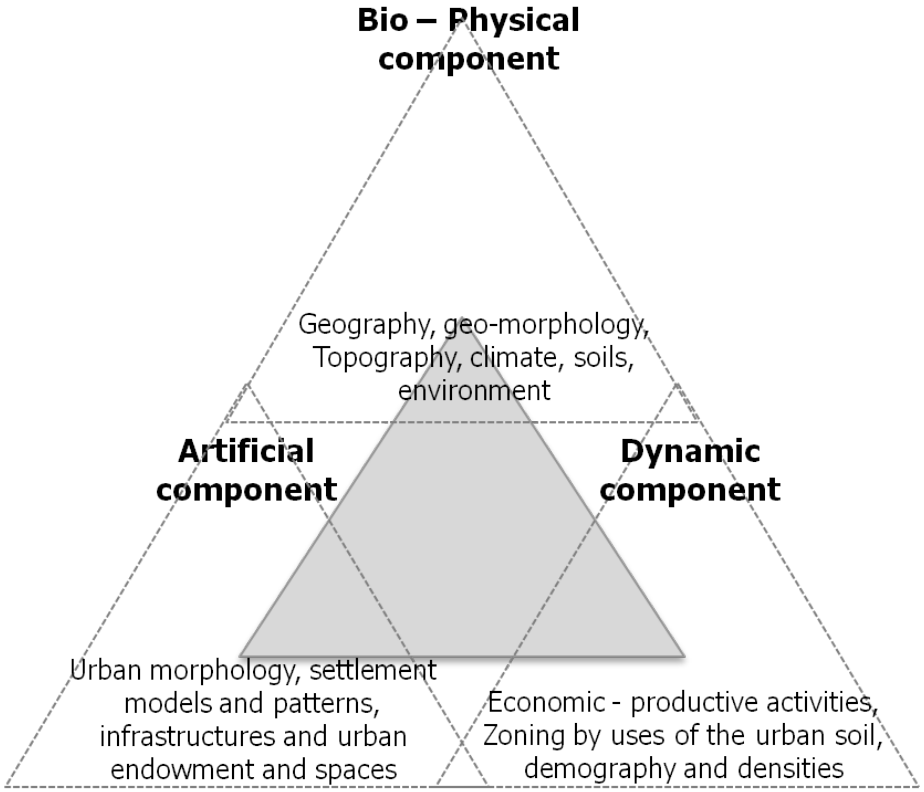
Analysis processes are basically the ones going from the more general concepts to the totally specific details. In order to understand a great theme or issue, which must be broken down in easy-digestive pieces of information, that can lead by putting the parts together to have a comprehensive vision of a given problem.
Territory is definitely a commonly used term, but lightly understood, so it is accurate to define what kind of territory one is talking about (as in the **axiom1**).
This analysis is made in categories, taken from the urban analysis made normally by architects and urbanist, separating the **complex-city** in layers, different skins that cover the surface of a determinate topography.

The regular categories such as geography, morphology, densities, populations, architectural forms, flows and connections, are grouped in 3 main components in which all this elements fit to explain the main characteristics of the territories chosen.

To understand the urban landscape of the contemporary era, it becomes necessary to think that there are no purities anymore, that reality is made of the mixing, superposition of models and shapes, of styles and ways of life, that at the end create settlement models.

This is to think about
the Architecture of Landscape and city.

Geography
Morphology
Landscape
Society
Infrastructures

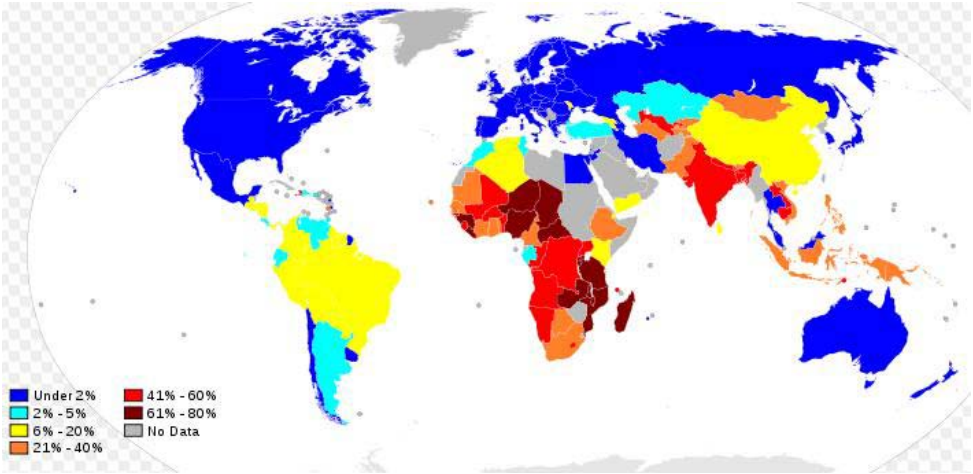


*Concepts/Indicators clarification

Population under poverty line

The **poverty threshold**, or **poverty line**, is the minimum level of income deemed necessary to achieve an adequate standard of living in a given country. In practice, like the definition of poverty, the official or common understanding of the poverty line is significantly higher in developed countries than in developing countries. The common **international poverty line** has in the past been roughly $1 a day. In 2008, the World Bank came out with a revised figure of $1.25 at 2005 purchasing-power parity (PPP).

Using a poverty threshold is problematic because having an income marginally above it is not substantially different from having an income marginally below it: the negative effects of poverty tend to be continuous rather than discrete, and the same low income affects different people in different ways. To overcome this problem, poverty indices are sometimes used instead; see income inequality metrics. A poverty threshold relies on a quantitative or purely numbers-based, measure of income. If other human development-indicators like health and education are used, they must be quantified, which is not a simple (if even achievable) task.



Percentage population living on less than $1.25 per day 2009. UN data

GDP

The **gross domestic product** (**GDP**) or **gross domestic income** (**GDI**) is a measure of a country's overall economic output. It is the market value of all final goods and services made within the borders of a country in a year. It is often positively correlated with the standard of living, though its use as a stand-in for measuring the standard of living has come under increasing criticism and many countries are actively exploring alternative measures to GDP for that purpose.

This indicator measures the GDP or value of all final goods and services produced within a nation in a given year. A nation's GDP at purchasing power parity (PPP) exchange rates is the sum value of all goods and services produced in the country valued at prices prevailing in the United States. This is the measure most economists prefer when looking at per-capita welfare and when comparing living conditions or use of resources across countries. The measure is difficult to compute, as a US dollar value has to be assigned to all goods and services in the country regardless of whether these goods and services have a direct equivalent in the United States. As a result, PPP estimates for some countries are based on a small and sometimes different set of goods and services. In addition, many countries do not formally participate in the World Bank's PPP project that calculates these measures, so the resulting GDP estimates for these countries may lack precision. For many developing countries, PPP-based GDP measures are multiples of the official exchange rate (OER) measure.

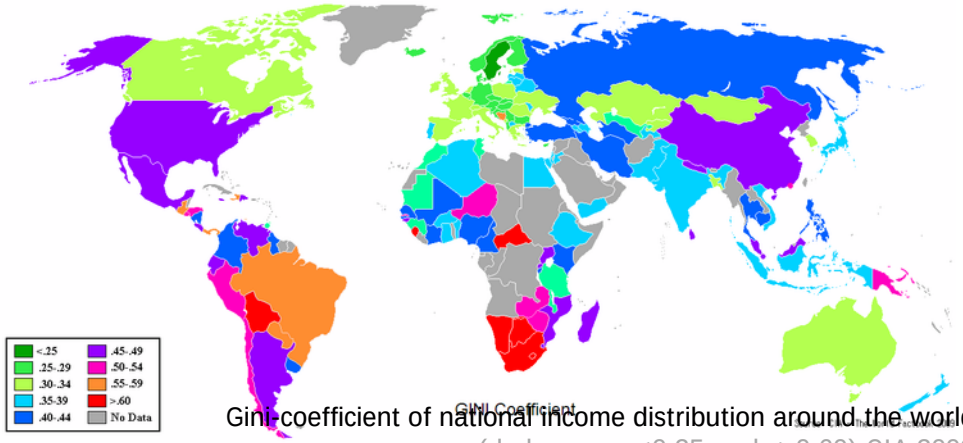
Urban density

Term used to refer to the number of people inhabiting a given urbanized area. + It is commonly asserted that higher density cities are more sustainable than low density cities because of the low consumption of land: every person has a rationally permitted volume according to the available and livable land in the world and the number of humans willing to inhabit it; So, why using more than that?

*Concepts/Indicators clarification

Literacy
UNESCO defines literacy as the "ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society.“

Gini coefficient
Is a measure of statistical dispersion developed by the Italian statistician Corrado Gini and published in his 1912 paper "Variability and Mutability“. The Gini coefficient is a measure of the inequality of a distribution, a value of 0 expressing total equality and a value of 1 maximal inequality. Although it is sometimes multiplied by 100 to range between 0 and 100.
A low Gini coefficient indicates a more equal distribution, with 0 corresponding to complete equality, while higher Gini coefficients indicate more unequal distribution, with 1 corresponding to complete inequality. It is commonly used as a measure of inequality of income or wealth. Worldwide, Gini coefficients for income range from approximately 0.23 (Sweden) to 0.70 (Namibia) although not every country has been assessed.



Gini-coefficient of national income distribution around the world
(dark green: <0.25, red: >0.60) CIA 2009

Human Development Index (HDI)
Is a composite statistic used to rank countries by level of "human development" and separate developed (high development), developing (middle development), and underdeveloped (low development) countries. The statistic is composed from data on life expectancy, education and per-capita GDP (as an indicator of standard of living) collected at the national level using the formula given in the Methodology section below.
The HDI combines three dimensions:
Life expectancy at birth, as an index of population health and longevity
Knowledge and education, as measured by the adult literacy rate (with two-thirds weighting) and the combined primary, secondary, and tertiary gross enrollment ratio (with one-third weighting).
Standard of living as indicated by the natural logarithm of GDP per capita, at purchasing power parity.
The origins of the HDI are to be found in the United Nations Development Programme's (UNDP) Human Development Reports (HDRs). These were devised and launched by Pakistani Economist Mahbub ul Haq in 1990 and had the explicit purpose: **“to shift the focus of development economics from national income accounting to people centered policies”**

3. AXIOM 3: TERRITORIES

+ Sample territories:

+ The Lombardia – Ticino city

+ Location
+ Territorial facts
+ Bio Physical Component
+ Geography
+ Dynamic Component
+ Between economy and society
+ Where people reside : Traditional boundaries
+ Where people reside: Dynamic boundaries
+ Where people work
+ How people move
+ Artificial Component
+ Morphology
+ Settlement model
+ Landscape
+ Infrastructures
+ Layers/subsystems
+ Pedemontana Highway
+ A railway story
+ Transportation in Milano Centre

LOMBARDIA - TICINO CITY

NORTHERN - ANDEAN CITY

+ Location
European Union

Political centres	Brussels Luxembourg Strasbourg
Official languages	23 [show]
Demonym	European[4]
Member States	27 [show]

Area	
-Total	4,324,782 km² 1,669,807 sq mi
-Water (%)	3.08
Population	
-2010 estimate	501,259,840[5]
-Density	115.9/km² 300.2/sq mi
GDP (PPP)	2009 (IMF) estimate
-Total	$14.793 trillion
-Per capita	$29,729
GDP (nominal)	2009 (IMF) estimate
-Total	$16.447 trillion
-Per capita	$33,052
Gini (2009)	30.7 (EU25)[6] (High)
HDI (2007)	0.937 (High)
Currency	Euro + 13 [show]

The European Union (EU) is an economic and political union of 27 member states which are located primarily in Europe. Committed to regional integration, the EU was established by the Treaty of Maastricht in 1993 upon the foundations of the European Communities. With over 500 million citizens, the EU generated an estimated 28% share (US$ 16.5 trillion) of the nominal and about 21% (US$14.8 trillion) of the PPP gross world product in 2009.

+ Location
Italia

Location of **Italy** (dark green)
– on the European continent (green & dark grey)
– in the European Union (green) — [Legend]

Capital (and largest city)	Rome 41°54′N 12°29′E
Formation	
- Unification	17 March 1861
- Republic	2 June 1946
EU accession	25 March 1957 (founding member)
Area	
- Total	301,338 km^2 (71st) 116,346 sq mi
- Water (%)	2.4
Population	
- April 2010 estimate	60,418,711[3] (23rd)
- 2001 census	56,995,744
- Density	200.5/km^2 (54th) 519.3/sq mi
GDP (PPP)	2009 estimate
- Total	$1.740 trillion[4]
- Per capita	$29,109[4]

The Italian Republic is a country located partly on the continental part of Europe and partly on a Peninsula in Southern Europe and on the two largest islands in the Mediterranean Sea, Sicily and Sardinia. Italy shares its northern, Alpine boundary with France, Switzerland, Austria and Slovenia. The territory of Italy covers 301,338 km² and is influenced by a temperate seasonal climate. With 60.4 million inhabitants, it is the sixth most populous country in Europe, and the twenty-third most populous in the world. Italy's capital, Rome, was for centuries the political centre of Western civilization as the capital of the Roman Empire.

+ Repubblica Italiana Territorial facts

Ethnic groups:
Italian -small clusters of German, French, and Slovene in the north and Albanian and Greek in the south)
Religions:
Roman Catholic 90% other 10% (includes mature Protestant and Jewish communities and a growing Muslim immigrant community)
Languages:
Italian (official)
Literacy:
total population: 98.4%
Education expenditures:
4.5% of GDP (2005)

Area:
total: 301,340 sq km, includes Sardinia and Sicily
Climate:
predominantly Mediterranean; Alpine in far north; hot, dry in south
Natural resources:
coal, mercury, zinc, potash, marble, barite, asbestos, pumice, fluorspar, feldspar, pyrite (sulfur), natural gas and crude oil reserves, fish, arable land
Natural hazards:
regional risks include landslides, mudflows, avalanches, earthquakes, volcanic eruptions, flooding; land subsidence in Venice
Environment - current issues:
air pollution from industrial emissions such as sulfur dioxide; coastal and inland rivers polluted from industrial and agricultural effluents; acid rain damaging lakes; inadequate industrial waste treatment and disposal facilities
Population:
58,126,212 (July 2010 est.)
Population growth rate:
-0.047% (2010 est.)
Urbanization:
urban population: 68% of total population (2008)
rate of urbanization: 0.4% annual rate of change (2005-10 est.)
Administrative divisions:
15 regions and 5 autonomous regions
Regions: Abruzzo, Basilicata, Calabria, Campania, Emilia-Romagna, Lazio (Latium), Liguria, Lombardia, Marche, Molise, Piemonte (Piedmont), Puglia (Apulia), Toscana (Tuscany), Umbria, Veneto (Venetia)
Autonomous regions: Friuli-Venezia Giulia; Sardegna (Sardinia); Sicilia (Sicily); Trentino-Alto Adige (Trentino-South Tyrol) or Trentino-Suedtirol (German); Valle d'Aosta (Aosta Valley) or Vallee d'Aoste (French)

+ Repubblica Italiana Economic data

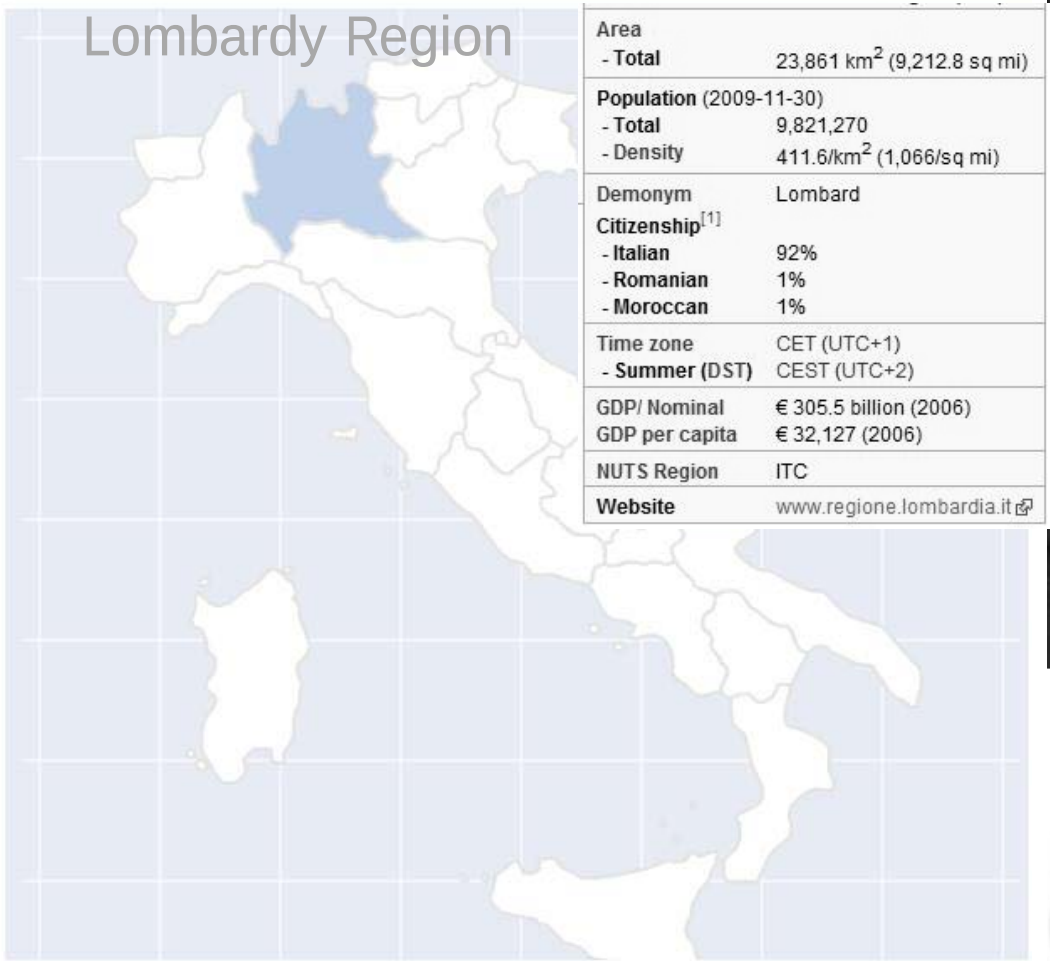
Italy has a diversified industrial economy, which is divided into a developed industrial north, dominated by private companies, and a less-developed, welfare-dependent, agricultural south, with high unemployment. The Italian economy is driven in large part by the manufacture of high-quality consumer goods produced by small and medium-sized enterprises, many of them family owned. Italy also has a sizable underground economy, which by some estimates accounts for as much as 15% of GDP. These activities are most common within the agriculture, construction, and service sectors. Italy has moved slowly on implementing needed structural reforms, such as reducing graft, overhauling costly entitlement programs, and increasing employment opportunities for young workers, particularly women. These conditions will be exacerbated in the near-term by the global economic downturn, but in the longer-term Italy's low fertility rate and quota-driven immigration policies will increasingly strain its economy. The Italian government has struggled to limit government spending, but Italy's exceedingly high public debt remains above 115% of GDP, and its fiscal deficit - just 1.5% of GDP in 2007 - exceeded 5% in 2009 as the costs of servicing the country's debt rose. A tax amnesty program implemented in late 2009 to repatriate untaxed assets held abroad has netted the federal government more than $135 billion.

"... Persistent problems include illegal immigration, organized crime, corruption, high unemployment, sluggish economic growth, and the low incomes and technical standards of southern Italy compared with the prosperous north..."

GDP (purchasing power parity):
$1.739 trillion (2009 est.)
country comparison to the world: 11 $1.832 trillion (2008 est.)
note: data are in 2009 US dollars
GDP - composition by sector:
agriculture: 1.8%
industry: 25%
services: 73.1% (2009 est.)
Unemployment rate:
7.7% (2009 est.)
Population below poverty line:
NA%
Distribution of family income - Gini index:
32 (2006)
country comparison to the world: 101 27.3 (1995)
Investment (gross fixed):
18.9% of GDP (2009 est.)
country comparison to the world: 105
Agriculture - products:
fruits, vegetables, grapes, potatoes, sugar beets, soybeans, grain, olives; beef, dairy products; fish
Industries:
tourism, machinery, iron and steel, chemicals, food processing, textiles, motor vehicles, clothing, footwear, ceramics
Exports - commodities:
engineering products, textiles and clothing, production machinery, motor vehicles, transport equipment, chemicals; food, beverages and tobacco; minerals, and nonferrous metals
Exports - partners:
Germany 12.6%, France 11.57%, US 5.92%, Spain 5.69%, UK 5.13%, Switzerland 4.69% (2009)
Imports - commodities:
engineering products, chemicals, transport equipment, energy products, minerals and nonferrous metals, textiles and clothing; food, beverages, and tobacco
Imports - partners:
Germany 16.68%, France 8.82%, China 6.53%, Netherlands 5.63%, Spain 4.3%, Russia 4.12%, Belgium 4.08% (2009)

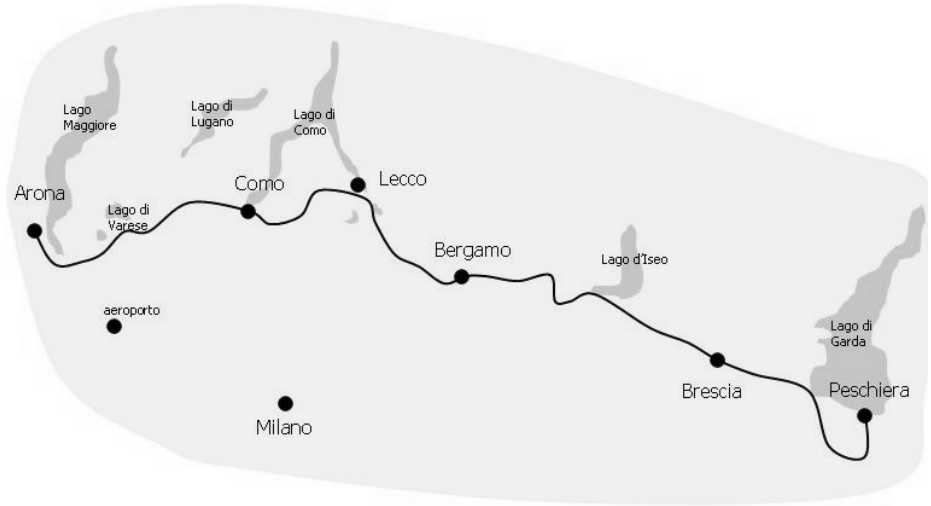
+ Location

Lombardy Region

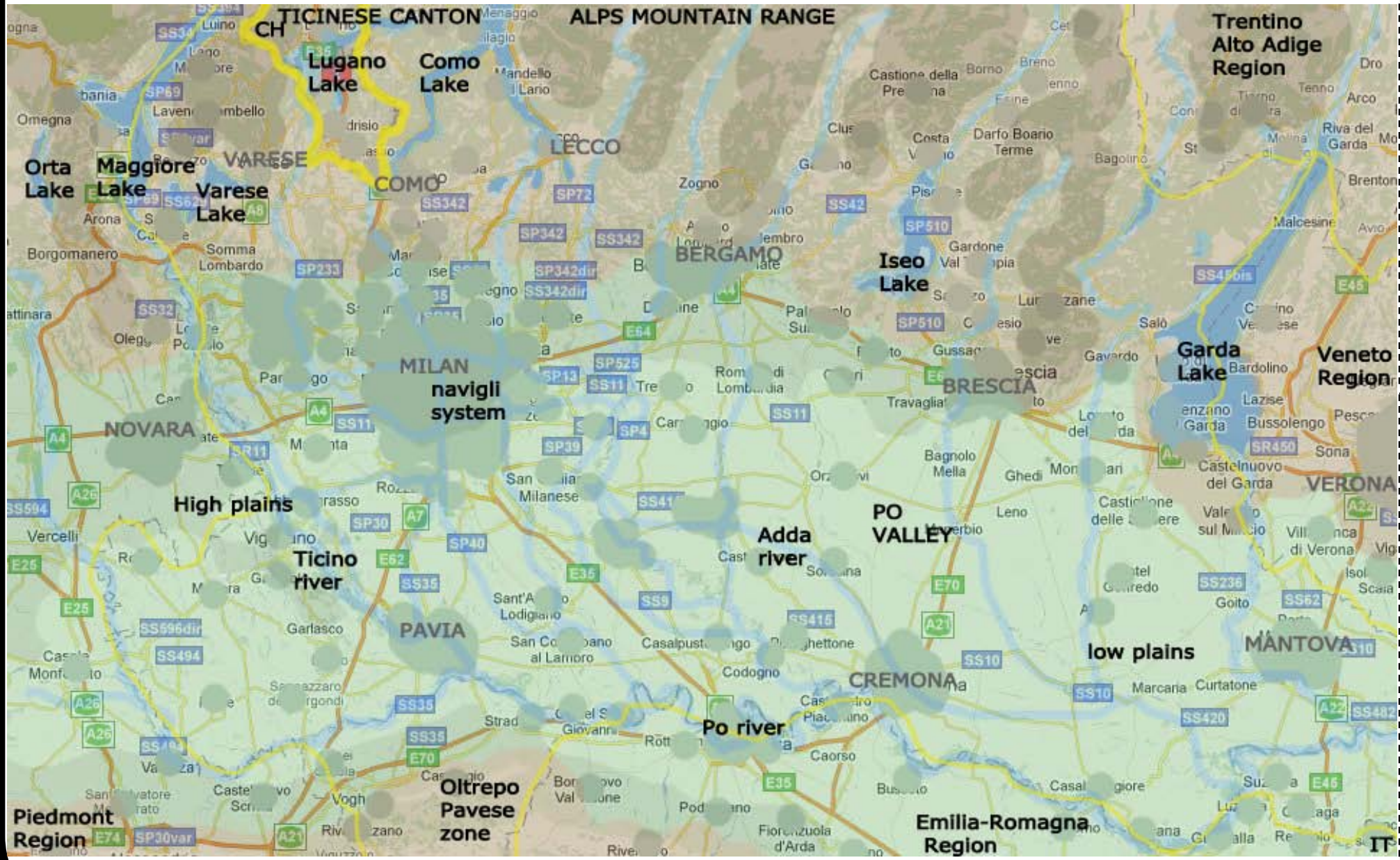


Area	
- Total	23,861 km^2 (9,212.8 sq mi)
Population (2009-11-30)	
- Total	9,821,270
- Density	411.6/km^2 (1,066/sq mi)
Demonym	Lombard
Citizenship[1]	
- Italian	92%
- Romanian	1%
- Moroccan	1%
Time zone	CET (UTC+1)
- Summer (DST)	CEST (UTC+2)
GDP/ Nominal	€ 305.5 billion (2006)
GDP per capita	€ 32,127 (2006)
NUTS Region	ITC
Website	www.regione.lombardia.it

Lombardy *is one of the 20 regions of Italy. The capital is Milan. One-sixth of Italy's population lives in Lombardy and about one fifth of Italy's GDP is produced in this region, making it the most populous and richest region in the country. Major* ***tourist*** *destinations in the region include the historic, cultural and artistic cities of* ***Milan*** *(which is Italy's second top tourist destination),Brescia, Mantua, Pavia, Cremona and Bergamo, and the* ***lakes*** *Garda, Como, Maggiore and Iseo.*



+ BIO PHYSICAL COMPONENT: Geography



+ BIO PHYSICAL COMPONENT: Geography

Three distinct natural zones can be fairly easily distinguished in the Lombardy region: mountains, hills and plains - the latter being divided in *Alta* (high plains) and *Bassa* (low plains).
The most important mountainous area is an Alpine zone including the Lepontine and Rhaetian Alps, (Piz Zupo, 3,996 m), the Bergamo Alps, the Ortles and Adamello massifs; it is followed by an Alpine foothills zone Prealpi, which include the main peaks are the Grigna Group (2,410 m), Resegone(1,875 m) and Presolana (2,521 m). The great Lombard lakes, all of glacial origin, lie in this zone. From west to east these are Lake Maggiore, Lake Lugano (only a small part is Italian), Lake Como, Lake Iseo, Lake Idro, then Lake Garda, the largest in Italy. South of the Alps lie the hills characterized by a succession of low heights of morainic origin, formed during the last Ice Age and small barely fertile plateaux, with typical heaths and conifer woods. A minor mountainous area lies south of the Po, in the Appennines range.
The plains of Lombardy, formed from alluvial deposits, can be divided into the *Alta* - an upper, permeable ground zone in the north and a lower zone characterized - the *Bassa* - by the so-called line of *fontanili* (the spring waters rising on impermeable ground). Anomalous compared with the three distinctions already made is the small region of the Oltrepò Pavese, formed by the Apennine foothills beyond the Po River. A large number of rivers, all direct or indirect tributaries of the Po, cross the plains of Lombardy. Major rivers, flowing west to east, are the Ticino, the outlet of Lake Maggiore, the Olona, the Lambro, the Adda, outlet of Lake Como, the Mincio, outlet of Lake Garda, and the Oglio, the Lake Iseo outflow. There is a wide network of canals for irrigation purposes. In the plains, intensively cultivated for centuries, little of the original environment remains. In the area of the great Alpine foothills lakes, however, grow olive trees, cypresses and larches, as well as varieties of subtropical flora such as magnolias, azaleas, acacias, etc.

The mountains area is characterized by the typical vegetation of the whole range of the Italian Alps. At a lower levels (up to approximately 1,100 m) oak woods or broadleafed trees grow; on the mountain slopes (up to 2,000–2,200 m) beech trees grow at the lowest limits, with conifer woods higher up. Shrubs such as rhododendron, dwarf pine and juniper are native to the summital zone (beyond 2,200 m). The climate of this region is continental, though with variations depending on altitude or the presence of inland waters. The continental nature of the climate is more accentuated on the plains, with high annual temperature changes (at Milan an average January temperature is 1.5 °C and 24 °C in July), and thick fog between October and February. The Alpine foothills lakes exercise a mitigating influence, permitting the cultivation of typically Mediterranean produce (olives, citrus fruit). In the Alpine zone, the valley floor is relatively mild in contrast with the colder higher areas (Bormio, 1,225 m, –1.4 °C average in January, 17.3 °C in July). Precipitations are more frequent in the Prealpine zone (up to 1,500–2,000 mm annually) than on the plains and Alpine zones (600 mm to 850 mm annually). Lombardy counts many protected areas: the most important are the Stelvio National Park (the largest Italian natural park), and the Ticino Valley Natural Park, instituted in 1974 on the Lombard side of the Ticino River to protect and conserve one of the last major examples of fluvial forest in Northern Italy.

Lombardy is often pointed out as one of the most polluted region in Europe and one of the more polluted in the world. Origin of pollution in Lombardy is from transportation, industries, other human activity and low wind circulation. Nitrogen dioxide and particulate are most pollutant agent in Lombardy. Joint Research Centre monitor this pollution every year and recently underlines 7000 dead every year due to pollution.

+ DYNAMIC COMPONENT:

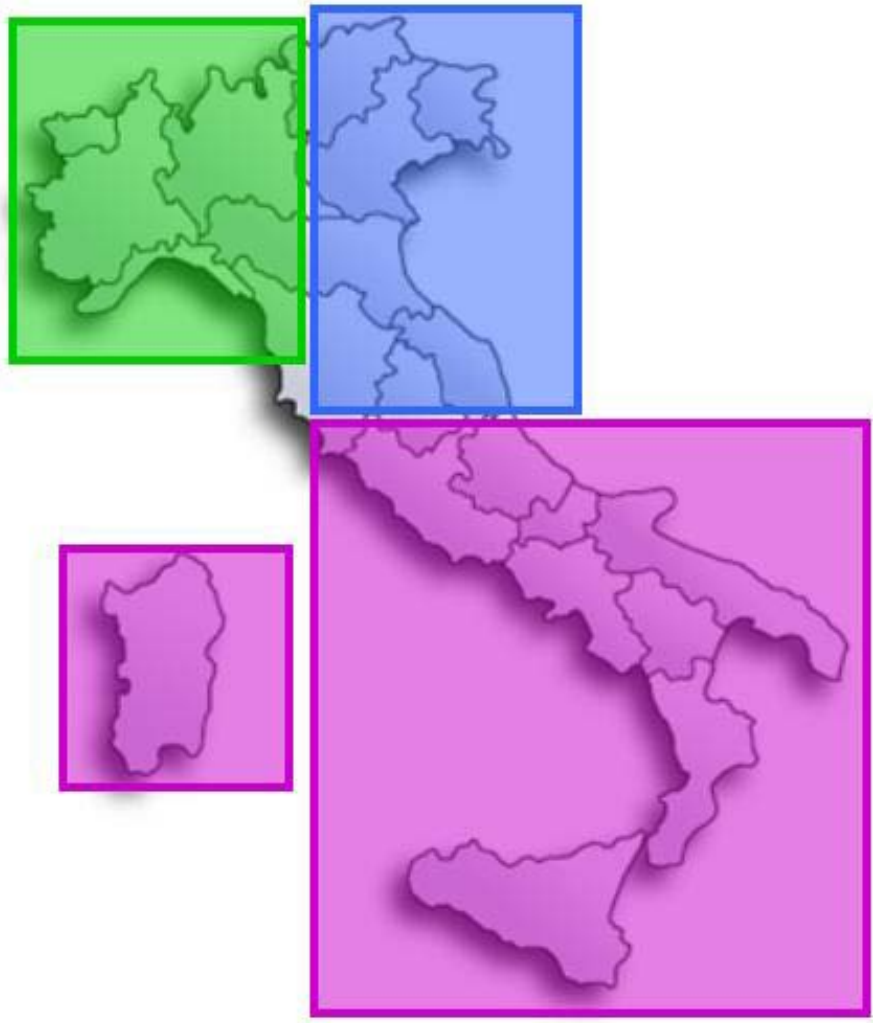
Between economy and society

The transformation of Lombardy from an industrial region into a slick, services-based economy has hugely benefited the local population, resulting in an influx of foreign investment and strong employment growth. It is one of the most prosperous areas in the whole of Europe, home to international names like Giorgio Armani and Prada. **T**hese firms enable Lombardy to maintain its competitive edge. The ability to react swiftly to the demands of international markets, a key requirement in the global economy, gives the region an added advantage. It also highlights Lombardy's distinctly pro-business stance. A number of industrial clusters have been established to encourage new business start-ups.

Lombardy remains competitive through innovation, technology, quality production, management, and research and development. Traditional sectors, like textiles and machinery, are taking advantage of advances in IT and e-commerce to maintain their position in domestic and international markets.

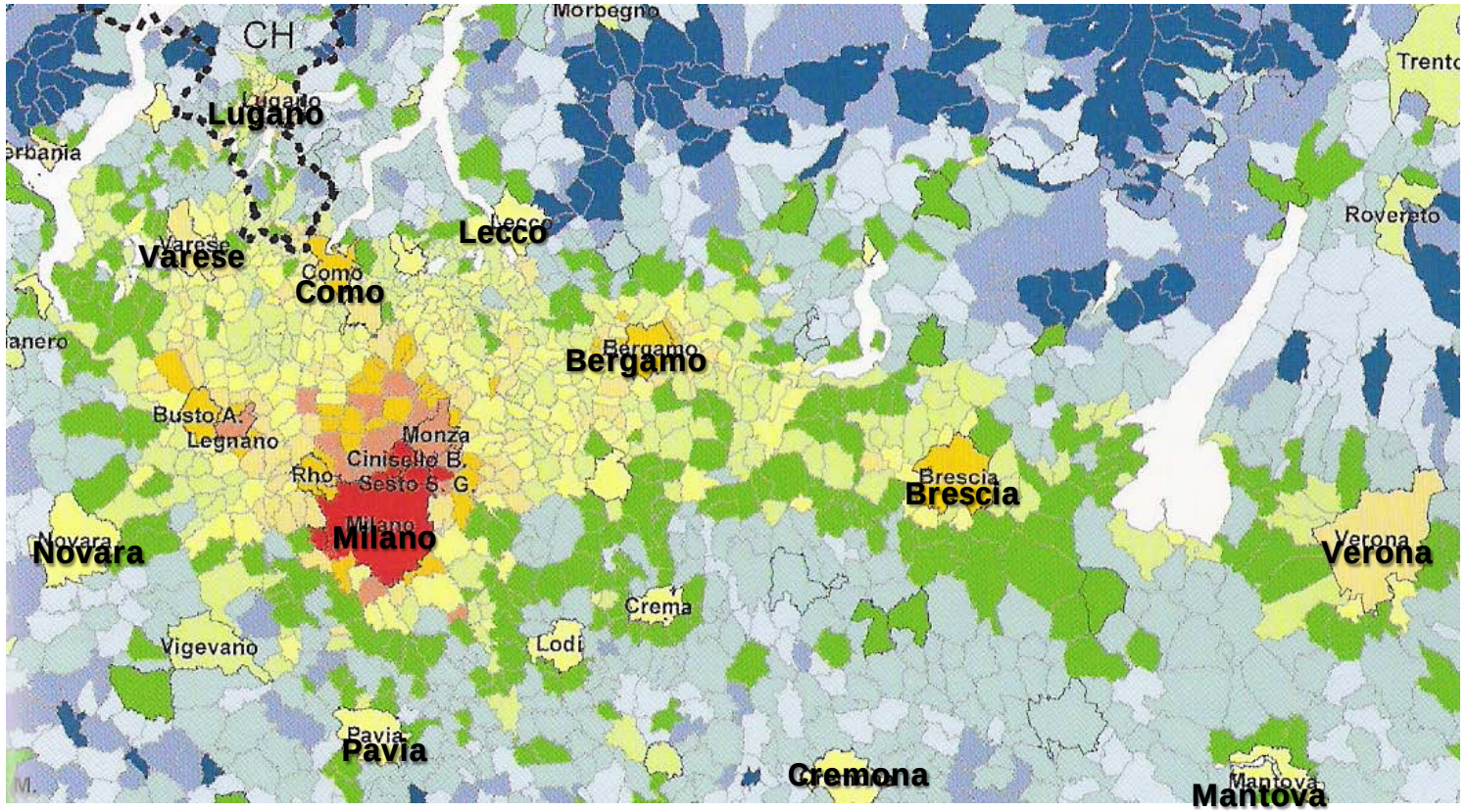
The Minister of Foreign Trade, Adolfo Urso, points out that the most important Italian companies are in Lombardy and that the possibilities for cooperation and commercial exchange are enormous. "Lombardy is very attractive to foreign investors and the institutional set-up is fast and efficient," he says. Northern Italy is the most developed and productive area of the country, and home to the first part of Italy to be industrialized in the last half of the 19th century, the so called *industrial triangle* formed by the manufacturing centres of Milan and Turin and the seaport of Genoa, the green part in the picture. The blue part of the Italy represents the part of Italy named "Terza Italia" (Bagnasco 1971). This part of territory is characterized by small

Since the 1980s, the term has become connotated with an important element of dynamic industrial development in Northern Italy, where after the Second World War clusters of small and medium-sized enterprises (SME) experienced strong growth. Industrial districts in Northern Italy have a coherent location and a narrow specialization profile, e.g. Prato in woolen fabric, Sassuolo in ceramic tiles or Brenta in ladies' footwear.



The success of SME-based Italian districts was one of the many factors that motivated undereducated economic development organizations across the world to adopt cluster promotion as an approach to stimulate growth and job creation.

More recently, Italian industrial districts have been linked to Italy's poor growth performance. Firms in industrial districts battle to internationalize production, and they have only limited resources to invest in research and development.



Legend

Inhabitants/kmq

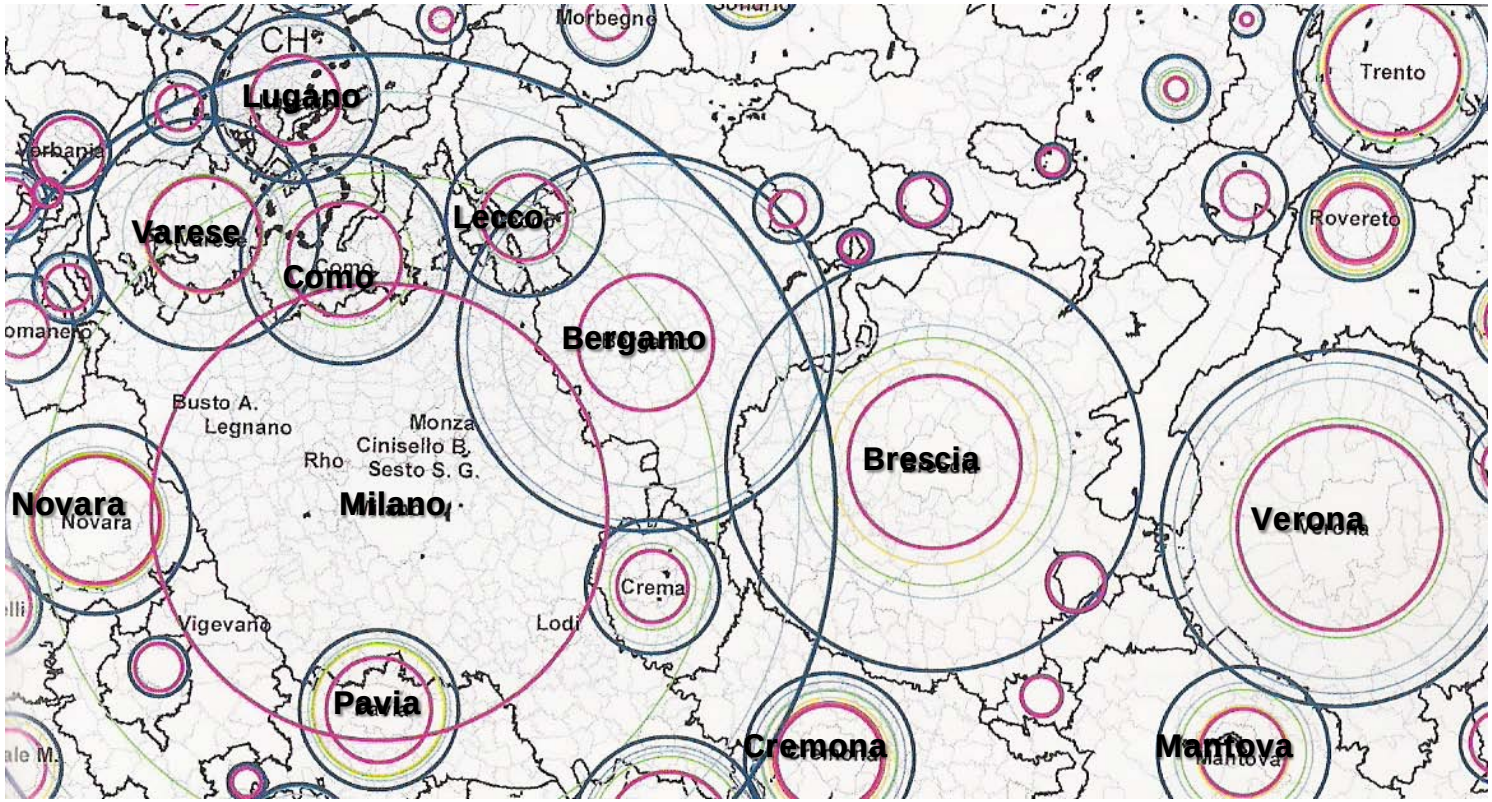
0,94 – 25,00	
25,01 – 50,00	
50,01 – 100,00	
100,01 – 250,00	
250,01 – 500,00	
500,01 – 800,00	
800,01 – 1300,00	
1300,01 – 2000,00	
2000,01 – 3000,00	
300,01 – 5000,00	
5000,01 – 8000,00	
8000,01 – 1234,64	

Resident population density for municipalities - 2006

Resident Population Density

The traditional administrative boundaries have lost most of their meanings to describe or encompass urban phenomena. Fot these reasons this set of maps can clearly show what the polycentric Lombardia – Ticino region is.
First of all the maps comprehends territory around Lombardy, such as other close Italian regions but also non Italian regions : the **Ticino** region is involved in these urban systems model because of geographical compares , a similar economical structure and settlement model.

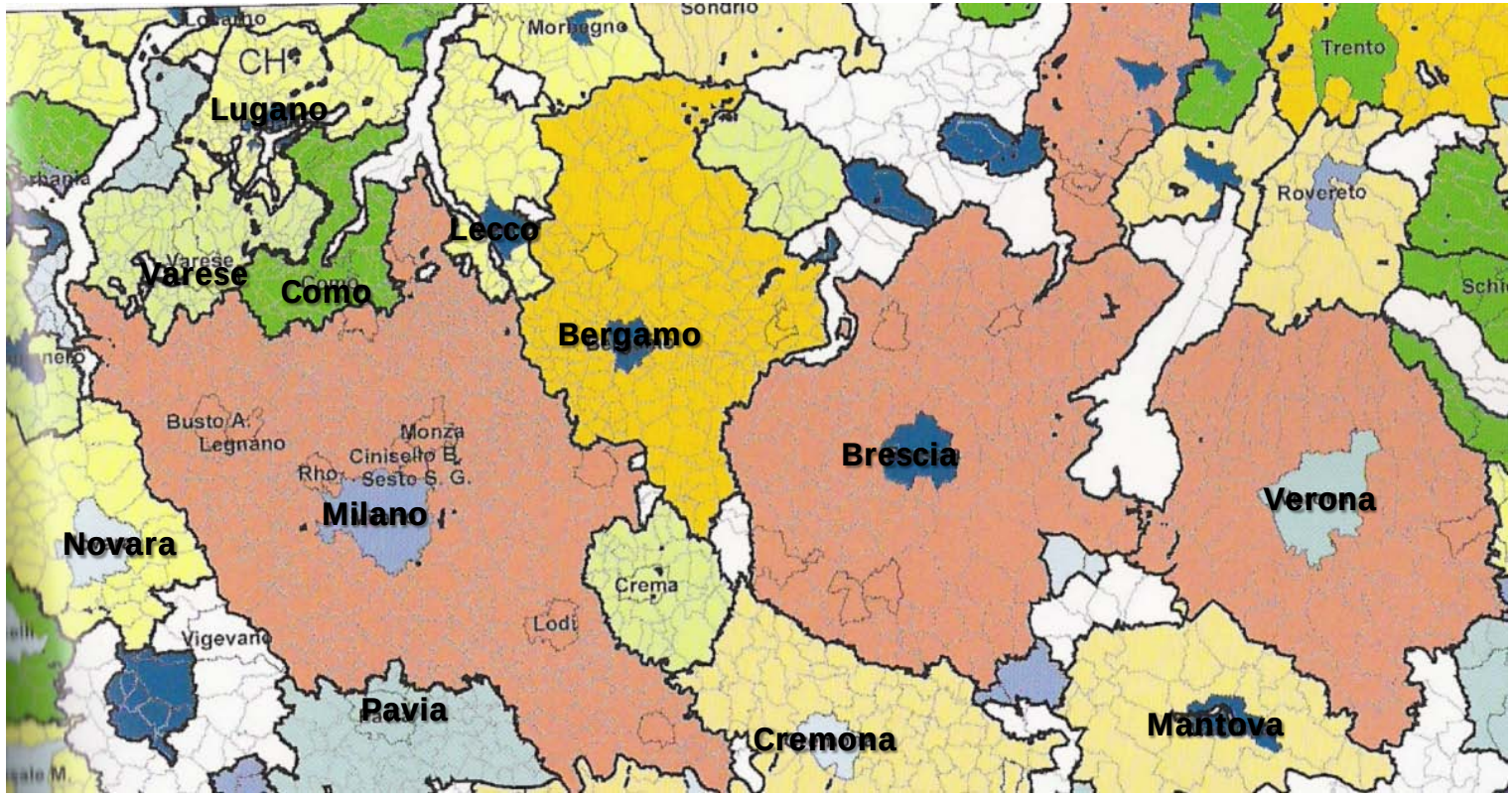
This map is a measurement of population per unit area. In particular it can help to **easily recognize the main urban system**: the nodes of the urban system registers a higher number of inhabitants per kmq.



Resident population in the Urban System - 2006

Resident Population in the Urban Systems

By using this particular reading of the territory you can see clearly the urban system: the circle means the population is concentrated around the same node we saw in previous images.
The main cities already individuated like a nodes of a particular zone are represented by circles with different colors : the different colors mean the different possibility of representing the urban systems, from 100 aggregate municipalities until 6000 aggregated.



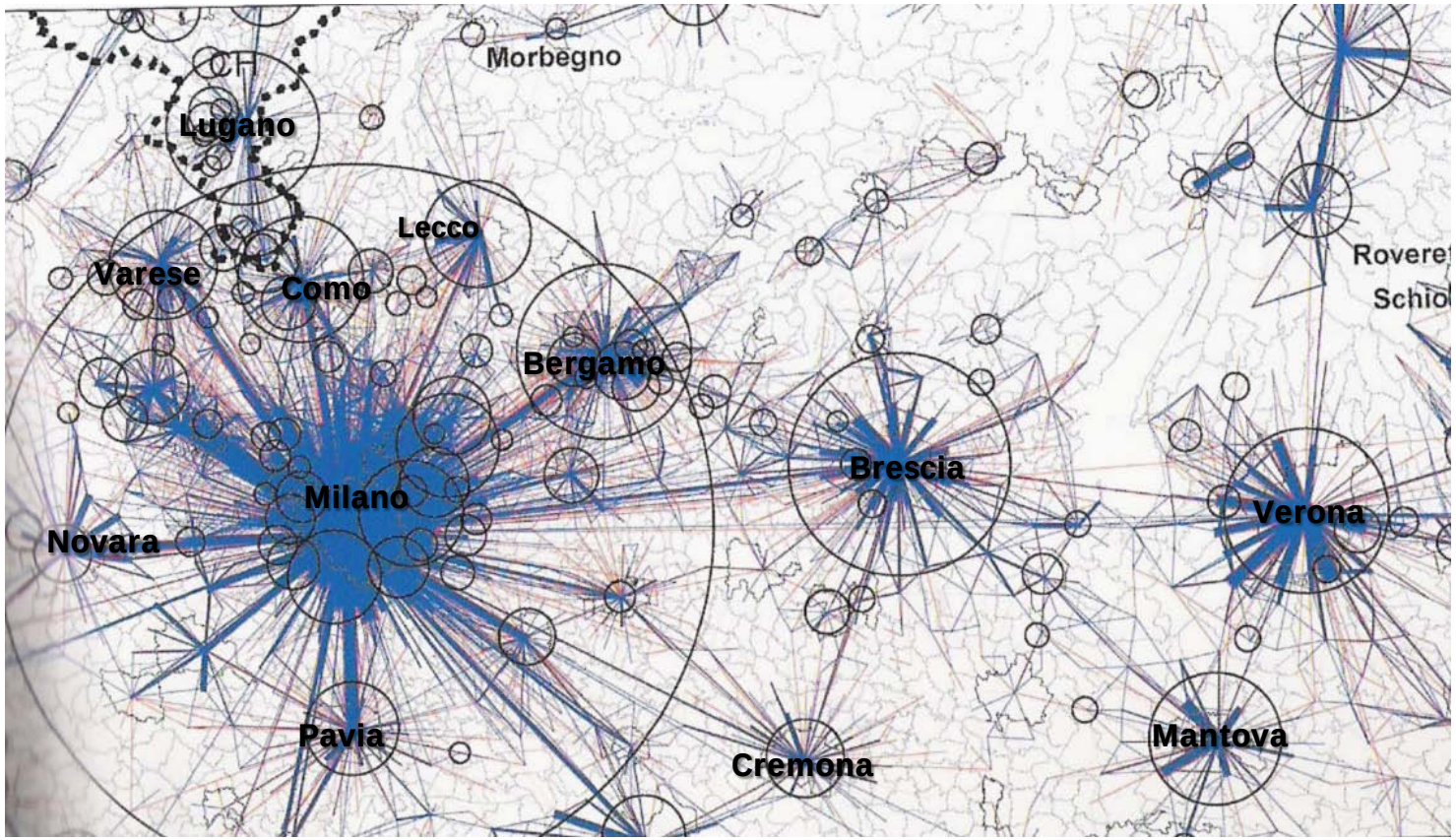
Legend

Percentage %	
26,41 – 50,00	
50,01 – 55,00	
55,01 – 55,00	
55,01 – 60,00	
60,01 – 65,00	
65,01 – 70,00	
70,01 – 75,00	
75,01 – 80,00	
80,01 – 85,00	
85,01 – 90,00	
90,01 – 93,00	
93,01 – 96,00	
96,01 – 97,35	

Urban System and containment index of workers and students flow. 6000 aggregated municipalities - 2001

Urban System and Self – containment

This index measures the capacity of a municipality to give a job to his resident population.
Usually the capoluogo of the Provincia is individuate like a node of his own system.
But at the same time the city does not offer a sufficient numbers of emploies. It means that is necessary for people to move from chief city towards the urban system., the same or outside of that one.
For example Milan city has a low index, but the urban system of Milan measures level of self-containment close to complete self-containment.
The urban system of Pavia, on the other hand , presents an index of 50%, it means that workers has to move in other system to get a job.

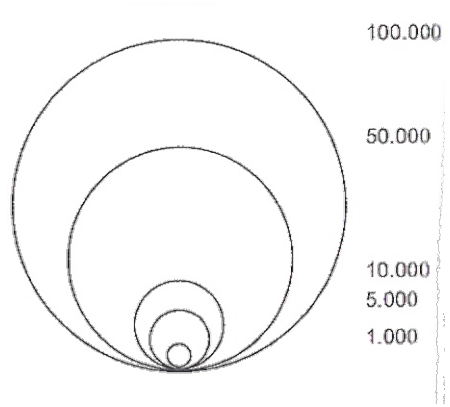


Legend

Workers and students flow

100
500
1.000
2.500
5.000
7.500
10.000

Surplus employ. Absolute numbers



Workers flow

Workers and students flow

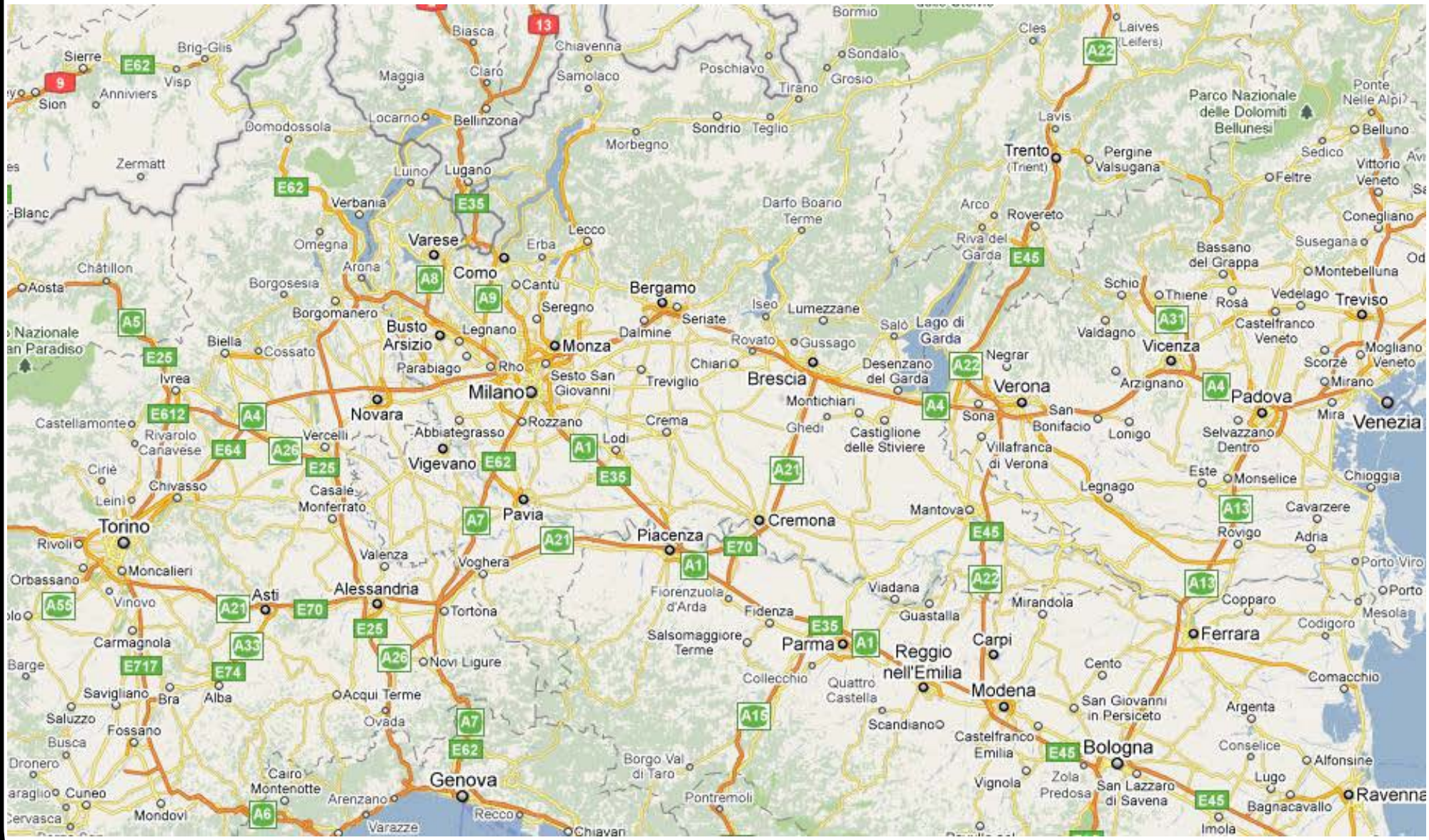
Workers and students ' commuting flow - 2001

Commuting

The analysis of the movements of commuting flows helps perfectly to clarify the importance of efficient infrastructure.
The nodes of the net are always the same, so , **one of the most important issue for a good governance and for an efficient set of territorial polities** will be to offer and to create a **strong and integrated system of public infrastructures**, dissimulating use of private car by accurate policies.

+ ARTIFICIAL COMPONENT: Morphology

The Lombardia – Ticino City
The Torino – Venezia Urban Continuum
The North Italy Mega City Region

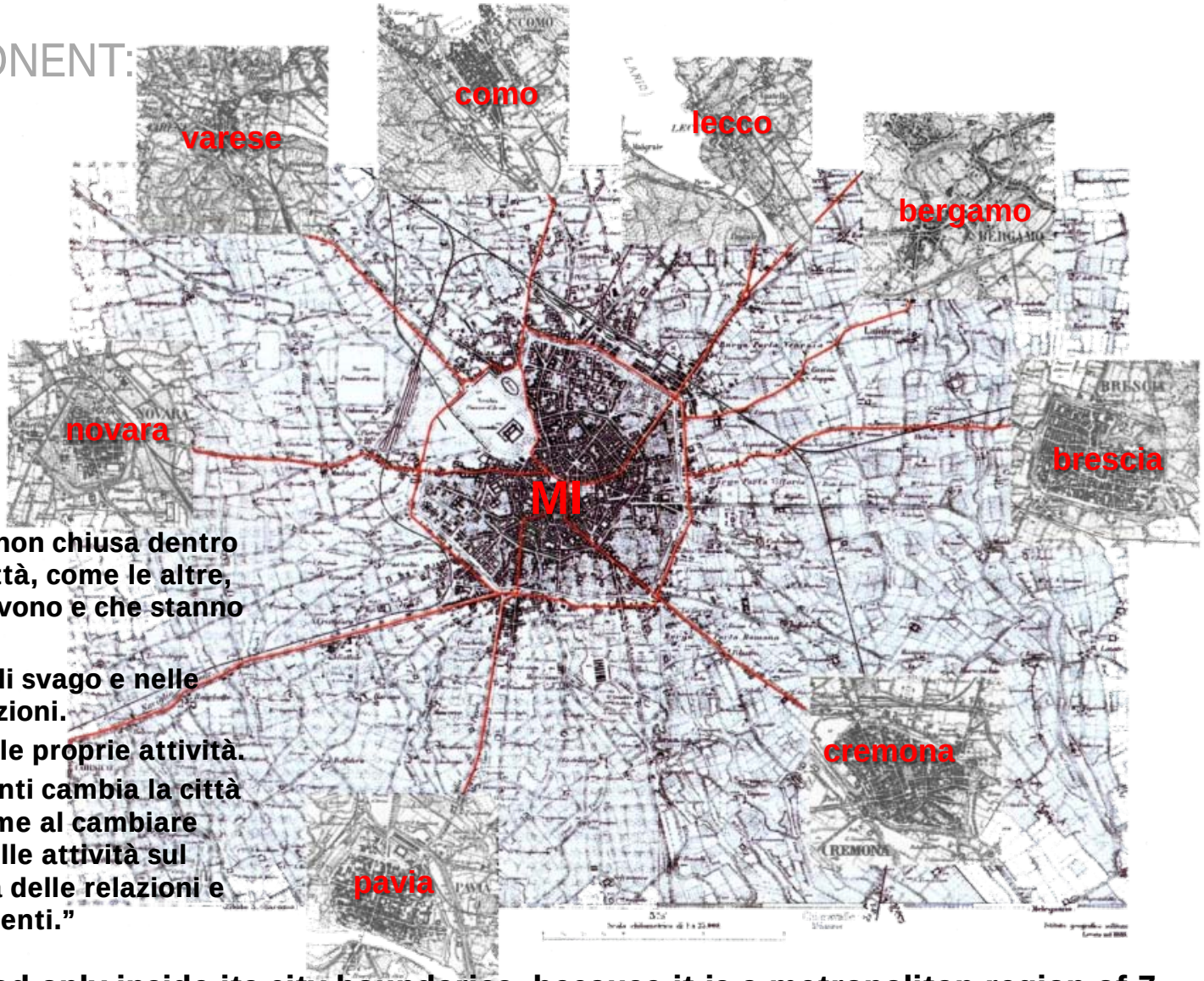


NORTHERN ANDEAN CITY

LOMBARDIA - TICINO CITY

+ ARTIFICIAL COMPONENT:

Morphology



Lombardia come grande città non chiusa dentro rigidi confini "daziari": città, come le altre, fatta di uomini che si muovono e che stanno fermi.

Fermi nei luoghi di lavoro, di svago e nelle proprie abitazioni.

In movimento per organizzare le proprie attività.

Ed al cambiare degli spostamenti cambia la città e la sua forma, così come al cambiare dell'organizzazione delle attività sul territorio muta il sistema delle relazioni e degli spostamenti."

Milan can not be understood only inside its city boundaries, because it is a metropolitan region of 7 million of people

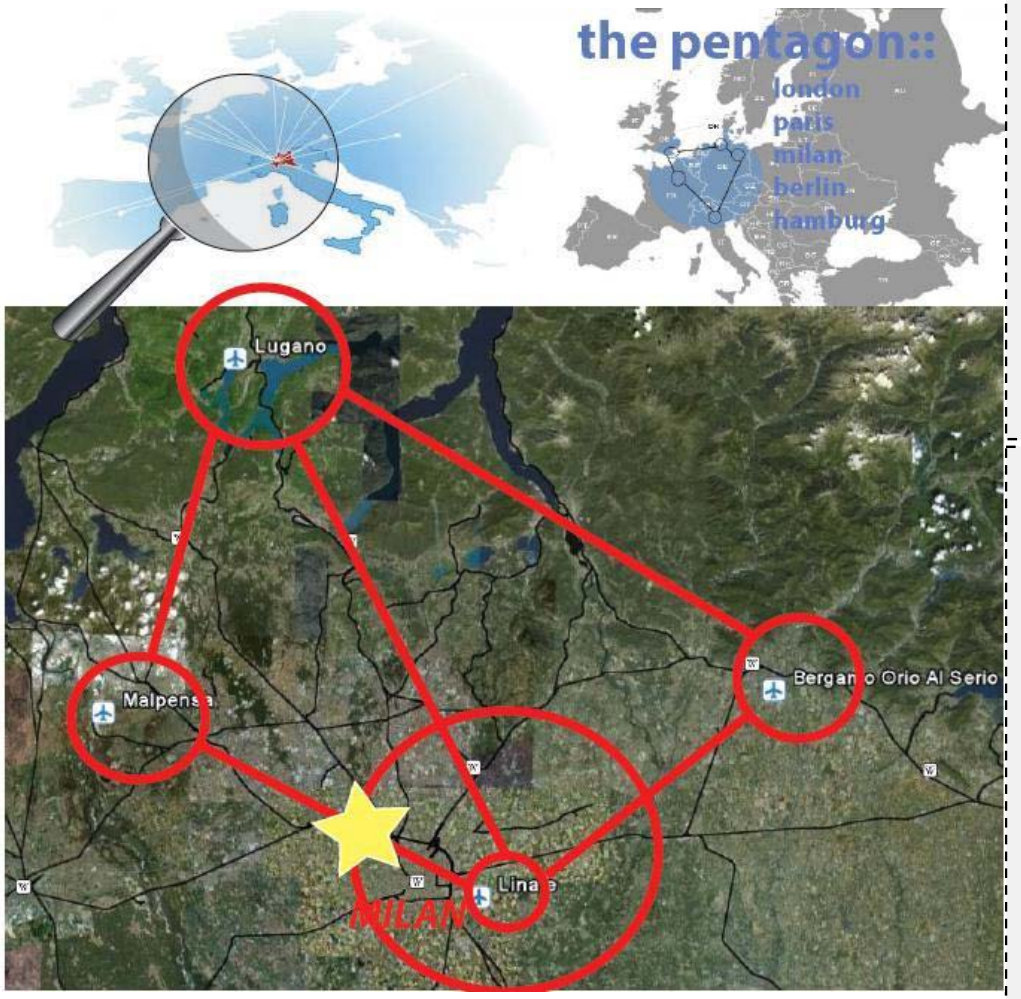
The Polycentric City extendes throughout the region, enlarging on the main axis of transportation: the railway and the main rodaways, such as the A4 highway, connecting Torino and Milano.

Milan is a decentralized city of 7milion people, supported by an efficient railway network, made accessible in a 1-hour-time trip, providing a complex ecology of functions, that is a variety of activities for economic life as well as for culture and leisure.

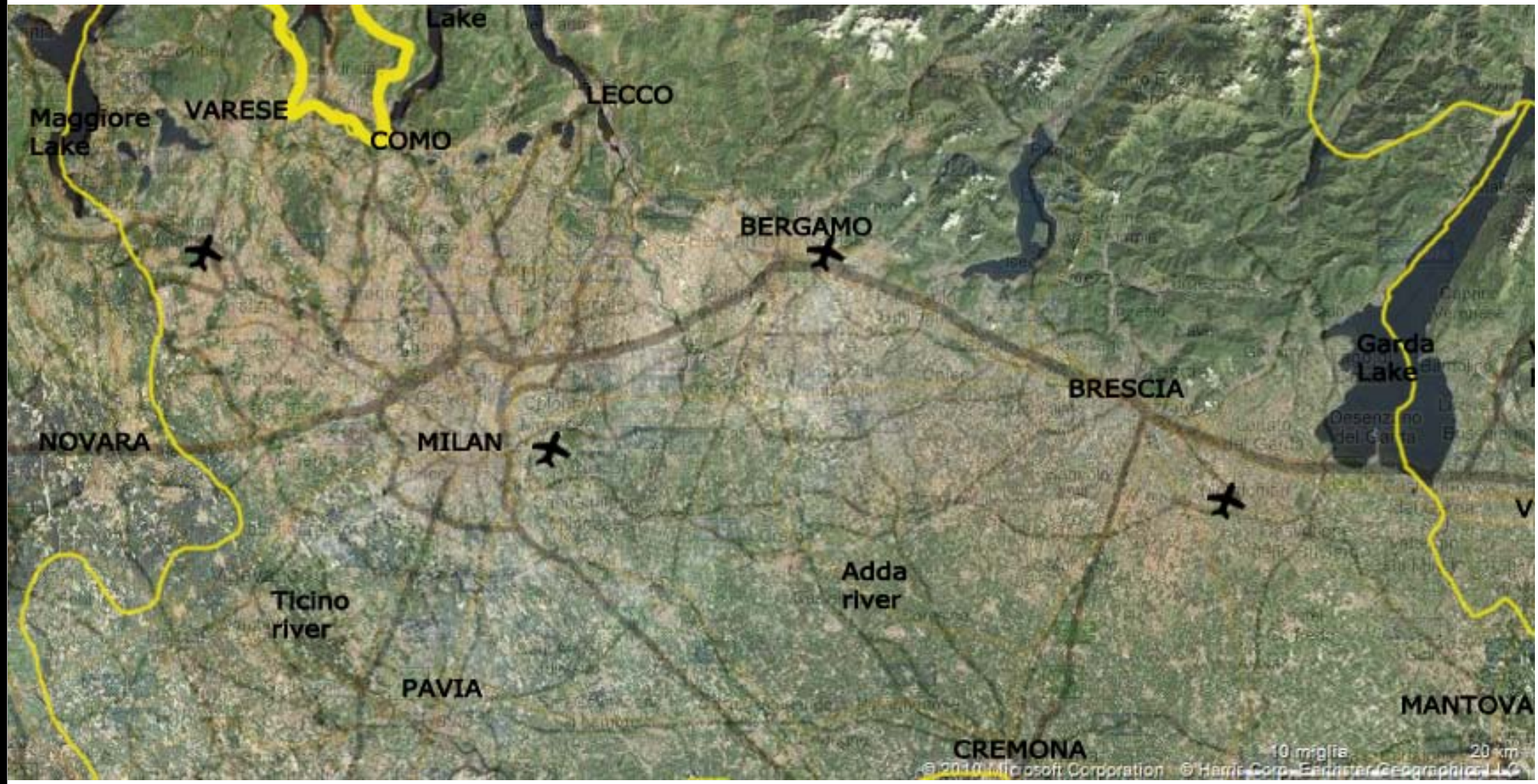
+ ARTIFICIAL COMPONENT: Settlement model

The Lombardy territory is strictly linked of the geography, landscape and morphology of the nearby regions, delimitated politically.
But the cities involved in this particular system of Lombardia-Ticino, don't follow the traditional boundaries, because the adminitrative and political systems are not the same of the real dynamics.
The territory between the Ticino region in Switzerladn and the Lombardia region of Italy, present lots of common features such as:
The closeness to Alps
The closeness to the system of lakes of the north Italy
The closeness to the "European pentagon" cities, specially with the presence of Milano as the main attractive pole of the system
An Integrated system of infrastructures , with a complex railway and roadway systems
The presence of a portuary system, made of important international airports and water ports.
The presence of commuters around of some specific nodes of the network
Emerging nodes of the net (Milan in the middle, and than Como, Lecco, Brescia, Bergamo, Padova; Verona, Venezia)

It is impossible consider Milan as the chief town of Lombardy, as an isolated element, without the strong net of cities, infrastructures and social features that it has in common with the big metropolitan region of Lombardia – Ticino.
The analysis of this territory can not finish inside of the Italian boundary, because of the similar structure of the border cities, such as Como (IT), Lugano (CH)

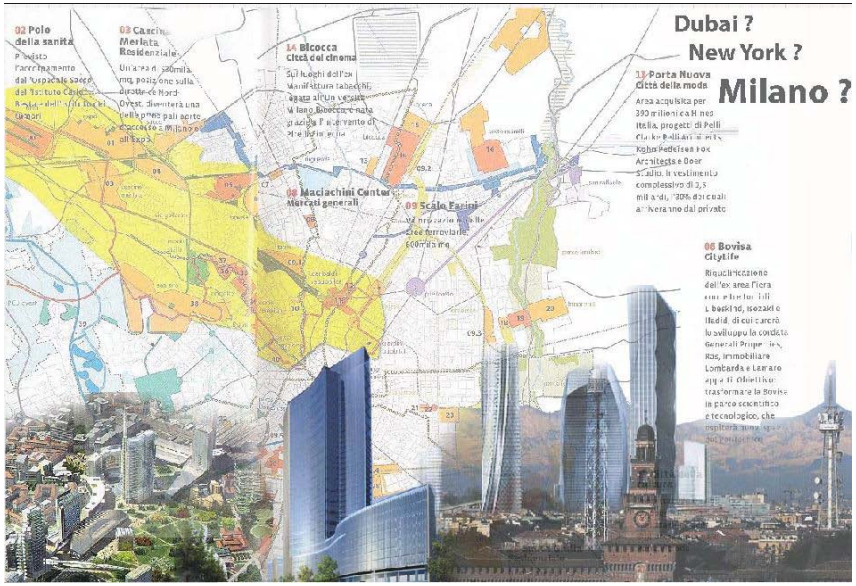


+ ARTIFICIAL COMPONENT: Settlement model



+ ARTIFICIAL COMPONENT:

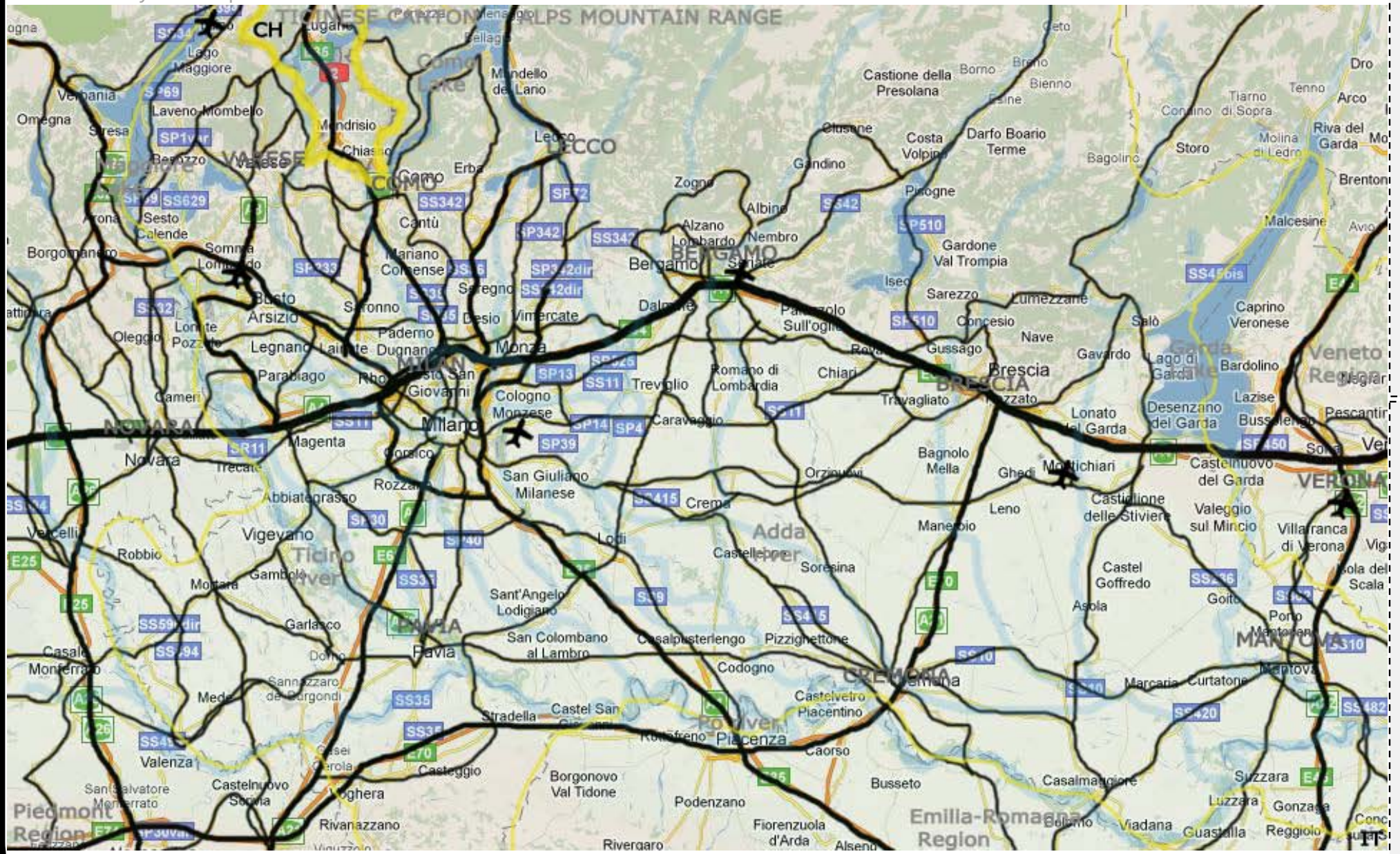
Landscape



+ Infrastructures

Layers/Subsystems

Roadways and Airports



NORTHERN ANDEAN CITY

LOMBARDIA - TICINO CITY

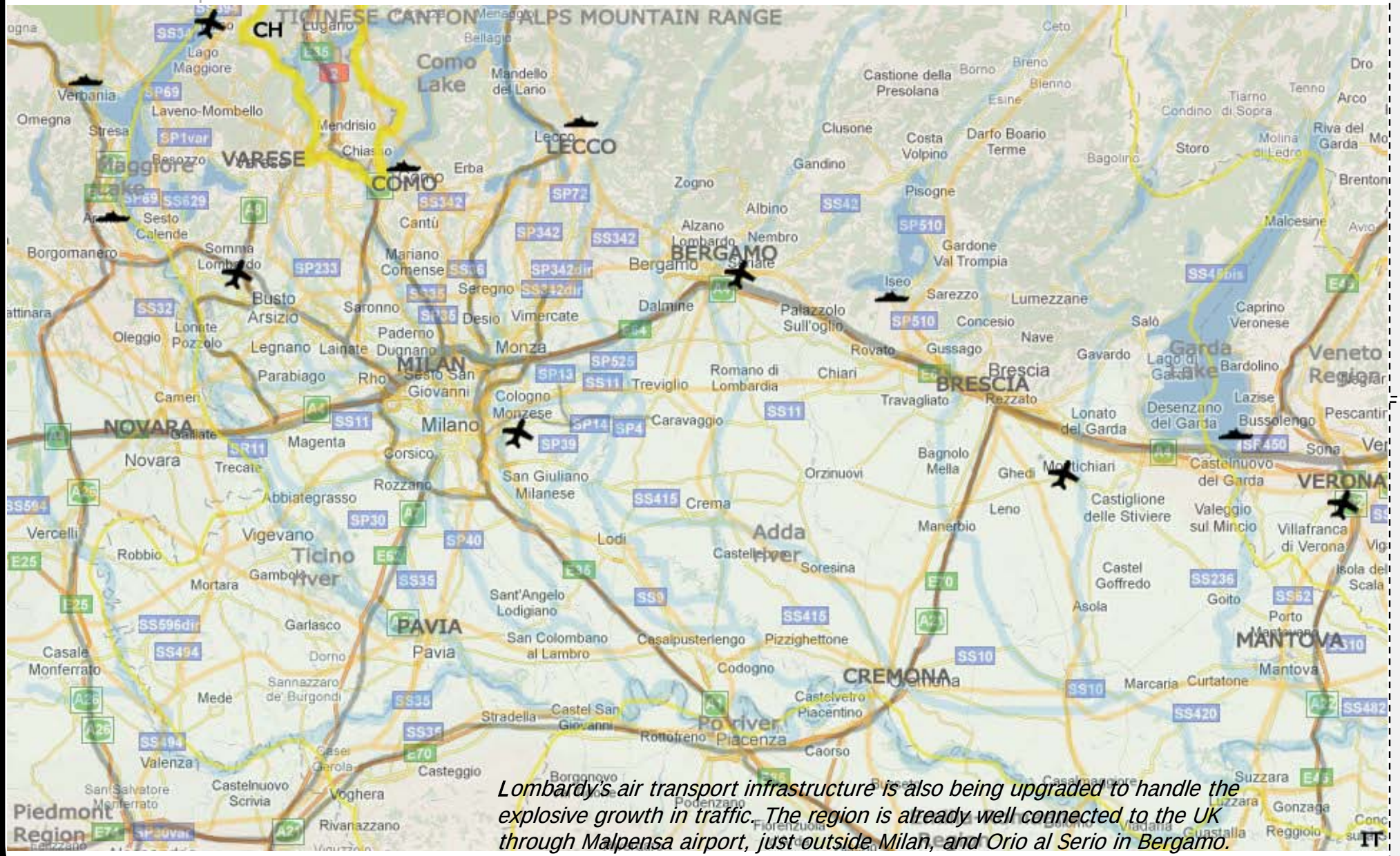
+ Infrastructures

Pedemontana Highway

Autostrada Pedemontana Lombarda

+ Infrastructures

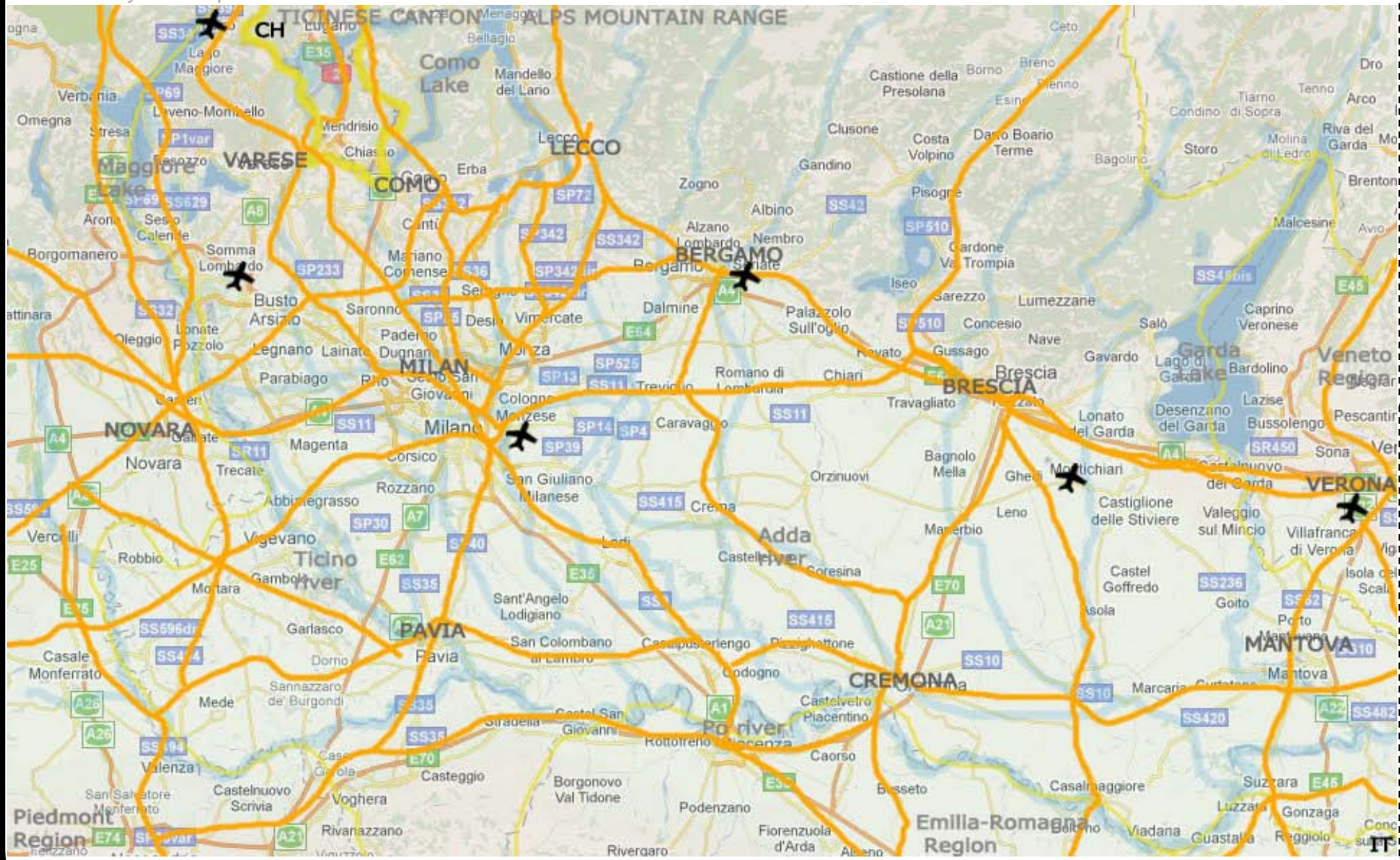
Layers/Subsystems
Air and Water ports



Lombardy's air transport infrastructure is also being upgraded to handle the explosive growth in traffic. The region is already well connected to the UK through Malpensa airport, just outside Milan, and Orio al Serio in Bergamo. Tourist numbers from the UK have literally taken off in Bergamo with Ryanair choosing it as a southern European hub.

+ Infrastructures

Layers/Subsystems
Railways and Airports

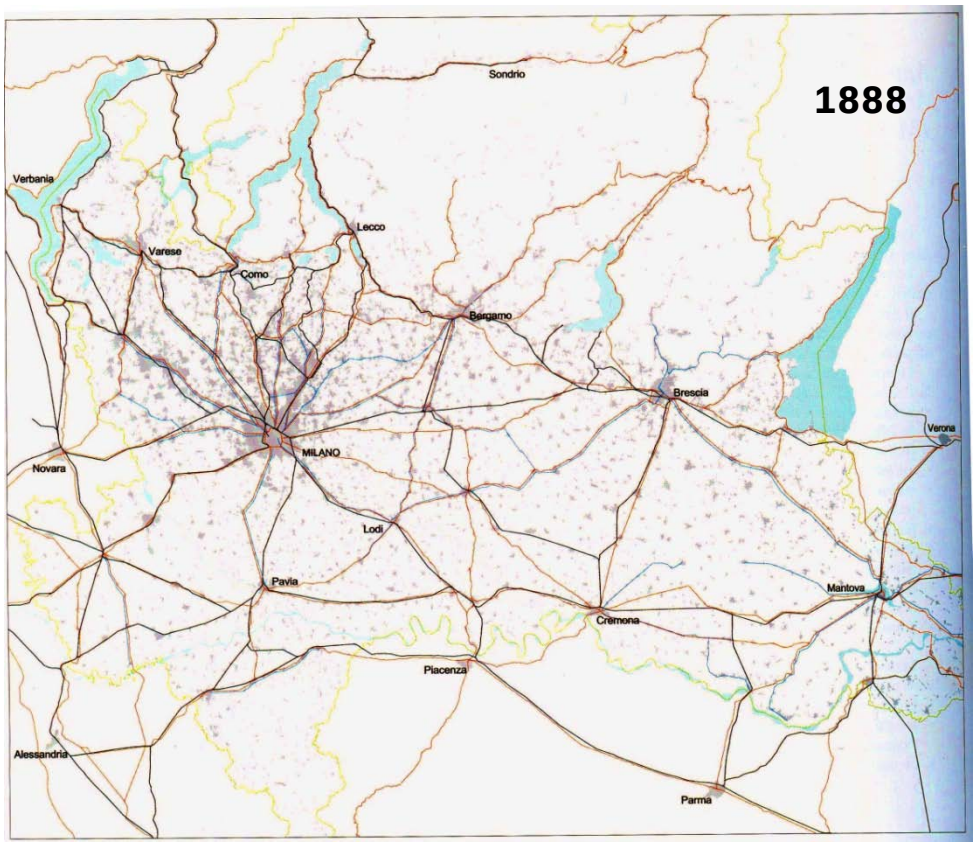


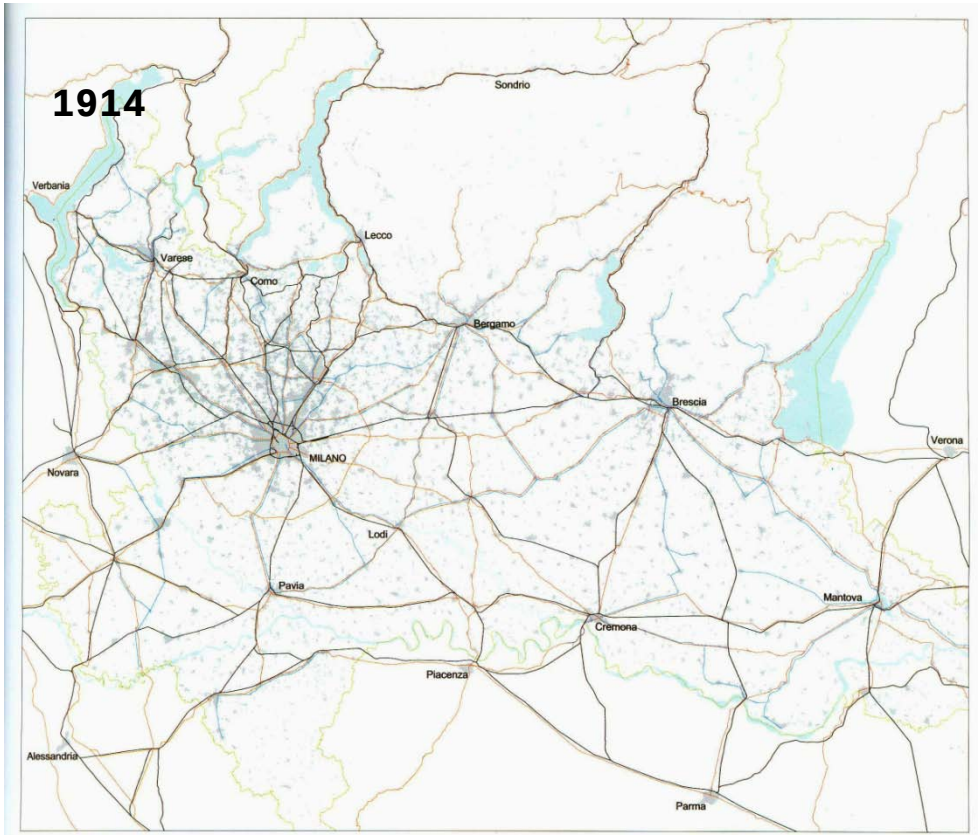
NORTHERN ANDEAN CITY

LOMBARDIA - TICINO CITY

+ Infrastructures

Layers/Subsystems



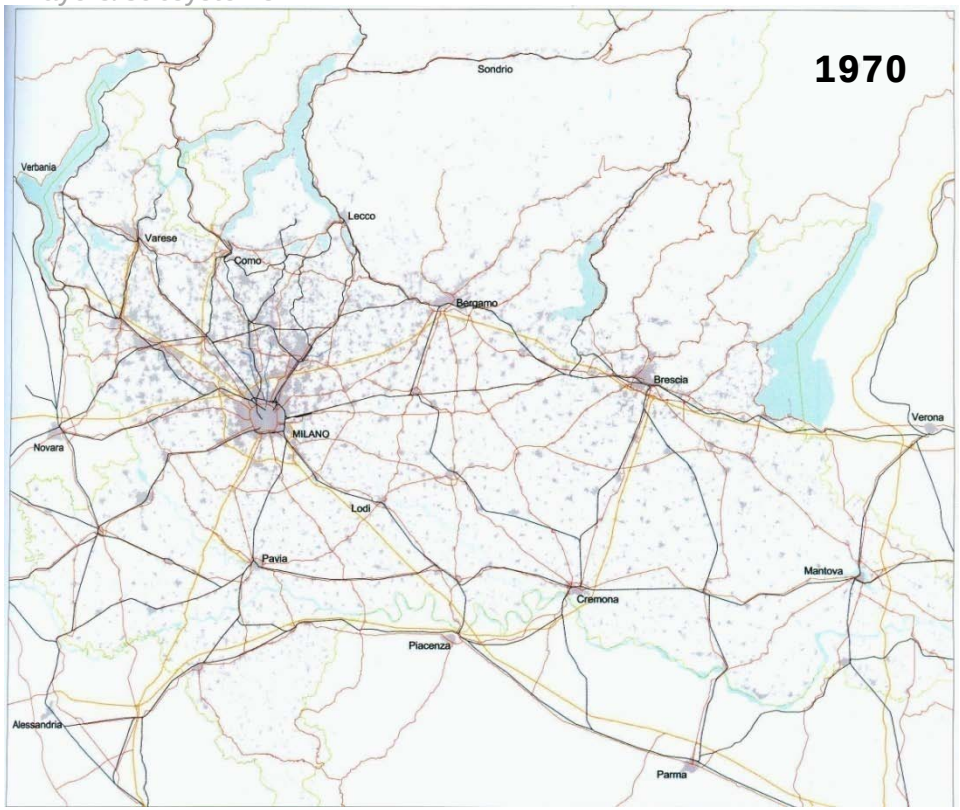


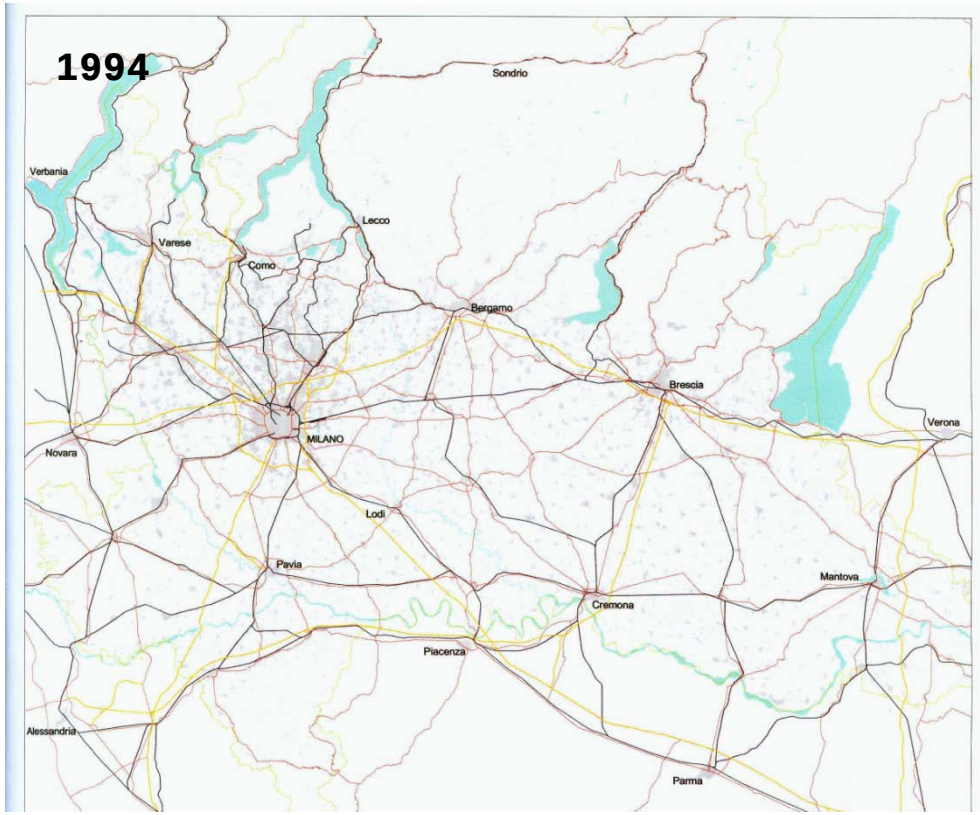
Settlement system (1994) and infrastructural net. 1888 - 1914

Urbanized areas
Rural areas
Highway
Main streets
Railway
Extra-urban tramway
Hydrography
Regional boundery

+ Infrastructures

Layers/Subsystems





Settlement system (1994) and infrastructural net. 1970 - 1994

The importance of infrastructures is clearly showed by these images::

the growth of a *strong network* and the expansion of *urbanized areas* are straightly correlated.

Since the XIX century (1888) the main *centres* of this urban region is clearly defined: first of all Milano, and then Novara, Varese, Como, Lecco, Bergamo, Brescia and Verona in the northern part, under the mountain (*Alps*) and close to the main hydrography (the lakes of Lombardy); Novara (in the other region ,named Piemonte), Pavia, Cremona and Modena in the southern part.
In these areas not only the urbanization growths, but also the main infrastructures as railway and main streets join up.
During the years these cities become a real *poli - centres* a sort of *node* of a strong net of infrastructures.
In 1994 the phenomenon of urbanization increases and it is concentrated around the same main cities, with new links of infrastructures.

The analysis of Milan :: an example of the structure and history of transportation in the Lombardia – Ticino polycentric metropolis

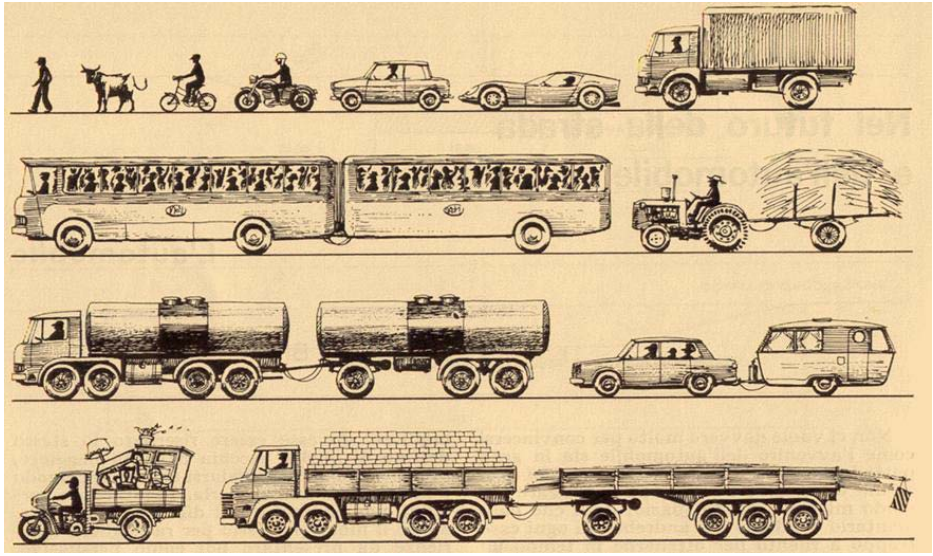
The crucial role that networks for transporting people play in the city, especially when the latter reaches metropolitan size, means that the subject is of special interest at the present time.
This work attempts the description and analysis of transport networks relating to one of the most important node in the northern urban system: *the metropolitan area and the metropolitan region of Milan* together.

Searching a transport system model...
The reading of histories about the development of transport system in this city enables us to clearly ascertain the *absence of a single and define model configured once and for ever*.

First of all in this way is possible to observe that the shift from horse-drawn coaches to railways and trams leads to a distance between residence and work, and thus to the growth in size of the big city. We clearly see that the development of the great modern city goes hand in hand (how could it be otherwise?) with new system of communal transport.

Subsequently, we witness the appearance of the private vehicle which, thanks to its efficiency and flexibility for resolving the call for transport in the city, temporarily corners a major part of the communal transport system. This confidence in the absolute validity of the private vehicle as a medium of civil mobility will configure the XX century city and it will not be until the and of that century that the failure of this system as a universal model will again situate communal transport at the hub of the configuration of the metropolitan city, just as it was at the beginning of it.

The transport system of a city is, therefore, the outcome of different **policies** applied at different historical moments in order to resolve the pressing problems that were posed in those moments.



+ Infrastructures

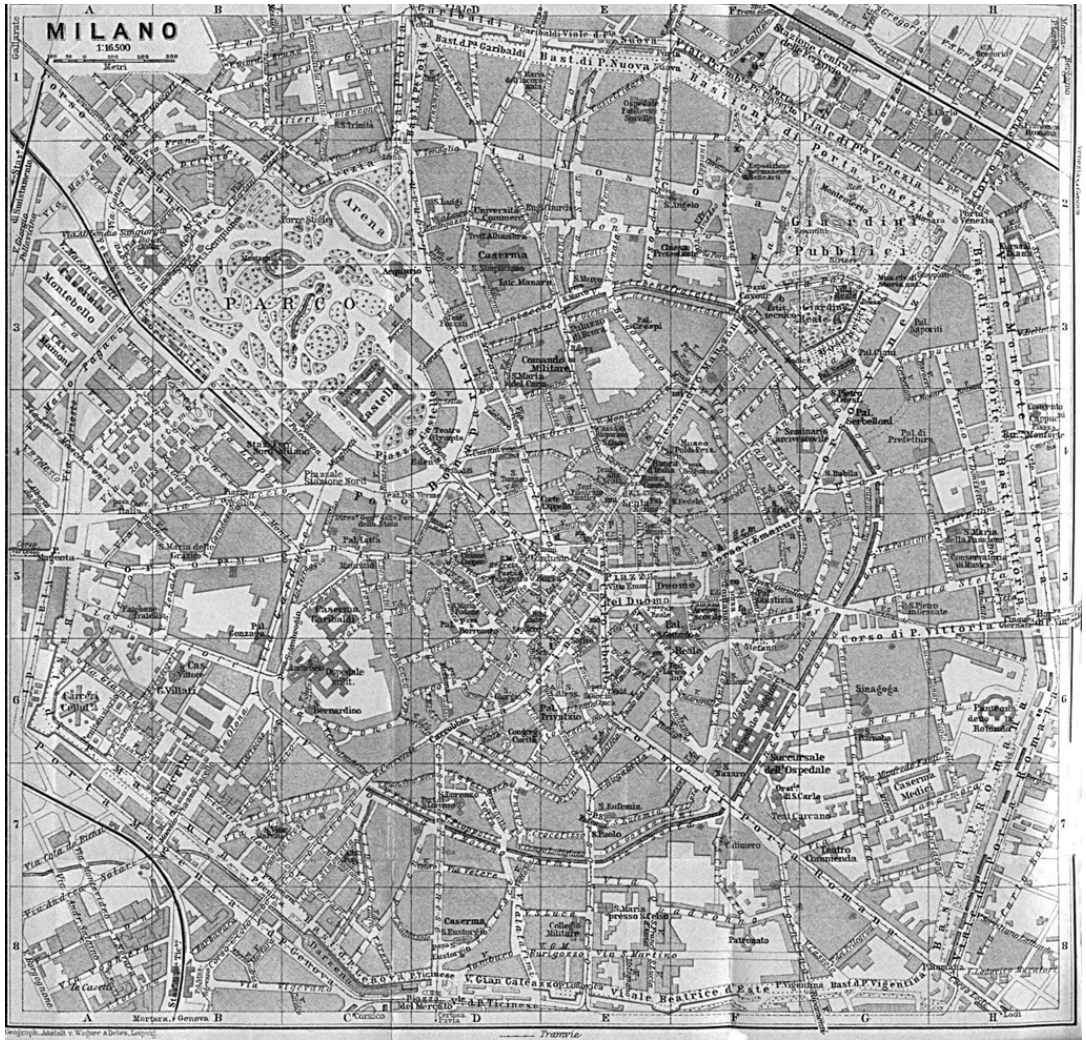
Transportation in Milano center

+ Urban Region:: the node of the net :: MILAN

In the mid - IX century Lombardy, still part of the Austro – Hungarian Empire, was a rich agricultural area with an incipient industrial base growing out of the manufacture of silk and cotton in the XVIII century. With its 240000 inhabitants Milan was the capital of a region that possessed, furthermore, a balanced hierarchy of intermediate cities. Incorporated into *Kingdom of Italy* in 1859, Milan became its economic and industrial capital and focal point of immigration, reaching the half – million mark of inhabitants by the end of the XIX century. Milan's municipal boundary was extended in 1907, 1918 and 1923 through the annexation of neighbouring townships.

Industry and worker housing evolved to the *north*, whilst the *south* retained its agricultural quality and smaller growth in population, and by the 1920's, albeit without tangible results. On the other hand, some of Europe's first motorways were built.

Huge economic growth after the Second World War produced a change of scale in the genuine city that was barely reflected in the construction of the new railway infrastructures, although the 1960's. The building of a modern suburban rail network had to wait until the beginning of the XXI century.



+ Infrastructures

Transportation in Milano center

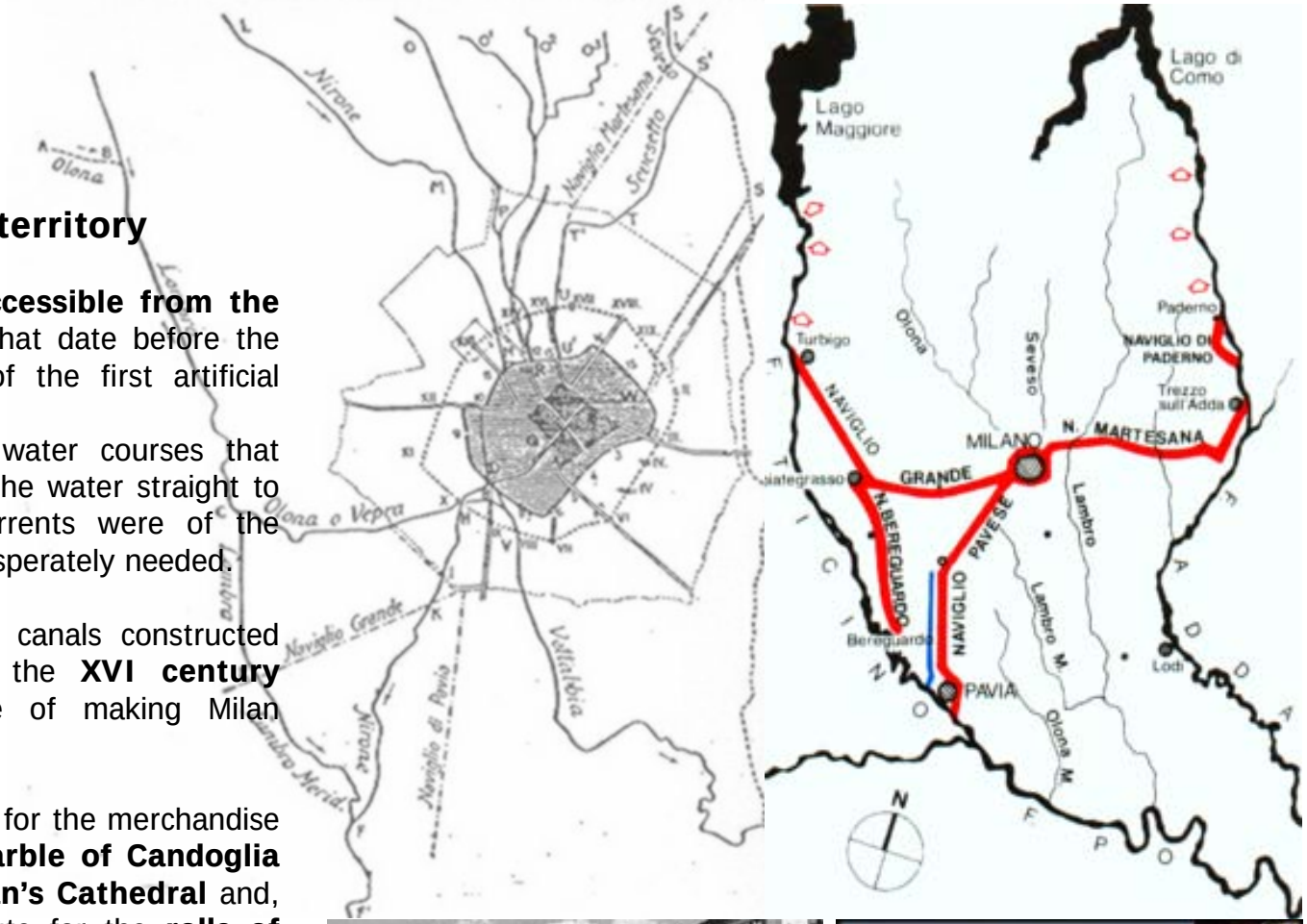
Waterlines as structures of the territory

The trails of the idea to make **Milan accessible from the see** are lost in the chronicles of times that date before the times of the design and construction of the first artificial **navigable canal**.
Since the antique times many of the water courses that encircled the city had deviations to take the water straight to the city but none of the rivers or torrents were of the sufficiently big to become what the city desperately needed.

The **Navigli of Milan** are the artificial canals constructed between **1179** (*Naviglio Grande*) and the **XVI century** (*Naviglio Martesana*) with the purpose of making Milan accessible from Ticino and Adda.

The Navigli were a passing route not only for the merchandise on its' way to Milan but also for the **marble of Candoglia used for the construction of the Milan's Cathedral** and, in more recent times, a transporting route for the **rolls of paper used by the typewriters of Corriere della Sera**.

The construction of the Naviglio Grande begun in **1179** and in **1209** the Naviglio arrived to Milan. Since the first day of the construction the best engineers undertook the project and even today it is possible to admire the innovative system of dams conceived by **Leonardo da Vinci** at the end of XV Century.



The navigli: once upon a time and today.
On the upper:
Waterway around of Milan – Roman Empire; The Navigli – XX century

+ Infrastructures

Transportation in Milano center

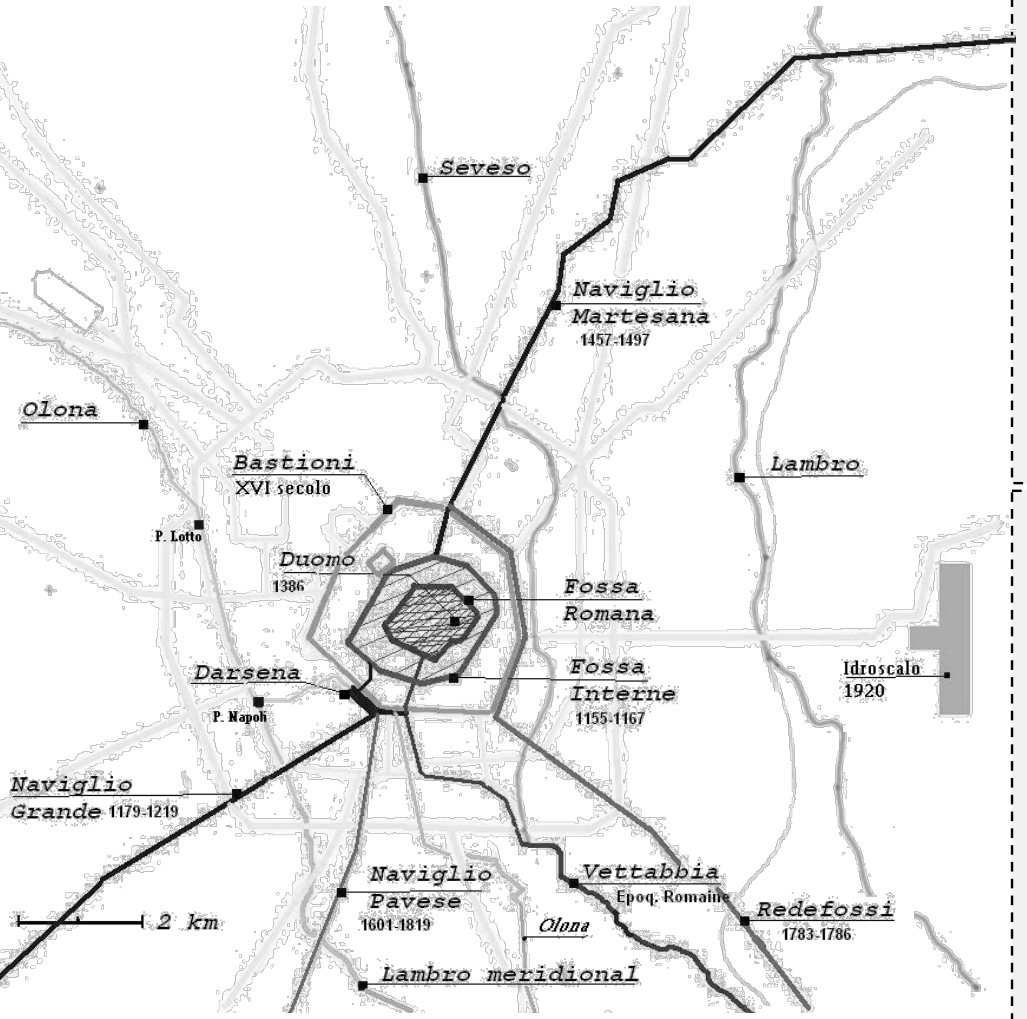
It took only 35 years, from 1439 to 1475, to build **90 kilometres of canals on the Milan territory** made navigable thanks to the existence of 25 valleys, a characteristic no other city has. The development of the system didn't stop at this point. On the contrary, when **Leonardo da Vinci** begun working on the project in 1482, the Martesana was improved and he also started setting up a new system of canals that would make navigation from Valtellina to Milan possible.

It was 1482 when **Leonardo da Vinci**, as soon as he arrived in Milan, was assigned by Ludwig II il Moro with the task to study a system that would make the navigation from Lake Como to Milan possible. Leonardo, who already designed the system of the dams in order to solve the problem of height difference of the territory making the navigation possible didn't miss the chance to draw some sketches that are preserved today in the Museum of Navigli.

Since then the Navigli were characterized by a continuous development particulary by the construction of new canals and dams. This is how the **Navigli became a fundamental means of communication for the city of Milan**.

In the second half of the Nineteenth Century the system of transportation by river fell into a decay because of the slowness of traveling (3 km/h) and the competitions by railways and tramcars that begun supplanting the river navigation inside and outside the city. Therefore the covering of some parts of the canals inside the city was planned but undertaken as late as 1929.

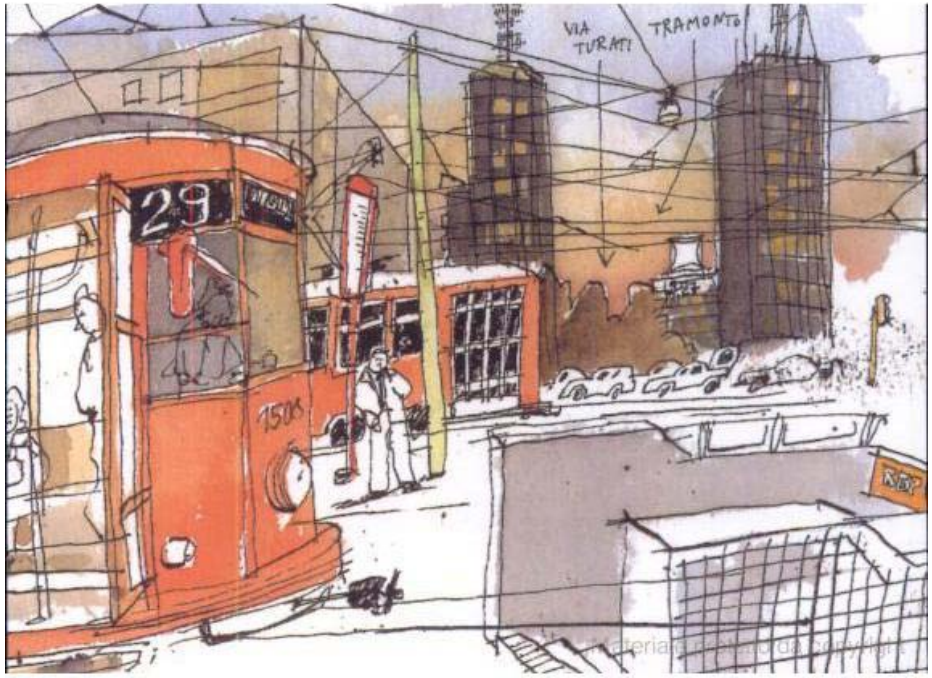
Nowadays the term Navigli, in Milan, is identified with the two opened parts of **Naviglio Grande** and **Naviglio Pavese** and in more general sense the area in between the two canals characterized by the many nightclubs.



Trams

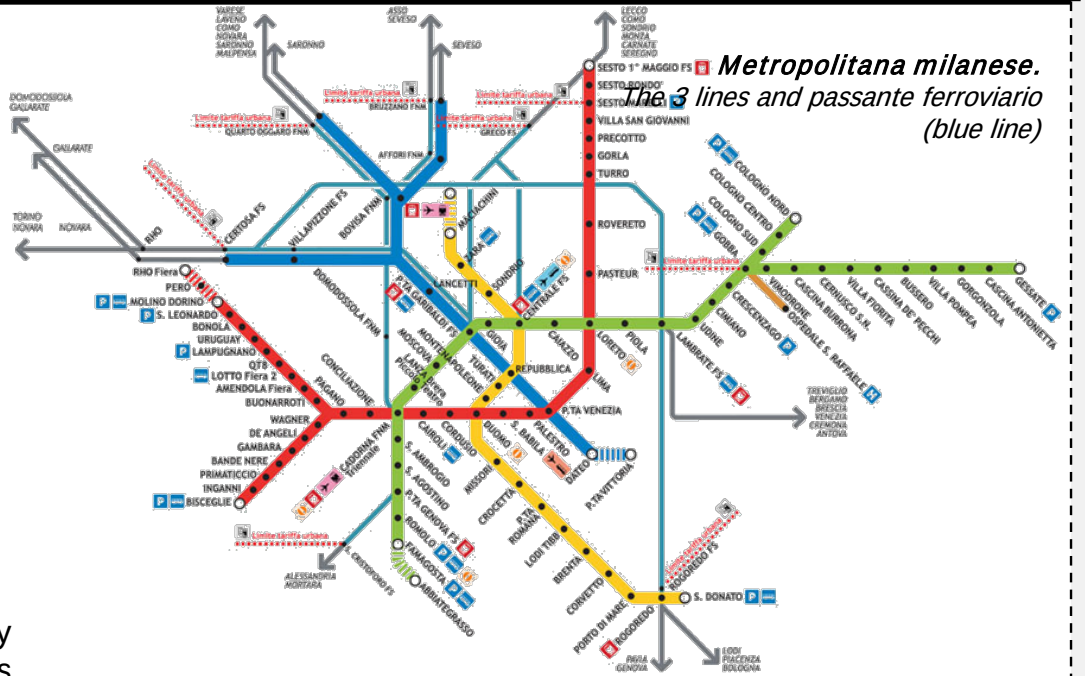
In **1835** omnibuses appeared and in **1841** a line linked the recently opened station of Porta Nuova to the centre of the city. In 1861 the *Società Anonima degli Omnibus per la Città di Milano (SAO)* was created. This company put the first horse – drawn tram into service in **1876**, the Ippovia Milano – Monza, initially without entering the city (Porta Venezia).
At almost the same time, in **1878**, the Milano – Vaprio steam tram appeared and soon after the Milano – Corate, developed with English capital. Trams extended widely throughout lombardy, with thirteen steam and three electric lines *(Società Trazione Elettrica Lomabrdia)* . This **Milan – centred network**, with its frequent stops, made up a passengers service the railways showed little interest in.

The moment the new technology of electrical traction appeared the city decided to promote its implantation in the urban transport network and starting in **1897**, and via the private company Società Generale Edison Elettricità, the 44 Km of SAO horse-drawn tramways were gradually electtrified and transferred to the Ufficio Tranviario Municipale, with the Edison Company retaining the operation of the service until **1917**, when its contract endend. The city then assumed direct operational control of its 570 motorised and 300 non-motorised coaches and created the *Azienda Tramviaria Municipale (ATM)*. In 1919, another public company, *Società Trazione Elettrica Lombarda (STEL)*, took charge of the regulation and electrification of the interurban tram network.
In **1938** the ATM took over the part of the STEL network in and around Milan. In all Lombardy there were 1700 km of tramway and 1600 km of railway.



The first **petrol – driven bus** appeared in 1905 but the evolution of its means of transport only became important after 1925, when Fiat created the Compagnia Autobus Milano. Some tram services are now replaced by buses.
In 1933 the trolley bus (**filovia**) appeared, in an attempt to combine the flexibility of the bus with the economy and robstness of elecric traction, but it had an ephmeral existence, disappearing in 1959. Today the ATM still have some typologies of these transport, but just a small number.

The crisis among small interurban railway companies forced the municipality of Milan to become increasingly involved in theoir management and by **1933** the 200 km of private elecrtical and steam tram lines were run by the ATM . Between **1949** and **1957** these 3interurban lines were dismantled and replaced by bus service. On the other hand many of th urban lines have been preserved, such that Milan is one of the major European cities with an extensive tram network that is currently undergoing renovation.



Metropolitana milanese.
The 3 lines and passante ferroviario (blue line)

Motorways

Italy followed in the footsteps of Germany in the early construction of motorways. Built using private capital, and thus toll-charging, were the **Milan - Lake Maggiore** motorway (1925), the **Milano-Bergamo** (1927) and **Milan-Turin** (1932). Following the Second World War the *Amministrazione Nazionale Autonoma per le strade (ANAS)* was created. A public body which regulated existing concessions and also promotode and financed new ones. With its pressure and that of the Istituto per la Ricostruzione Industriale (IRI) the motorway network throughout Italy, and particularly in the environs of Mialn, was developed from the end of the 1960s onwards under the aegis of public companies, consisting for the most part of regional bodies. And financed by charging of tolls and by state funding.

The Metropolitana

In 1925 the first serious project for constructing a metro network appeared, and debate begins between the partisans of a purely urban and municipal network, Paris-style, or of an interurban one as in London, but the project went no further.
Most European cities of a comparable size to Milan forged way ahead of it in the building of a metro.

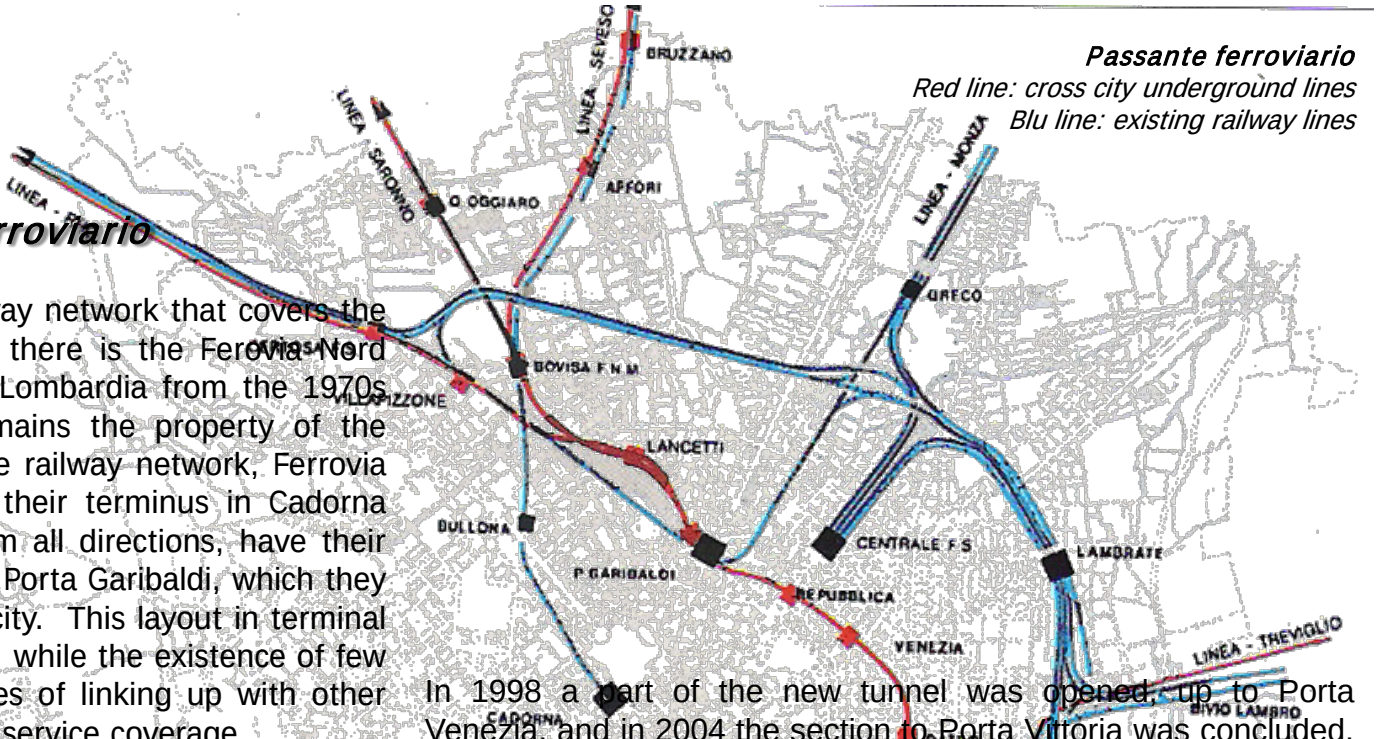
Finally , a private company was formed at ATM headquarters in **1955** called **Metropolitana Milanese spa** (MM), 50% of whose shares were underwritten by the municipality, with objective of constructing a metro network with four lines. In 1964 the first section of **Line 1** was opened between Lotto, Duomo and Marelli; and in 1969 **Line 2** between Caiazzo and Gobba. **Line 3** had wait until 1990. Yet despite the bringing into service of the metro, during the 1960s the public transport system lost passengers to the pressure of the motor car, while the bus and trolley bus lines suffered the congestion on the road system, with the result that their running costs increased. Faced with this situation the municipality had to meet considerable operational deficits.

During the **1960s** the ATM also worked on the modernization of the interurban “Dell’Adda” line (from Milan to Vimercate and Bergamo) and on the newline “della Brianza”, going north.
These initiatives had little continuity and the more urban section of these lines went on the form part of metro Line 2 and of through ail service. Likewise with a time lag in terms of other European metropolises, in **1970** the Italian state got involved for the first time in the financing of the Metropolitana.

The *collegamento passante ferroviario*

Milan is the centre of an extensive railway network that covers the whole of Lombardy. On the one hand there is the Ferrovia Nord Milano, a companyrun by the Regione Lombardia from the 1970s onwards, but whose infrastructure remains the property of the state, and on the other the Italian state railway network, Ferrovia dello Stato (FS). The FNM lines have their terminus in Cadorna Station, while those of FS, arriving from all directions, have their main terminuses in Milano-Centrale and Porta Garibaldi, which they reach via ring which circles part of the city. This layout in terminal station limits the capacity of the system, while the existence of few stations in the city limits the possibilities of linking up with other means of transport and with the area of service coverage.

At the beginning of the 1970s the City of Milan and Regione Lombardia proposed to FS the building of a connection between Porta Gariblaldi and Porta Romana, but FS was not ina position to get economically involved in the project and it was Line 3 of the metro which covered this corridor. This idea was not wasted, however, and in 1981 the governments of the city, the region and the state got jointly involved in a plen to have the suburban rail service of FS and FNM cross the city. A tunnel built between Bovisa, Garibaldi and Porta Vittoria, which was to be for joint use by both companies and which provided for the two-by-two link-up in the city centre of the different lines arriving from all directions. Optimum operation was arrived at by interlinking lines or similar demand. In this way the equivalent of a metro network at regional scale was obtained, with a common trunk and six branch lines at each end. As well as the new tunnel, important improvements were made to the external lines, in particular the quadrupling of track, which enabled long-distance services to be separate from suburban ones.

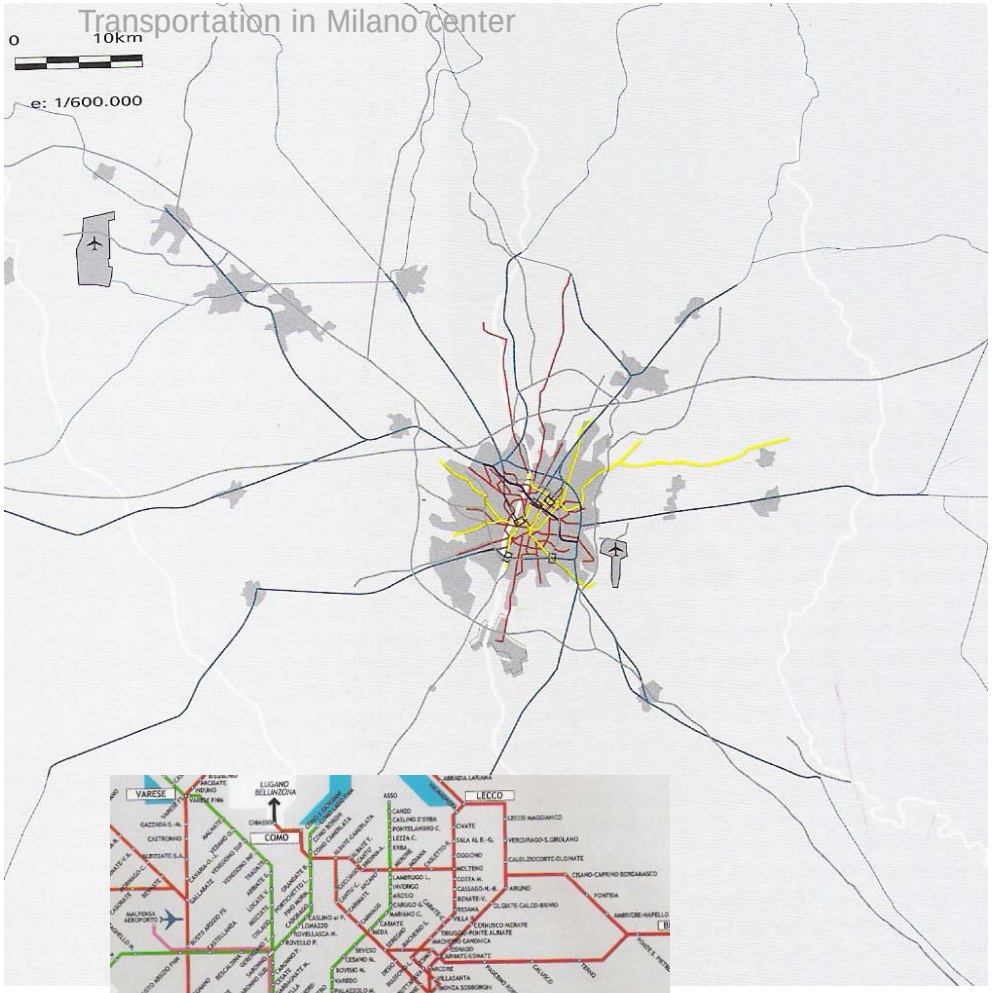


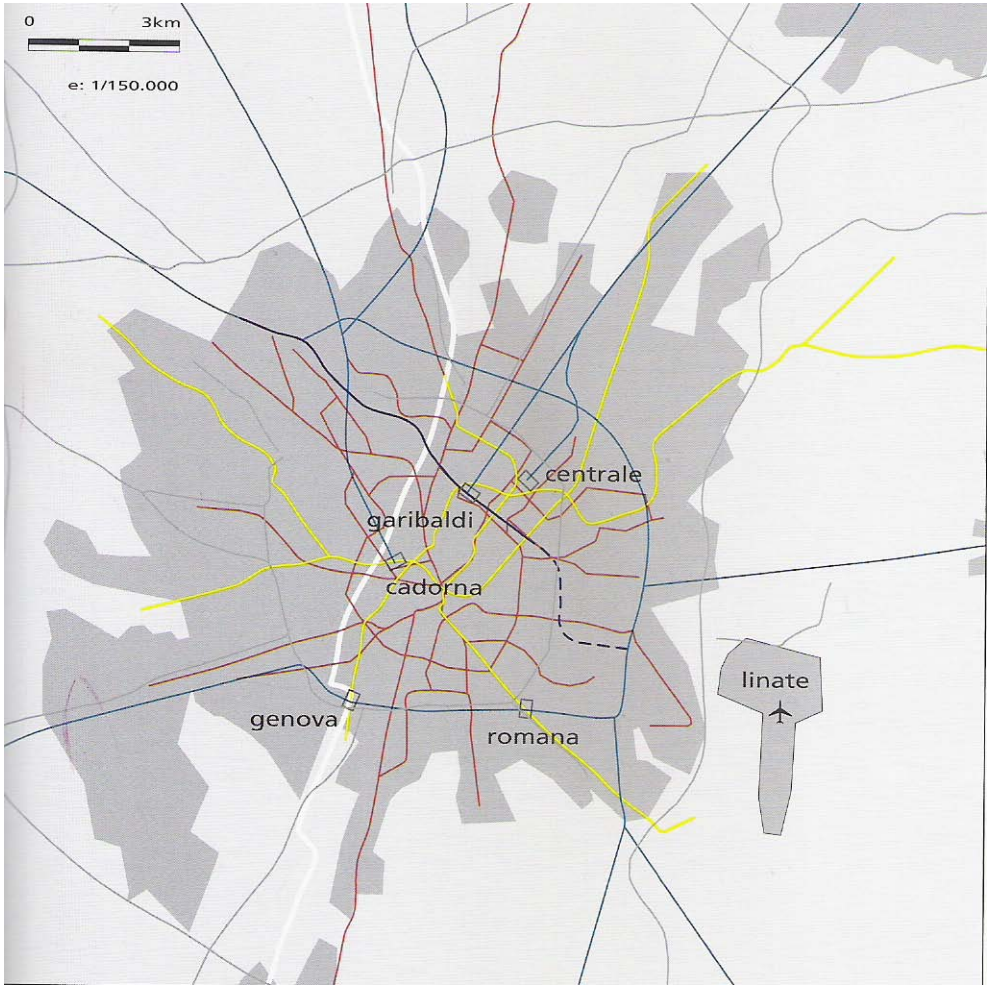
Passante ferroviario
Red line: cross city underground lines
Blu line: existing railway lines

In 1998 a part of the new tunnel was opened up to Porta Venezia, and in 2004 the section to Porta Vittoria was concluded, thus completing the connection which enabled through services to be set up. In 2001 the state transferred to the Regione Lombardia the programming of regional services throughout the entire Lombardy rail network, along with the funds earmarked for subsidising the running of FNM and of the regional services of FS. The Regione Lombardia created the Servizio Ferroviario Regionale (SFR)with the lines of FS-Trenitalia and FNM. The services specific to the metropolitan area of Milan, with high arrival and departure frequencies, will go by the name of *compresoriale*, while services covering longer distance will be called regionale. This network will go on expandingin the next few years, especially when the bringing into service of the complete throut service will coincide with the liberalisation of the railways, so that Regione Lombardia will have to put out the provision of rail services to tender, to which companies other than the present one will theoretically be able to present themeselves. This will facilitate change by esatbilishing cadenced schedules (with constant intervals between journays) and redistributing yhe use of yhe infrastructure among the companies.

Transportation in Milano center

Suburban Trains.
System of infrastructure passing in Milan city





Legend

- Metropolitana
- Tramways
- Rail network with terminal stations
- Passante ferroviario
- Motorways and main roads
- Built-up area
- Terminal stations

3. AXIOM 3: TERRITORIES

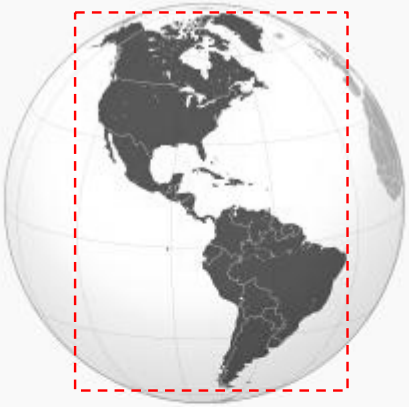
+ Sample territories:

+ The Northern Andean City

+ Location
+ Some territorial facts
+ Bio Physical Component
  + Geography
  + Natural Regions
+ Dynamic Component
  + Traces of a common past
  + Pre-Hispanic America
  + Hispanic America: colonial settlement
  + Post independence urbanity: la Gran Colombia.
  + Late industrialization: 1850 – 1950. Railways, industrial cities and urbanization processes
  + Society
+ Artificial Component
  + Morphology
  + Settlement model
  + Landscape
  + Infrastructures
    + Layers/subsystems
    + Panamerican Highway
    + Railway Panorama and New Devices
      * Special feature: Efforts for a sustainable transportation in Colombia

+ Location:
South America

Americas



Area	42,549,000 km^2
Population	910,720,588 (July 2008 est.)
Pop. density	21/km^2 (55/sq mi)
Demonym	American
Countries	35
Dependencies	23 *List of countries and territories in the Americas*
Languages	Spanish, English, Portuguese, French, and many others
Time Zones	UTC-10 to UTC

South America

Area	17,840,000 km^2 (6,890,000 sq mi)
Population	385,742,554 (2008, 5th)
Pop. density	21.4 per km^2 (56.0 per sq mi)
Demonym	South American, American[1]
Countries	12 (List of countries)
Dependencies	3
Languages	List of languages
Time Zones	UTC-2 to UTC-5
Largest cities	**List** [show]

Regional organization:
Union of South American Nations

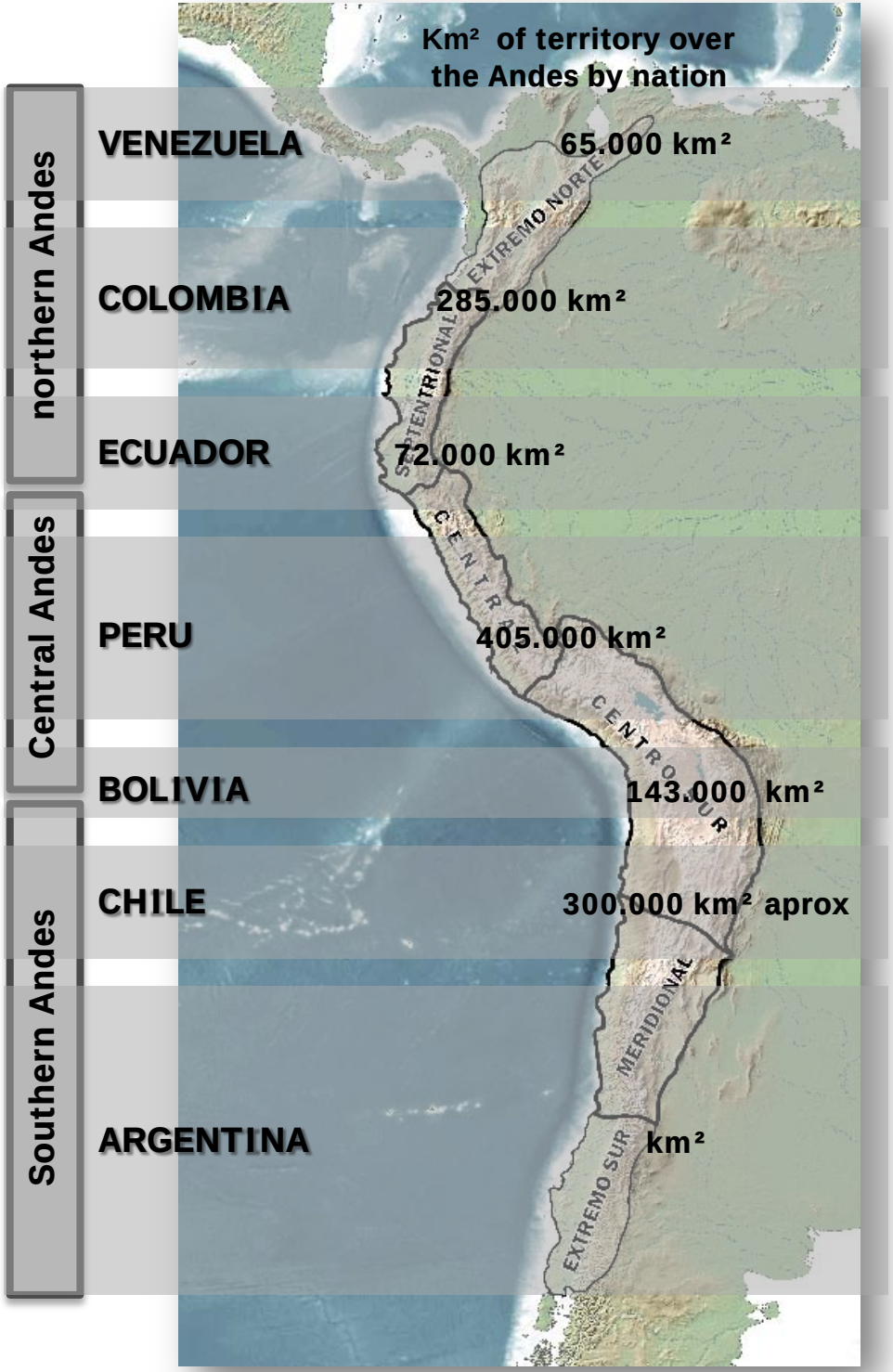
- Members of the Andean Community of Nations (CAN):
  - Bolivia
  - Colombia
  - Ecuador
  - Peru
- Members of Mercosur:
  - Argentina
  - Brazil
  - Paraguay
  - Uruguay
  - Venezuela
- Other members
  - Chile
  - Guyana
  - Suriname

*"… Recently, an intergovernmental entity has been formed which aims to merge the two existing customs unions: **Mercosur** and the **Andean Community**, thus forming the third-largest trade bloc in the world. This new political organization known as **South American Community of Nations SACN** seeks to establish free movement of people, economic development, a common defense policy and the elimination of tariffs."*

+ Location: The Andes

The **Andes** are the world's longest continental mountain range. It is a continual range of highlands along the western coast of South America. This range is about 7,000 km (4,300 mi) long, about 200 km (120 mi) to 700 km (430 mi) wide (widest between 18 degrees South and 20 degrees South latitude), and of an average height of about 4,000 m (13,000 ft).
The highest peak, **Mt. Aconcagua**, rises to an elevation of about 6,962 m (22,841 ft) above sea level. The **Mt. Chimborazo** in the Ecuadorean Andes is located the point on the surface of the Earth that is the most distant one from its center. This is because of the Earth's equatorial bulge that results from its rapid rotation. The world's highest volcanoes are in the Andes, including **Ojos del Salado** on the Chile-Argentina frontier which rises to 6,893 m (22,615 ft), and over 50 other volcanoes that rise above 6,000 m.

In the northern part of the Andes, the isolated **Sierra Nevada de Santa Marta** range is often considered to be part of the Andes, and the islands of the Dutch Caribbean (Aruba, Bonaire, and Curaçao) which lie in the Caribbean Sea off the coast of Venezuela, represent the **submerged peaks** of the extreme northern edge of the Andes range.
The Andes extend to seven countries, in alphabetical order: Argentina, Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela, some of which are known as the **Andean States**:



+ Location: The Andes

Ecuator line

1 Actual Andean network of major cities.

2 Pre hispanic urban South America

3 Main Andean geographies

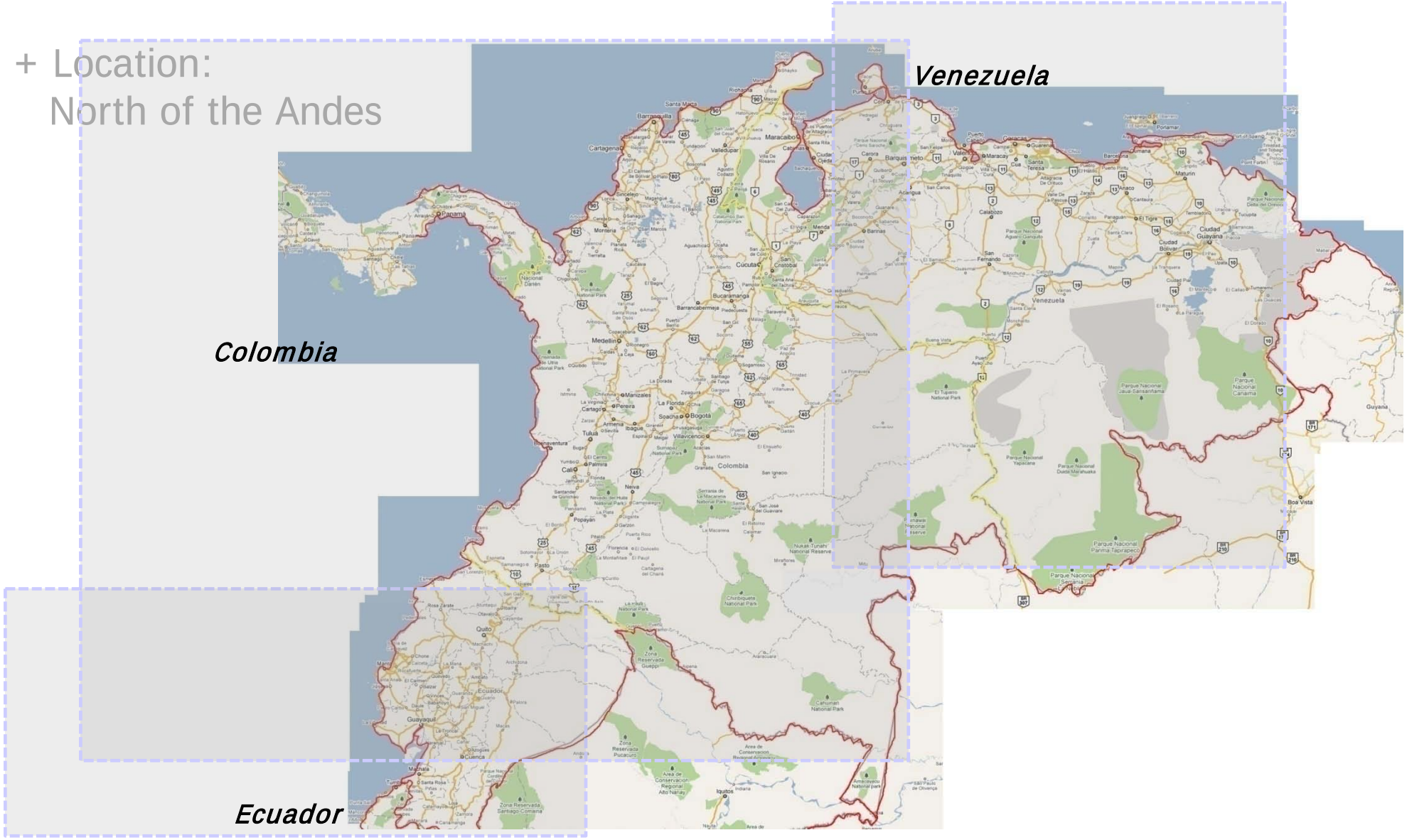
Northern Andes Ecoregional Complex

The Northern Andes Ecoregional Complex (NAEC), is a part of WWF's new way of looking at the world. At the heart of this new approach are the ecoregions - both land and water areas that harbor a unique set of species, climatic conditions, and geographic features.

The NAEC is home to 14 such ecoregions, including 7 **montane forests**, 4 **páramo grasslands**, and 3 **dry forests**. While each of these ecoregions is distinct, the ecological processes at work in each are so closely connected that all of them are considered a part of the complex. Located in the highlands of tropical Andes, this complex extends from 11° North latitude in northern Colombia, 2,000 km southward to northern Perú, at approximately 6° South latitude. The recognized northeastern limits of the NAEC are Sierra de Perijá (Colombia, Venezuela) and Merida Cordillera (Venezuela).

The northwestern limit is Sierra Nevada de Santa Marta (Colombia). The southern limit is Abra de Porculla mountain pass in Huancabamba depression (Peru) that serves as a biogeographic barrier to species movement, separating the northern and southern Andes.

+ Location:
North of the Andes



*... A rough and eroded high mass of mountains called the Loja Knot, in southern Ecuador, marks the transition between the Peruvian cordilleras and the Ecuadorian Andes. The **North Andes Plate** is a small tectonic plate located in the northern Andes. It is squeezed between the faster moving South American Plate and the Nazca Plate. Due to the subduction of the Nazca Plate this area is very prone to volcanic and seismic activity...*

Geography Dictionary, Northern Andes

+ Republic of Ecuador.

Area:
total: 283,561 sq km - includes Galapagos Islands
country comparison to the world: 73
land: 276,841 sq km
water: 6,720 sq km
Climate:
tropical along coast, becoming cooler inland at higher elevations; tropical in Amazonian jungle lowlands
Natural resources:
petroleum, fish, timber, hydropower
Natural hazards:
frequent earthquakes; landslides; volcanic activity; floods; periodic droughts
Environment - current issues:
deforestation; soil erosion; desertification; water pollution; pollution from oil production wastes in ecologically sensitive areas of the Amazon Basin and Galapagos Islands
Population:
14,573,101 (July 2010 est.)
country comparison to the world: 65
Population growth rate:
1.497% (2010 est.)
country comparison to the world: 87
Urbanization:
urban population: 66% of total population (2008)
rate of urbanization: 2.1% annual rate of change (2005-10 est.)
Administrative divisions:
24 provinces Azuay, Bolivar, Canar, Carchi, Chimborazo, Cotopaxi, El Oro, Esmeraldas, Galapagos, Guayas, Imbabura, Loja, Los Rios, Manabi, Morona-Santiago, Napo, Orellana, Pastaza, Pichincha, Santa Elena, Santo Domingo de los Tsachilas, Sucumbios, Tungurahua, Zamora-Chinchipe

Ethnic groups:
mestizo (mixed Amerindian and white) 65%
Amerindian 25%, Spanish and others 7%, black 3%
Religions:
Roman Catholic 95%, other 5%
Languages:
Spanish (official), Quechua and others
Literacy:
total population: 91%
Education expenditures:
1% of GDP (2001) country comparison to the world: 179

+ Republic of Ecuador. Economic data

Ecuador is substantially dependent on its petroleum resources, which have accounted for more than half of the country's export earnings and one-fourth of public sector revenues in recent years. In 1999/2000, Ecuador suffered a severe economic crisis, with GDP contracting by more than 6%. Poverty increased significantly, the banking system collapsed, and Ecuador defaulted on its external debt later that year. In March 2000, Congress approved a series of structural reforms that also provided for the adoption of the US dollar as legal tender. Dollarization stabilized the economy, and positive growth returned in the years that followed, helped by high oil prices, remittances, and increased non-traditional exports. From 2002-06 the economy grew 5.5%, the highest five-year average in 25 years. The poverty rate declined during this period but remained high at 38% in 2006. After moderate growth in 2007, the economy reached a growth rate of 6.5% in 2008, in large part due to high global petroleum prices. Poverty levels declined to about 35% by the end of 2008. President Rafael CORREA, who took office in January 2007, raised the specter of a sovereign debt default and followed through on those threats in December 2008, defaulting on $3.2 billion in international bonds, representing over 80% of Ecuador's private external debt. Economic policies under the CORREA administration - including an announcement in late 2009 terminating 13 bilateral investment treaties, one with the US - have generated economic uncertainty and discouraged both domestic and foreign private investment. The Ecuadorian economy contracted in 2009, mainly due to the global financial crisis, and also the sharp decline in world oil prices and remittance flows.

GDP (purchasing power parity):
$108.8 billion (2009 est.)
country comparison to the world: 65 $109.7 billion (2008 est.)
$103 billion (2007 est.)
note: data are in 2009 US dollars
GDP - composition by sector:
agriculture: 6.8%
industry: 35.2%
services: 58% (2009 est.)
Unemployment rate:
8.5% (2009 est.)
country comparison to the world: 99 7.3% (2008 est.)
Population below poverty line:
35.1% (2008)
Distribution of family income - Gini index:
47.9 (2009)
country comparison to the world: 31 50.5 (2006)
note: data are for urban households
Investment (gross fixed):
22.2% of GDP (2009 est.)
country comparison to the world: 68
Agriculture - products:
bananas, coffee, cocoa, rice, potatoes, manioc (tapioca), plantains, sugarcane; cattle, sheep, pigs, beef, pork, dairy products; balsa wood; fish, shrimp
Industries:
petroleum, food processing, textiles, wood products, chemicals
Exports - commodities:
petroleum, bananas, cut flowers, shrimp, cacao, coffee, hemp, wood, fish
Exports - partners:
US 34.41%, Peru 10.05%, Chile 7.15%, Panama 5.3%, Colombia 4.58%, Russia 4.11% (2009)
Imports - commodities:
industrial materials, fuels and lubricants, nondurable consumer goods
Imports - partners:
US 26.93%, Venezuela 10.15%, Colombia 9.42%, China 8.02%, Brazil 4.35% (2009)

+ Republic of Ecuador. Infrastructure data

National branding image of Ecuador

Airports:
428 (2010)
country comparison to the world: 18
Airports - with paved runways:
total: 105
over 3,047m: 3
2,438 to 3,047m: 5
1,524 to 2,437m: 17
Airports - with unpaved runways:
total: 323
914 to 1,523 m: 39
Heliports:
2 (2010)
Pipelines:
extra heavy crude 435 km; gas 5 km; oil 1,374 km;
refined products 1,301 km (2009)
Railways:
total: 965 km
country comparison to the world: 91
narrow gauge: 965 km 1.067-m gauge (2008)
Roadways:
total: 43,670 km
country comparison to the world: 86
paved: 6,472 km
unpaved: 37,198 km (2006)
Waterways:
1,500 km (most inaccessible) (2008)
country comparison to the world: 54
Merchant marine:
total: 37
country comparison to the world: 80
foreign-owned: 1 (US 1)
Registered in other countries: 5 (China 1, Panama 4) (2008)
Ports and terminals:
Esmeraldas, Guayaquil, Manta, Puerto Bolivar

+ Republic of Colombia

Ethnic groups:
mestizo 58%, white 20%, mulatto 14%, black 4%, mixed black-Amerindian 3%, Amerindian 1%
Religions:
Roman Catholic 90%, other 10%
Languages:
Spanish
Literacy:
total population: 90.4%
School life expectancy (primary to tertiary education):
total: 12 years
Education expenditures:
4.7% of GDP (2006)

Area:
total: 1,138,914 sq km
country comparison to the world: 26
land: 1,109,104 sq km
water: 100,210 sq km
note: includes Isla de Malpelo, Roncador Cay, and Serrana Bank. Only South American country with coastlines on both the North Pacific Ocean and Caribbean Sea.
Climate:
tropical along coast and eastern plains; cooler in highlands
Natural resources:
petroleum, natural gas, coal, iron ore, nickel, gold, copper, emeralds, hydropower
Natural hazards:
highlands subject to volcanic eruptions; occasional earthquakes; periodic droughts
Environment - current issues:
deforestation; soil and water quality damage from overuse of pesticides; air pollution, especially in Bogota, from vehicle emissions
Population:
43,677,372 (July 2010 est.)
country comparison to the world: 28
Population growth rate:
1.219% (2010 est.)
Urbanization:
urban population: 74% of total population (2008)
rate of urbanization: 1.7% annual rate of change (2005-10 est.)
Administrative divisions:
32 departments (departamentos, singular - departamento) and 1 capital district* (distrito capital); Amazonas, Antioquia, Arauca, Atlantico, Bogota*, Bolivar, Boyaca, Caldas, Caqueta, Casanare, Cauca, Cesar, Choco, Cordoba, Cundinamarca, Guainia, Guaviare, Huila, La Guajira, Magdalena, Meta, Narino, Norte de Santander, Putumayo, Quindio, Risaralda, San Andres y Providencia, Santander, Sucre, Tolima, Valle del Cauca, Vaupes, Vichada

+ Republic of Colombia. Economic data

Colombia experienced accelerating growth between 2002 and 2007, chiefly due to improvements in domestic security, rising commodity prices, and to President URIBE's promarket economic policies. Foreign direct investment reached a record $10 billion in 2008. A series of policies enhanced Colombia's investment climate: President URIBE's pro-market measures; pro-business reforms in the oil and gas sectors; and export-led growth fueled mainly by the Andean Trade Promotion and Drug Eradication Act. Inequality, underemployment, and narcotrafficking remain significant challenges, and Colombia's infrastructure requires major improvements to sustain economic expansion. Because of the global financial crisis and weakening demand for Colombia's exports, Colombia's economy grew only 2.6% in 2008, and contracted slightly in 2009. In response, the URIBE administration cut capital controls, arranged for emergency credit lines from multilateral institutions, and promoted investment incentives, such as Colombia's modernized free trade zone mechanism, legal stability contracts, and new bilateral investment treaties and trade agreements. The government also encouraged exporters to diversify their customer base beyond the United States and Venezuela, traditionally Colombia's largest trading partners. The government is pursuing free trade agreements with European and Asian partners and awaits the approval of a Canadian trade accord by Canada's parliament. In 2009, China replaced Venezuela as Colombia's number two trading partner, largely because of Venezuela's decision to limit the entry of Colombian products. The business sector remains concerned about the impact of the global recession on Colombia's economy, Venezuela's trade restrictions on Colombian exports, an appreciating domestic currency, and the pending US Congressional approval of the US-Colombia Trade Promotion Agreement.

GDP (purchasing power parity):
$401.5 billion (2009 est.)
country comparison to the world: 29
$401.1 billion (2008 est.)
$391.7 billion (2007 est.)
note: data are in 2009 US dollars
GDP - composition by sector:
agriculture: 9.7%
industry: 37.4%
services: 52.9% (2009 est.)
Unemployment rate:
12% (2009 est.)
country comparison to the world: 130 10.6% (2008 est.)
Population below poverty line:
46.8% (2008)
Distribution of family income - Gini index:
58.5 (2008)
country comparison to the world: 9
Investment (gross fixed):
24.2% of GDP (2009 est.)
country comparison to the world: 53
Agriculture - products:
coffee, cut flowers, bananas, rice, tobacco, corn, sugarcane, cocoa beans, oilseed, vegetables; forest products; shrimp
Industries:
textiles, food processing, oil, clothing and footwear, beverages, chemicals, cement; gold, coal, emeralds
Exports - commodities:
petroleum, coffee, coal, nickel, emeralds, apparel, bananas, cut flowers
Exports - partners:
US 32.45%, Venezuela 17.16%, Netherlands 4.22% (2009)
Imports - commodities:
industrial equipment, transportation equipment, consumer goods, chemicals, paper products, fuels, electricity
Imports - partners:
US 30.61%, China 10.02%, Mexico 8.05%, Brazil 5.92%, France 3.99%, Germany 3.96% (2009)

+ Republic of Colombia. Infrastructure data

"Colombia is passion"
National branding image of Colombia

Airports:
990 (2010)
country comparison to the world: 7
Airports - with paved runways:
total: 116
over 3,047 m: 2
2,438 to 3,047 m: 8
1,524 to 2,437 m: 41
Airports - with unpaved runways:
total: 874
over 3,047 m: 1
Heliports:
2 (2010)
Pipelines:
gas 4,567 km; oil 6,097 km; refined products 3,382 km (2009)
Railways:
total: 3,802 km
country comparison to the world: 45
standard gauge: 150 km 1.435-m gauge
narrow gauge: 3,652 km 0.914-m gauge (2008)
Roadways:
total: 164,257 km (2005)
country comparison to the world: 31
Waterways:
18,000 km (2008)
country comparison to the world: 6
Merchant marine:
total: 17
registered in other countries: 6 (Antigua and Barbuda 2, Panama 4) (2008)
Ports and terminals:
Barranquilla, Buenaventura, Cartagena, Santa Marta, Turbo

+ Bolivarian Republic of Venezuela

Area:
total: 912,050 sq km
country comparison to the world: 33 land: 882,050 sq km
water: 30,000 sq km . on major sea and air routes linking North and South America; Angel Falls in the Guiana Highlands is the world's highest waterfall

Climate:
tropical; hot, humid; more moderate in highlands

Natural resources:
petroleum, natural gas, iron ore, gold, bauxite, other minerals, hydropower, diamonds

Natural hazards:
subject to floods, rockslides, mudslides; periodic droughts

Environment - current issues:
sewage pollution of Lago de Valencia; oil and urban pollution of Lago de Maracaibo; deforestation; soil degradation; urban and industrial pollution, especially along the Caribbean coast; threat to the rainforest ecosystem from irresponsible mining operations

Population:
26,814,843 (July 2010 est.)
country comparison to the world: 45

Population growth rate:
1.508% (2010 est.)
country comparison to the world: 85

Urbanization:
urban population: 93% of total population (2008)
rate of urbanization: 2% annual rate of change (2005-10 est.)

Administrative divisions:
23 states (estados, singular - estado), 1 capital district* (distrito capital), and 1 federal dependency** (dependencia federal); Amazonas, Anzoategui, Apure, Aragua, Barinas, Bolivar, Carabobo, Cojedes, Delta Amacuro, Dependencias Federales**, Distrito Capital*, Falcon, Guarico, Lara, Merida, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Tachira, Trujillo, Vargas, Yaracuy, Zulia
note: the federal dependency consists of 11 federally controlled island groups with a total of 72 individual islands

Ethnic groups:
Spanish, Italian, Portuguese, Arab, German, African, indigenous people

Religions:
nominally Roman Catholic

Languages:
Spanish (official), numerous indigenous dialects

Literacy:
total population: 93%

School life expectancy (primary to tertiary education):
total: 12 years

Education expenditures:
3.7% of GDP (2006)

+ Bolivarian Republic of Venezuela

Economic data

Venezuela remains highly dependent on oil revenues, which account for roughly 90% of export earnings, about 50% of the federal budget revenues, and around 30% of GDP. A nationwide strike between December 2002 and February 2003 had far-reaching economic consequences - real GDP declined by around 9% in 2002 and 8% in 2003 - but economic output since then has recovered strongly. Fueled by high oil prices, record government spending helped to boost GDP by about 10% in 2006, 8% in 2007, and nearly 5% in 2008, before the world recession caused a contraction in 2009. This spending, combined with recent minimum wage hikes and improved access to domestic credit, has created a consumption boom but has come at the cost of higher inflation - roughly 20% in 2007 and more than 30% in 2008. Imports also jumped significantly before the recession of 2009. Declining oil prices in the latter part of 2008 are undermining the government's ability to continue the high rate of spending. President Hugo CHAVEZ in 2008-09 continued efforts to increase the government's control of the economy by nationalizing firms in the agribusiness, banking, tourism, oil, cement, and steel sectors. In 2007, he nationalized firms in the petroleum, communications, and electricity sectors. In January, 2010, CHAVEZ announced a dual exchange rate system for the fixed rate bolivar. The system offers a 2.6 bolivar per dollar rate for imports of essentials, including food, medicine, and industrial machinery, and a 4.3 bolivar per dollar rate for imports of other products, including cars and telephones.

GDP (purchasing power parity):
$349.3 billion (2009 est.)
country comparison to the world: 32
$361.3 billion (2008 est.)
note: data are in 2009 US dollars
GDP - composition by sector:
agriculture: 4%
industry: 36.8%
services: 59.2% (2009 est.)
Unemployment rate:
7.9% (2009 est.)
country comparison to the world: 83
Population below poverty line:
37.9% (yearend 2005 est.)
Distribution of family income - Gini index:
41 (2009)
country comparison to the world: 57
49.5 (1998)
Investment (gross fixed):
22.1% of GDP (2009 est.)
country comparison to the world: 69
Agriculture - products:
corn, sorghum, sugarcane, rice, bananas, vegetables, coffee; beef, pork, milk, eggs; fish
Industries:
petroleum, construction materials, food processing, textiles; iron ore mining, steel, aluminum; motor vehicle assembly
Exports - commodities:
petroleum, bauxite and aluminum, steel, chemicals, agricultural products, basic manufactures
Exports - partners:
US 35.18%, Netherlands Antilles 8.56% (2009)
Imports - commodities:
raw materials, machinery and equipment, transport equipment, construction materials
Imports - partners:
US 23.66%, Colombia 14.43%, Brazil 9.13%, China 8.44%, Mexico 5.47% (2009)

+ Bolivarian Republic of Venezuela

Infrastructure data

National branding image of Venezuela

Airports:
409 (2010)
country comparison to the world: 20
Airports - with paved runways:
total: 129
over 3,047 m: 5
2,438 to 3,047 m: 10
1,524 to 2,437 m: 34
Airports - with unpaved runways:
total: 280
2,438 to 3,047 m: 1
1,524 to 2,437 m: 16
Heliports:
4 (2010)
Pipelines:
extra heavy crude 980 km; gas 5,258 km; oil 6,695 km; refined products 1,484 km; unknown 141 km (2009)
Railways:
total: 806 km
country comparison to the world: 101
standard gauge: 806 km 1.435-m gauge (2008)
Roadways:
total: 96,155 km
country comparison to the world: 47
paved: 32,308 km
unpaved: 63,847 km (2002)
Waterways:
7,100 km
country comparison to the world: 21
note: Orinoco River (400 km) and Lake de Maracaibo navigable by oceangoing vessels (2008)
Merchant marine:
total: 62. foreign-owned: 12 (Chile 1, Denmark 1, Greece 3, Mexico 5, Panama 1, Spain 1). registered in other countries: 12 (Bahamas 1, Panama 10, Saint Vincent and the Grenadines 1) (2008)
Ports and terminals:
La Guaira, Maracaibo, Puerto Cabello, Punta Cardon

+ BIO PHYSICAL COMPONENT: Geography

The origin/end of the Andes range in the final angle of the continent, called the Colombian Massif, the range splits into three major chains of mountains, called according to the direction they take :

+ the **western range**, following the pacific coast and moderately high, reaches an elevation of nearly 13,000 feet at Mount Paramillo before descending in three smaller ranges into the lowlands of northern Colombia.

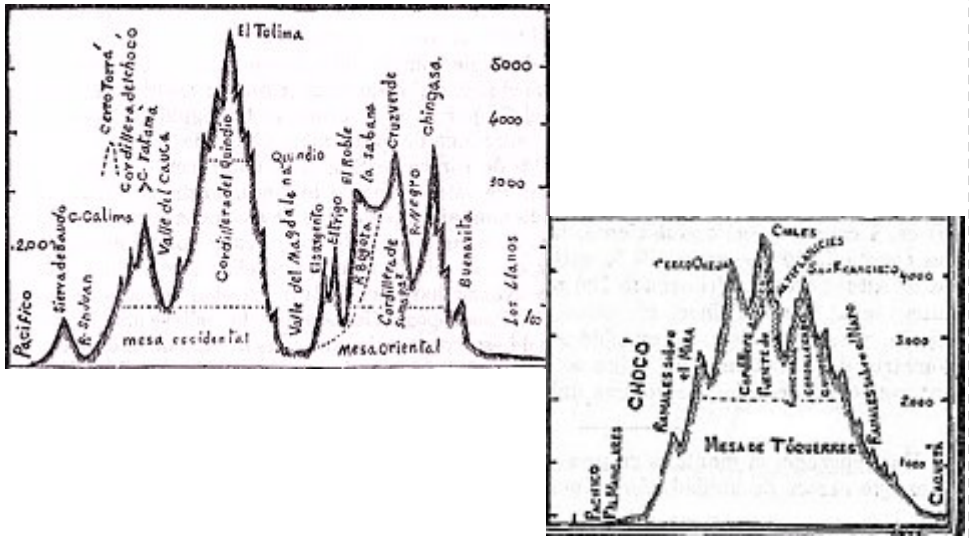
+ the **central range** goes straight, is the highest (average altitude of almost 10,000 feet) but also the shortest range of Colombian Andes, stretching some 400 miles before its most northerly spurs disappears.

+ the **eastern range** trends slightly to the northeast and is the widest and the longest of the three. The average altitude is 7,900 to 8,900 feet. North, the cordillera widens and after a small depression rises into the Sumapaz Uplands, which range in elevation from 10,000 to 13,000 feet. North of the Sumapaz Upland the range divides into two, enclosing a large plain 125 miles wide and 200 miles long, often interrupted by small transverse chains that form several upland basins called ***sabanas*** that contain about a third of Colombia's population. The city of Bogotá is on the largest and most populated of these *sabanas*; other important cities on *sabanas* are Chiquinquirá, Tunja, and Sogamoso. East of Honda the cordillera divides into a series of abrupt parallel chains running to the north-northeast; among them the Sierra Nevada del Cocuy (18,022 feet) is high enough to have snowcapped peaks.

Farther north the central ranges of the Cordillera Central come to an end, but the flanking chains continue and diverge to the north and northeast. The westernmost of these chains is the Sierra de Ocaña, which on its northeastern side includes the Sierra de Perijá; the latter range forms a portion of the boundary between Colombia and Venezuela and extends as far north as latitude 11° N in La Guajira Peninsula.

On the Caribbean coast just west of the Sierra de Perijá stands the isolated, triangular **Sierra Nevada de Santa Marta Massif**, which rises abruptly from the coast to snowcapped peaks of 18,947 feet; geologically, however, the Santa Marta Massif is not part of the Andes.

The Venezuelan Andes are represented by the **Cordillera de Mérida** (280 miles long) which extends in a northeasterly direction to the city of Barquisimeto, where it ends. The cordillera is a great uplifted axis where erosion has uncovered granite and gneiss rocks but where the northwestern and southeastern flanks remain covered by sediments; it consists of numerous chains with snow-covered summits separated by longitudinal and transverse depressions—Sierras Tovar, Nevada, Santo Domingo, de la Culata, Trujillo, and others. The range forms the northwestern limit of the Orinoco River basin, beyond which water flows to the Caribbean. North of Barquisimeto, the Sierra Falcón and Cordillera del Litoral (called in Venezuela the Sistema Andino) do not belong to the Andes but rather to the Guiana system.

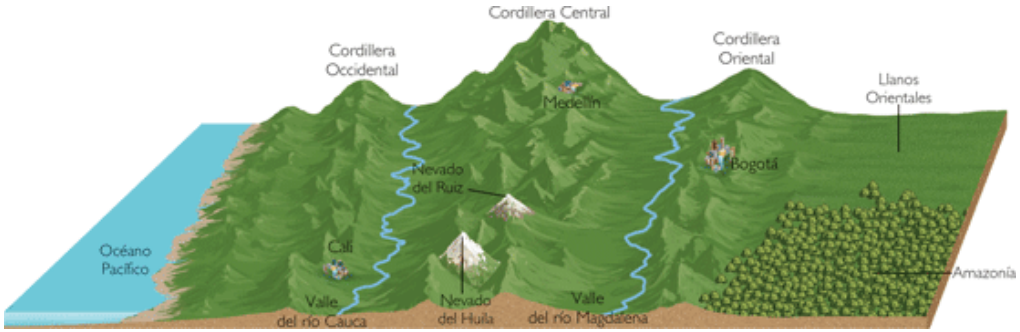


Transverse sections of the norher andes at the high of Colombia

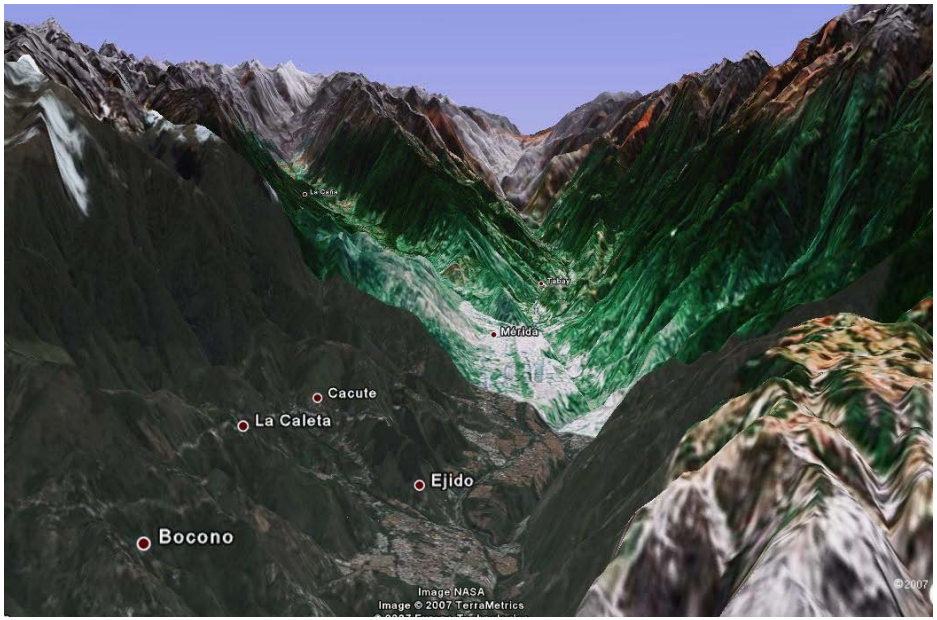
+ BIO PHYSICAL COMPONENT: Geography

+ Inter Andean Valleys (IAV)

Between the Cordilleras Central and Occidental is a great depression, the Patía-Cauca valley, divided into three longitudinal plains. The southernmost is the narrow valley of the Patía River, the waters of which flow to the Pacific. The middle plain is the highest in elevation (8,200 feet) and constitutes the divide of the other two. The northern plain, the largest (15 miles wide and 125 miles long), is the valley of Cauca River, which drains northward to the Magdalena River.
These Andean valleys are primarily 200-1,700 m above sea-level, and as such their natural vegetation comprises open woodland, dry forest and arid scrub; much of the area has, however, now been converted to agricultural land with little natural vegetation remaining. The main *IAV* are situated in Colombia between the main Andean ranges, embracing the **Patía valley** (which separates the Central and West Andes south of Popayán), the **Cauca valley**, and the west side and head of the **Magdalena valley**. The valleys normally lie at high elevations (chiefly 1,200-2,600 m, within a more humid vegetation zone). There are also other valleys such as the isolated **Suárez and Chicamocha valleys** which dovetail with the East Andes.
All three valleys (Cauca, Magdalena and Patía), and the mountain slopes that bound them, have been severely deforested during past decades due primarily to the expansion of agriculture, and it has deeply affected the endemic species of fauna and flora, so attached to this landscapes.



The presence of the **Amazon Forest** in the center-eastern part of the continent define every aspect of the habitability not only in the forest itself, but in the surrounding territories of the countries “touched” by the exuberant (and insalubrious) nature. The geography is strongly marked by the presence of long and plentiful rivers and lots of water corps, that create a varied and humid landscape, being born in the highest points of the mountains and flowing down to the pacific and Caribbean slopes.
The geological origins of the continent also give birth to the so called Cinturón de Fuego del Pacífico (**Pacific Belt of Fire**), which is composed of a series of very serous volcanoes, most of them in activity, that condition the habitability of the communities around them,
Rainforests used to encircle much of the northern Andes but are now greatly diminished, especially in the Chocó area and **inter-Andean valleys of Colombia.**



+ BIO PHYSICAL COMPONENT:

Geography

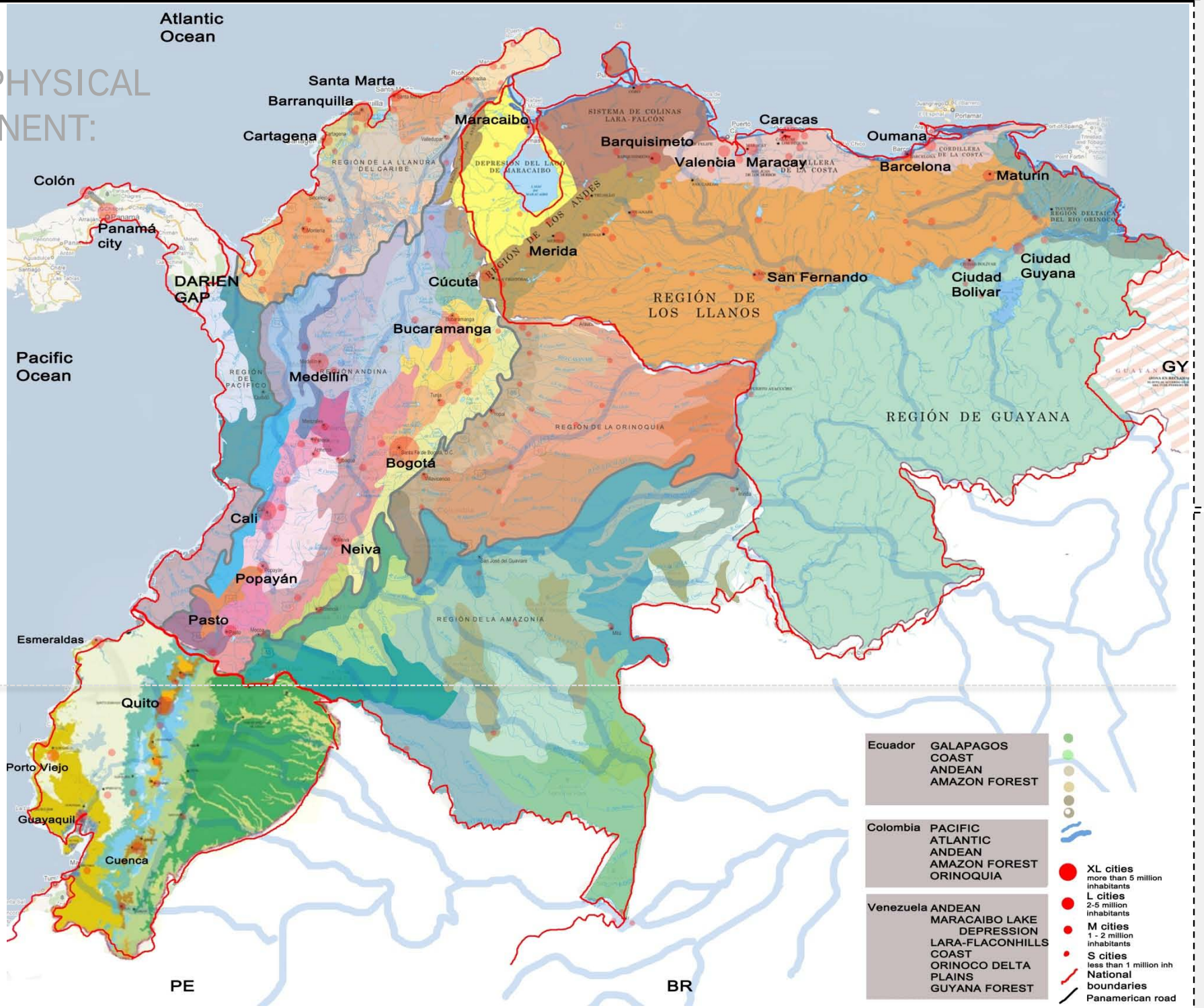
LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ BIO PHYSICAL COMPONENT:

Geography



LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ DYNAMIC COMPONENT:

Society, Traces of a Common Past

South American Settlement models, and the general South American cultures, are the result of **several processes** of waves of migrations, invasion, colonization, independence wars, that prepared a **mixed and eclectical territorial products,** such as the actual cities, in whoms patterns can be identified 5 main cities that co-live togheter, sometimes in peace, sometimes not so much.

1. PRE HISPANIC AMERICA:

+ The Inca civilization and other native communities

2. HISPANIC AMERICA:

+ The colonial settlements

3. POST INDEPENDENCE URBANITY

+ America for Americans

4. LATE INDUSTRIALIZATION

+ Railways, industrial cities and urbanization processes

5. THE AMERICAN DREAM

+ The highway systems and sprawl

There are not certainties in the theories of the Settlement of America, but the most accepted theories follow the path of the south Asians who crossed the Bering Strait (or in somehow, the pacific ocean) during the glacial era, and settled all the way down to central and south America. Another theory, or second migration wave, follow the path from south Asia through the "infinite island chains" of the Pacific, as proved on the ***Pascua island .***

Peruvian kids

Philippine kids

1. PRE HISPANIC AMERICA The Inca civilization

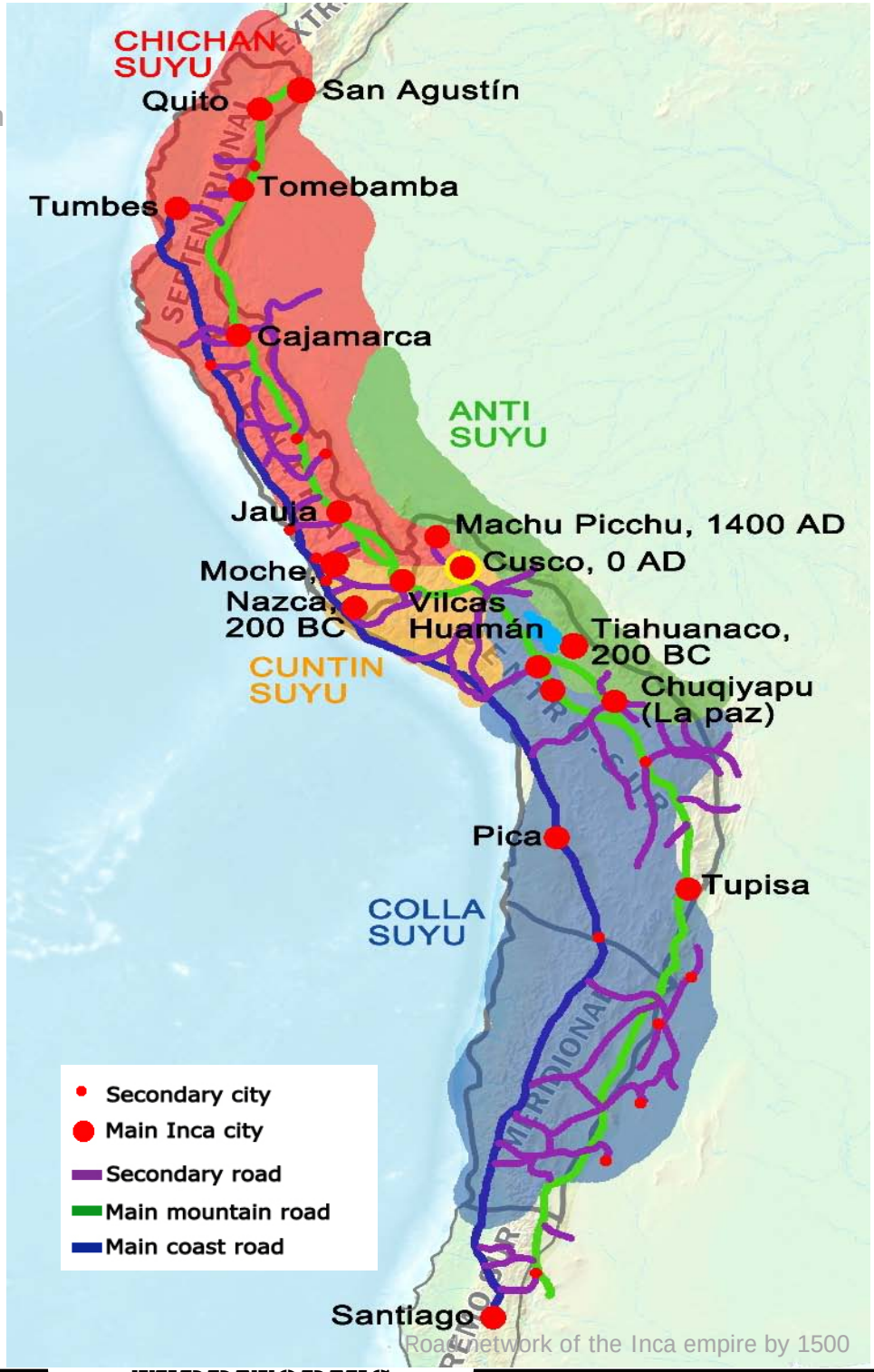
The **Inca civilization** began as a tribe in the Urubamba valley area, where the legendary first Sapa Inca (Inca king), Manco Capac founded the Kingdom of Cusco around 1200 AD. Under the leadership of the descendants of Manco Capac, the Inca state grew to absorb other Andean communities. In 1442, the Incas began a far-reaching expansion under the command of Patchacuti. He founded the Inca Empire as known today, which became the largest empire in pre-Columbian America. The Incas named their empire the 'Land of the Four Quarters", in quechua, the **Tawantinsuyu**.

It stretched north to south some 2,500 miles along the high mountainous Andean range from Colombia to Chile and reached west to east from the dry coastal desert called Atacama to the steamy Amazonian rain forest. The Inca territory is mainly placed over the Andean range, at regular altitudes up to 15,000 feet and extended up to 22,057 feet to Llullaillaco in Chile, the highest Inca sacrificial site known today.

The territories conquered by the Incas, where all communicated in walk-by road system, which is referred to as an 'all-weather highway system' of over 14,000 miles of roads. This central nervous **system of Inca transport and communication** rivaled only that of Rome. Much of the system was the result of the Incas claiming exclusive right over numerous traditional routes, some of which had been built centuries earlier. Many new sections were built or upgraded substantially: through Chile's Atacama desert, and along the western margin of Lake Titicaca. A high road crossed the higher regions of the andean range (known as Qhapaq Ñan in quechua, or Camino Real in spanish). It constituted the principal north-south highway of the Inca Empire traveling 6,000 km (3,700 mi) along the spine of the Andes.

Another lower road crossed the coastal plains. Shorter crossroads linked the two main highways together in several places.

The Qhapaq Ñan unified this immense and heterogeneous empire through a well-organized political system of power. It allowed the Inca to control his Empire from the central capital, **Cusco**.



Road network of the Inca empire by 1500

TERRITORIES

LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

1. PRE HISPANIC AMERICA The Inca civilization

The **Tawantinsuyu** was a federalist system which consisted of a central government with the Inca at its head and four provinces: Chinchan Suyu (NW), Anti Suyu (NE), Cuntin Suyu (SW), and Colla Suyu (SE). The four corners of these provinces met at the center, Cusco. Each province had a governor who oversaw local officials, who in turn supervised agriculturally-productive river valleys, cities and mines.

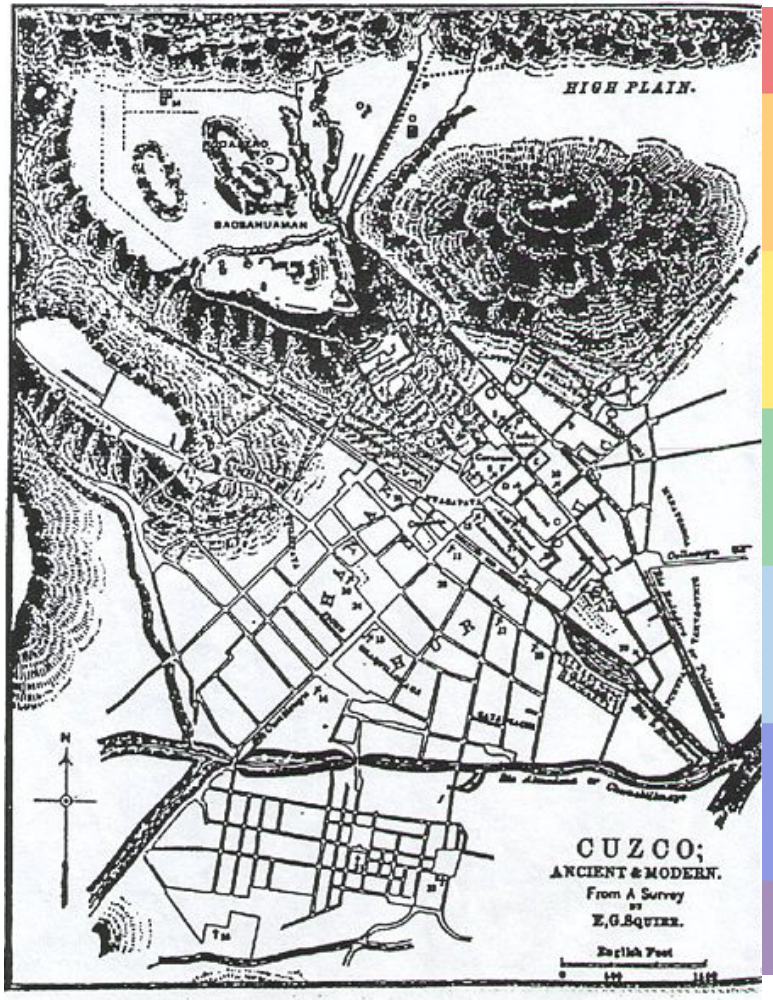
The Incas, although all their advanced technologies in building, did not built major cities. The population remained essentially rural, with numerous small villages and towns housing less than 1000 people, until the arrival of the spanish conquers in 1530. The capital city, Cusco, was occupied only by members of the Sapa Inca's court, family and holy priests, all directly descendents of the sun. The city was mainly used for the government.

The inca people never lived on this main cities, because this were for them sacred ceremonial spaces, used for festivals or business. All the records for nearby villages were reported by their leaders and recorded in the city by the quipucamayoc.

In the outskirts of the main cities, there were artisans' quarters, government storehouses and soldiers' barracks. There, the metalworkers, carpenters, weavers and other crafters could work making artwork for the temples.

The rest of the population lived in satellite hamlets, where they built terraces and irrigation canals to grow mainly maize and potatoes.

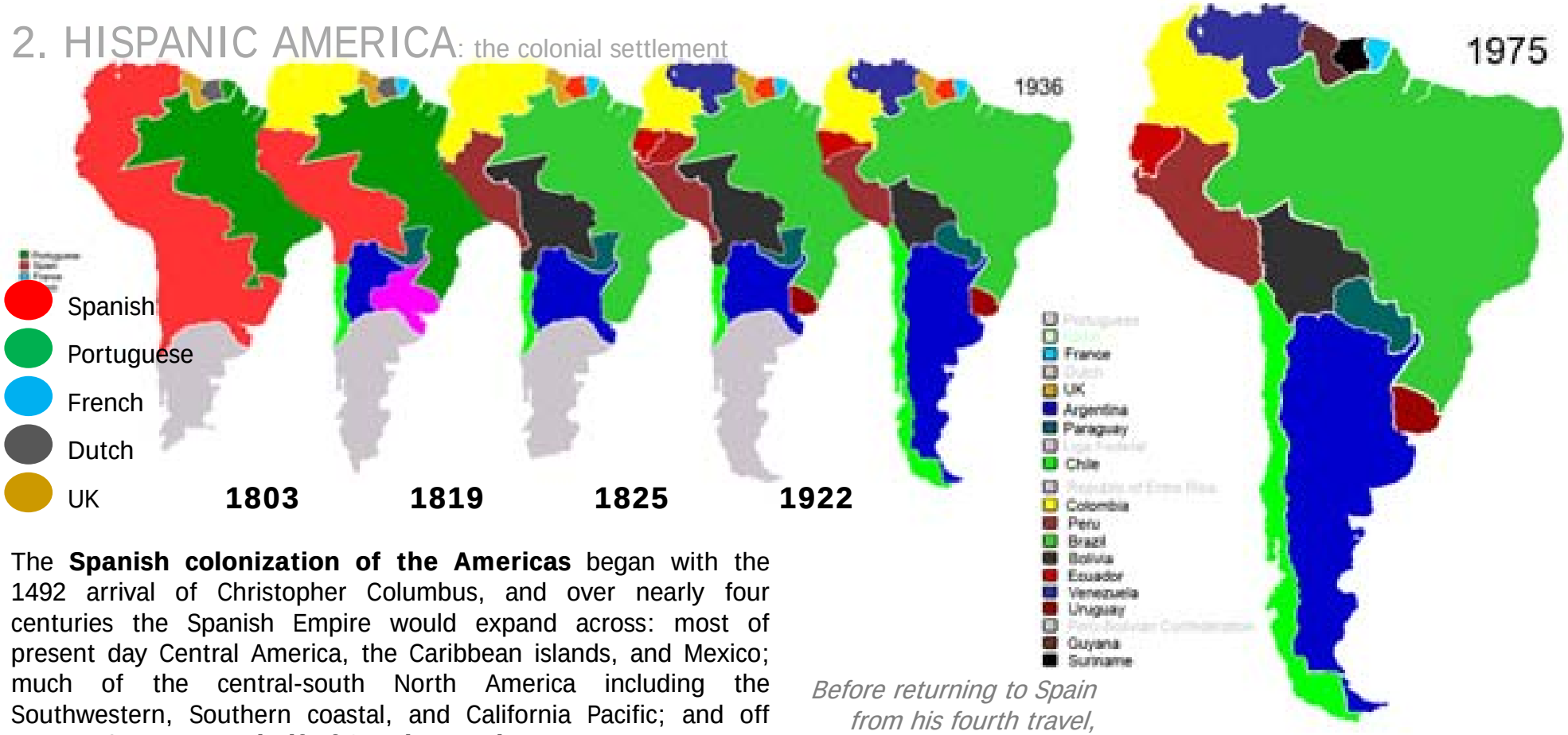
Machu Picchu ceremonial center – Agricultural terraces



Map of Cusco city by 1860 – Official flag of Cusco

Map of central Cusco today

2. HISPANIC AMERICA: the colonial settlement



The **Spanish colonization of the Americas** began with the 1492 arrival of Christopher Columbus, and over nearly four centuries the Spanish Empire would expand across: most of present day Central America, the Caribbean islands, and Mexico; much of the central-south North America including the Southwestern, Southern coastal, and California Pacific; and off course, the **western half of South America**.

In the early 19th century the wars of independence, leader by ***Bolivar and San Martín*** liberated all the Spanish colonies in the Americas, except for Cuba and Puerto Rico later in 1898. Spain's loss of the last two in the Spanish-American War politically ended Spanish colonization in the Americas. **The strong cultural influences, such as the language and religion though, still remain.**

In the "discovery" process, spanish explorers encountered several Native American cities as large and as complex as any in Europe, but destroyed them in the name of the *civilization* of the native indigenous, to gain the territorial and cultural control of the new found lands.

Before returning to Spain from his fourth travel, Columbus ordered his men to build the first European construction in the Americas: Santa Maria Antigua del Darién (today between Panama and Colombia) being no longer seaworthy, was turned upside down on the beach, dragged up the coast, and recycled into a fort housing the first Spanish settlers.

Map of Santa Maria city (first hispanic City in America, today lost)

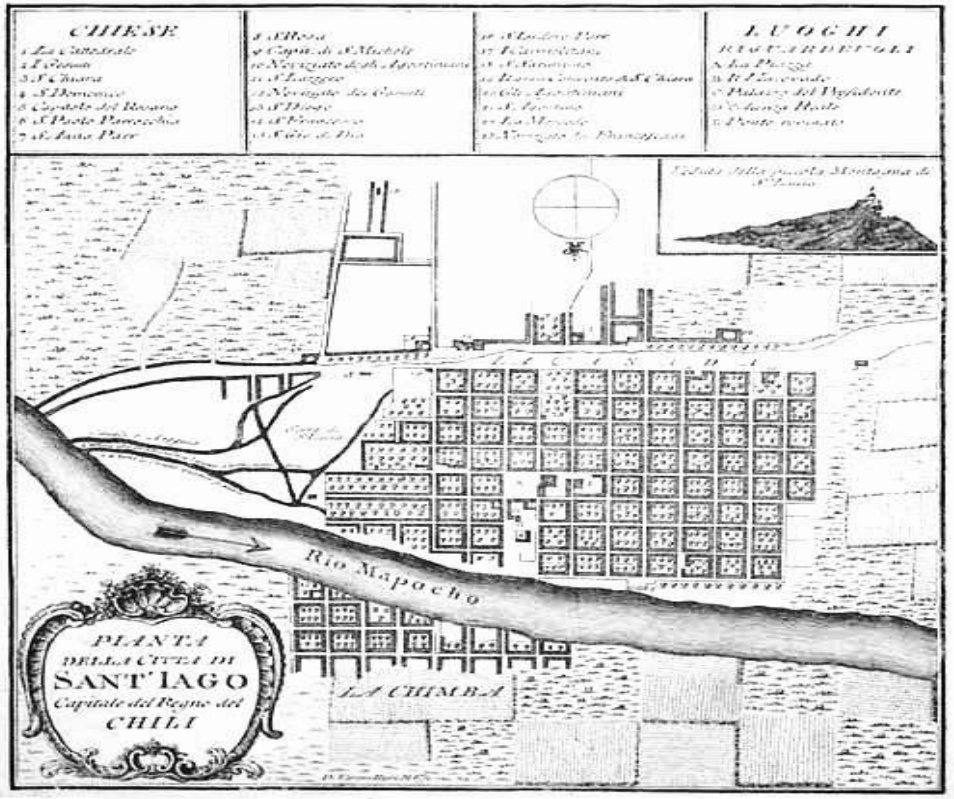
2. HISPANIC AMERICA: the colonial settlement

By the end of the 16th century, many of the major cities now existing in Latin America had been established. Spanish and Portuguese settlers created and developed Amerindian cities according to the pre established Renaissance grid system. Generally speaking, these cities shared a grid plan featuring large, open squares defined by a cathedral and other institutional buildings. By contrast, architects and planners in European cities were often limited by the existing medieval urban fabric in the application of this model.

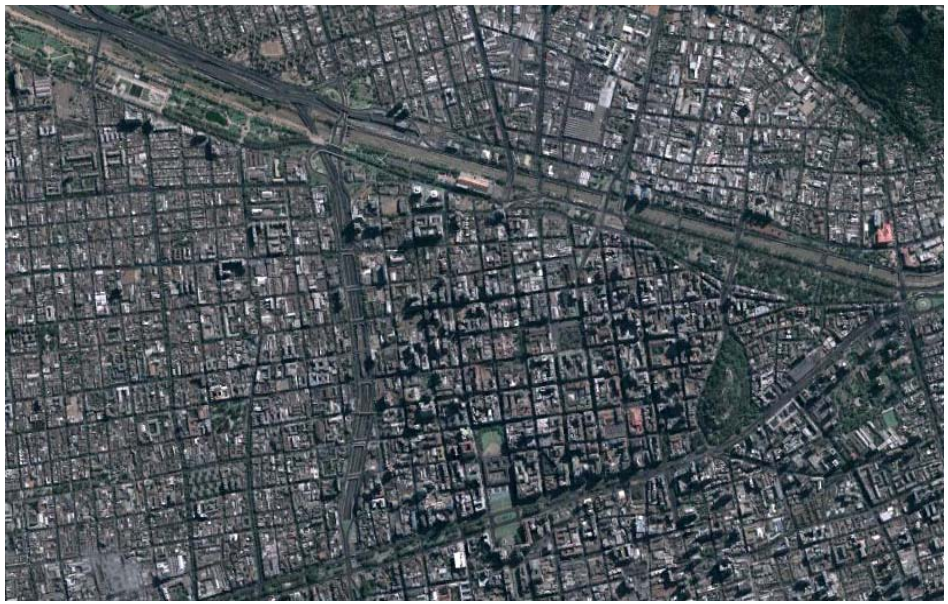
The first laws to regulate the new settlements for Spanish people were the ***The Colombus model*** in where there were "extraction sites" . Then in the early XVI century, with the ***Ovandino*** **code**, the land colonization and distribution began, including also the indigenous populations inhabiting the territories, and the official foundation of cities, using the roman rectangular grid as base, with the **Plaza de Armas** as the main center, where the church ruled all the civil life. The application of this grid system in Latin America was eventually enforced by the **Laws of the Indies**, a series of guidelines formulated by Spain for the planning and development of all new American cities as well as for the adaptation of the old Amerindian capitals. These laws promoted the ideal of the pure geometry of the Renaissance city.

The founding of new towns and the construction of large monasteries in the new world provided an opportunity for enlightened European settlers to realize some of the utopian ideals of Renaissance planning.

The colonial cities were for the colonizers a center of entrepreneurial activity and wealth, that drew people seeking a better life, with more educational, occupational, commercial, bureaucratic, and marital possibilities than were available in the rural regions of Spain.



Plan of the city of Santiago, 1777



Historical center of Santiago today

+ Post independence urbanity

America for Americans

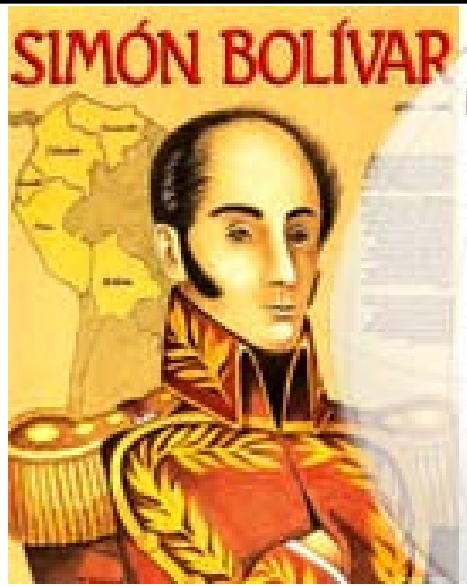
By the beginning of the XX century, the bigger part of South America was already free of European control. The ***criollos*** (descendents of spanish, born in America) had taken the government of their territories, having as a reference the new born United States of (north) America and their constitution.

La Gran Colombia, Bolivar's dream

Gran Colombia (*Great Colombia*) is a name used today for the state that encompassed much of northern South America and part of southern Central America from 1819 to 1831. This short-lived republic included the territories of present-day republics of **Colombia, Venezuela, Ecuador, and Panamá.** The first three were the successor states to Gran Colombia at its dissolution. Since its territory corresponded more or less to the original jurisdiction of the former *Viceroyalty of New Granada*, it also claimed the Caribbean coast of Costa Rica, the Mosquito Coast, "Guayana Esequiba" in Guyana and parts of what are now Peru and Brazil.

The Constitution of the new republic was given in 1821 in the Congress of Cucuta, establishing it's capital in Bogota. A new territorial division (various departments corresponding to Venezuela, New Granada and Quito) was conceived. The famous general **Simon Bolivar** was elected president and Francisco de Paula Santander vice-president. In the first years of existence, Gran Colombia helped other provinces still in war with Spain to become independent, so Panama came to the federation in 1821 and so did the remaining provinces corresponding to Quito and to Venezuela. The independence of Peru was consolidated through Gran Colombia's aid.

Its existence was marked by a struggle between those who supported a centralized government with a strong presidency and those who supported a decentralized, federal form of government.



At the same time another political division emerged between those who supported *the Constitution of Cúcuta* and two groups who sought to do away with the Constitution, either in favor of breaking up the nation into smaller republics or maintaining the union but creating an even stronger presidency. The faction that favored constitutional rule coalesced around Santander, while those who supported the creation of a stronger presidency were led by Bolívar. The two men had been allies and close friends in the war against Spanish rule, but by 1825 their differences had become public and were an important part of the political instability from that year onward.

The Republic of Gran Colombia was Bolivar's initial attempt of creating **one single South American state**. Other South American politicians objected to his idea and Bolívar, disgruntled, resigned in 1828. The federation was dissolved in 1830, despite the efforts of general Rafael Urdaneta in Bogota, due to the strife between the different regions which strengthened after Bolívar's resignation. In 1863, after the dissolution, New Granada, changed its name officially to "United States of Colombia", and in 1886 adopted its present day name: "Republic of Colombia". Panama remained as a province of this country until 1903, when it became independent, sponsored by the U.S. because of the interest in the construction of the Panama channel.

+ La Gran Colombia, Bolivar's dream

*The original official name of the country was the **Republic of Colombia**.*

Historians have adopted the term "Gran Colombia" to distinguish this republic from the present-day Republic of Colombia, which began using the name in 1863, although many use "Colombia" where confusion would not arise.

The name "Colombia" comes from the Spanish version of the eighteenth-century New Latin word, "Columbia," itself based on the name of Christopher Columbus. It was the term preferred by the revolutionary Francisco de Miranda as a reference to the New World, especially to all American territories and colonies under Spanish rule. He used an improvised, quasi-Greek version of the name, Colombeia, meaning "papers and things relating to Colombia," as the title of his archive of his revolutionary activities. Bolívar and other Spanish American revolutionaries also used the word "Colombia" in the continental sense. The establishment of a nation with the name Colombia by the 1819 Congress of Angostura gave the term a specific geographic and political reference.

+ DYNAMIC COMPONENT:

Society 2010

The region of the northern Andes, and Latin America in general, is facing unprecedented urban growth. In 2003 the total population was reported as 119 million inhabitants, with 1.8% annual population growth for 1994-2003. Colombia, the most densely populated country in the region, accounted for 37% of the total population.

With the population doubling between 1970 and 2001, the number of city dwellers increased nearly threefold over the same period, growing from 32 million to 85 million inhabitants. In 2003 the urban population accounted for 76% of the total regional population, up from 71.6% in 1994. The United Nations Development Programme (UNDP) estimates that city dwellers will account for 79% of the total population by 2015.

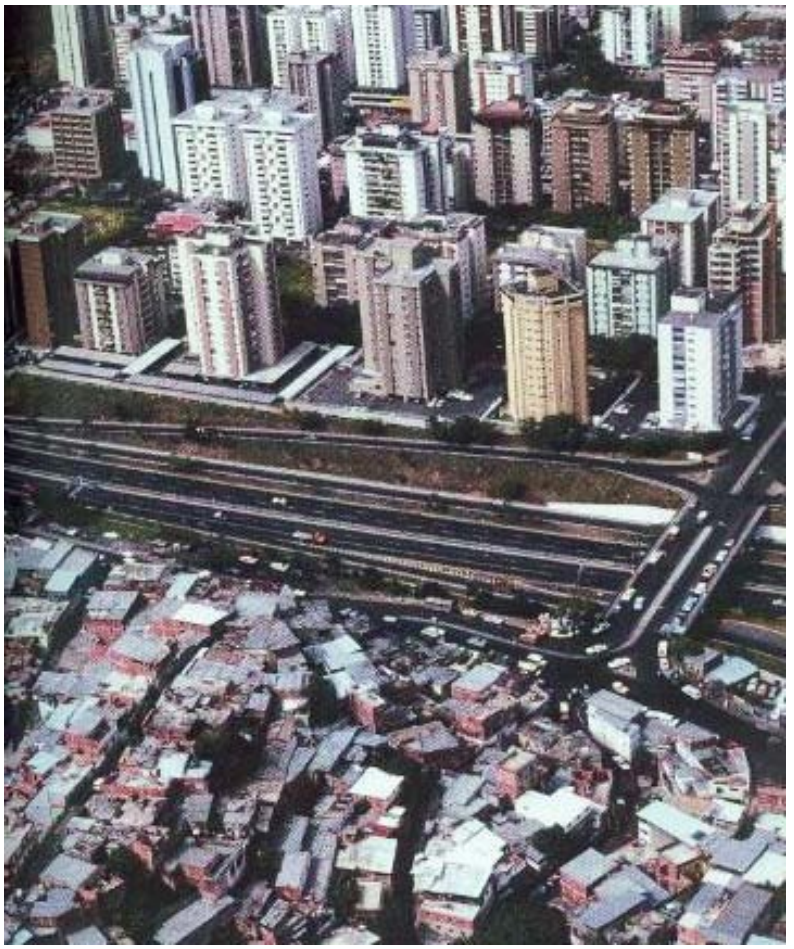
There are two types of urban development in the region: **"Decentralised" urban development** is characterized by the presence of several large cities in a given country that offer a variety of services (healthcare and education, for instance) and opportunities for employment. Services and the availability of jobs are the main incentives for individuals to migrate to urban areas. This type of development is encountered in Colombia, with several large cities such as Medellin, Cali, Cartagena and Barranquilla, as well as the capital Bogota (the biggest urban center of the northern Andes). On the other hand, **"Centralised" urban development** characterizes countries that have only one major urban area, such as in Peru, where 29% of the country's population is concentrated in Lima. This type of development places increased demands on public services, housing and infrastructures and generates increased pressure on the environment (a lack of or inadequate sewage treatment reduces water quality; increased solid waste without the appropriate disposal systems affects soil and air quality).

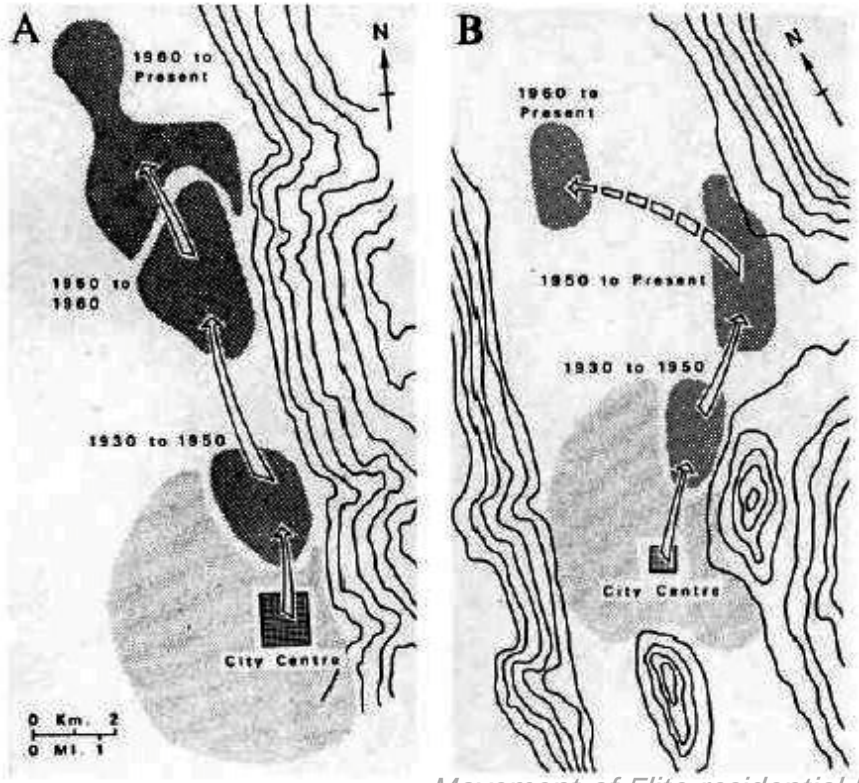
The **rural poor who migrate to urban areas** live in shanty towns, generally built on vacant land from light construction materials such as wood. The underlying ground (sandy hills, for instance) is often unstable and structures are often built with no technical guidance. The resulting situation generates additional pressure on the environment. As in other developing areas, poverty is a crucial issue. Venezuela has the highest proportion of people too poor to afford even food (23%), followed by Ecuador and Colombia (20% each).

+ DYNAMIC COMPONENT:

Society

As in Anglo-America and Europe, some of the largest metropolitan areas have recently begun to show a decline in population in their *central areas* associated with the combined loss of housing stock brought about physical decay and urban redevelopment. This has been partly caused by the movement of the elite, but in contrast to Anglo-America and Europe, the phenomenon has had neither the same impact on the centre's decline nor in the formation of low density settlements on the urban fringe. This is due to the fact that upper-income groups are a minority of the total urban population in Latin America, but also because the city centre continues to serve as a market district and low-income shopping zone.





Movement of Elite residential locations in A. Bogotá and B. Quito, Joana Xavier,
Urban Growth in Latin American Cities

+ ARTIFICIAL COMPONENT: Morphology

The urban morphology of the Latin-American cities, specially the north andean ones, can not be explained as **any pure - logical Anglo-Saxon or European model/style**, even when they have been strongly "colonialized" and idealized in the very different contextual territories of the new world.

There is no doubt for anyone that the actual cities in Latin America are the convergence and mixing of many cultures and imported styles, but also the lack and indifference on the planning and urban coordination. In fact, the Third World cities in general are known for their inherent chaotic and discontinuous spatial patterns, and their rapid and unorganized development process.

Although urban growth and urbanization have been frequently studied as a general issue, the focus of these studies differs according to the geographical location of the object of study. Making a rough generalization, one could say that existing approaches and theories could be divided between First and Third Worlds, or North and South of the planet. It is necessary to note, however, that urban research on 'South' and 'North' have shown different levels of theoretical authority, with a clear predominance of research on urban problems of the north.

Although, urbanization in Latin America as a whole has not been a homogeneous process, and to recognize the differences that exist between Latin American countries. Virtually all the cities in Latin America with a million or more inhabitants had much slower population growth rates during the 1980s than the average for the period 1950 to 1990.

The patterns of urbanization can be read by the demographic trends, and such patterns can be defined mainly by a process of de-concentration of the population including a fall in the overall rate of population growth, a reduced concentration of population in the core of metropolitan areas coupled with significant growth of small and medium-sized municipalities, and a declining rate of demographic growth in regional capitals and major urban centers.

+ LATIN AMERICAN CITY PATTERNS ::

+ The phenomenon of **peripheral growth**, which has been recognized by Latin American researchers and planners and termed 'peripherisation', can now be considered as an established process of growth of most Latin American cities. Peripherisation can be defined as a kind of growth process characterized by the expansion of borders of the city thorough the massive formation of peripheral settlements, which are, in most cases, large spontaneous low-income residential areas.

+The **segregated pattern** probably originated in the colonial city. At that time, The morphology of the Latin American city was created by a traditional grid plan that prevailed so long as the characteristics of urbanization were slow growth, minimal industrialization, limited provision of public services, and restricted Mobility. The colonial city spatial pattern was already segregated. While the high income groups were located close to the square, which was the governmental, commercial and ecclesiastic centre of the city, the lower income areas were further out at the edge of the city.

+ The spatial pattern of the Latin American city evolved from the colonial pattern to a **core-periphery** one. This change occurred in the late nineteenth century when some structural changes began in most Latin American cities. According to Amato (1970b), the breakdown of the colonial land use model was caused by the movement of the upper class who, during the twentieth century, have gradually migrated away from the central city to occupy suburban housing.

From the 80's and on, the patterns of urban growth and livability, have not been so easy to easy to identify, as much for the continuous migrations from the rural to the urban, as for the rapid changes in the economies and other social factors that affected must of the western world urban areas. Although the social segregation is still the main dynamic that rules the urban construction.

+ ARTIFICIAL COMPONENT: Morphology

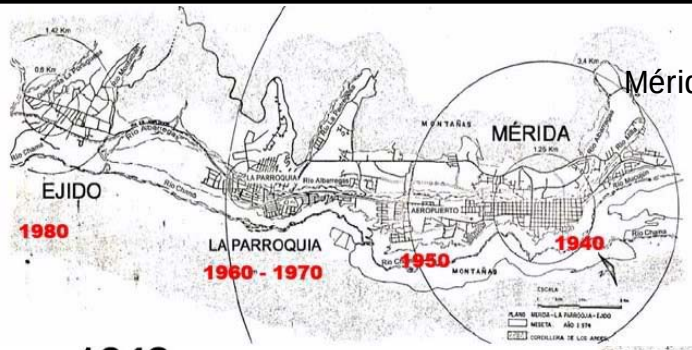
1948

1970

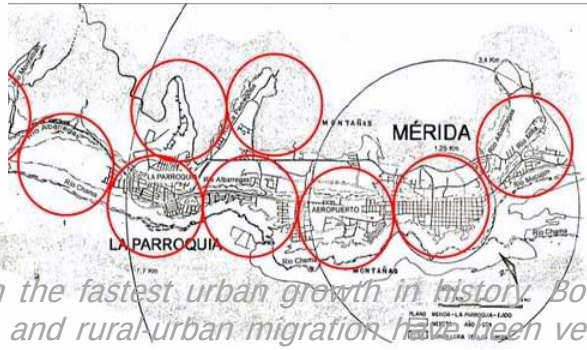
1985

2006

Medellin (CO): urban growth and new policentrism



Mérida (VE), urban growth and new polycentrism



Latin America has seen the fastest urban growth in history. Both rates of natural growth and rural-urban migration have been very high. Latin American countries went from being ***predominantly rural to predominantly urban*** *within a couple of decades, with high concentrations of urban population in cities with more than one million inhabitants.*

From the 1940s to the 1980s, was characterized by the center-periphery pattern. During this period, the city had different social groups separated by great distances. While the middle and upper classes were located in central and well-equipped neighborhoods, lower income groups were living on the city's outskirts. This is the best known pattern of Latin American cities, and it is still widely considered as their predominant urban form. Despite this fact, Caldeira (2000) suggests that a third form has been taking shape since the 1980s and argues that it has already exerted considerable influence on São Paulo and its metropolitan region. According to her, the recent transformations are superimposed on the center-periphery pattern and are justified by the fear of violent crime. In this pattern, different social groups are again closer to one another but are separated by walls and technologies of security. Moreover, the groups tend not to circulate or interact in common areas. The main instruments for this new pattern of spatial segregation are what Caldeira (2000) calls 'fortified enclaves', which are privatized, enclosed, and monitored spaces for residence, consumption, leisure, and work. These spaces "appeal to those who are abandoning the traditional public sphere of the streets to the poor, the marginalized, and the homeless" (Caldeira, 2000).

Joana Xavier, Urban Growth in Latin American Cities

+ ARTIFICIAL COMPONENT:

evolution of the settlement model

Map of the network of cities, by the year of 1824

LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ ARTIFICIAL COMPONENT:

Settlement model

LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ ARTIFICIAL COMPONENT:

Settlement model

	city name	country	surface area km2	inner inhabitants	urban density inh/km2	total metropolitan area inhabitants
1	Bogotá	Co	1775	6.776.009	3817,5	7.881.156
2	Caracas	Ve	823	3.205.463	3894,9	4.205.463
3	Medellín	Co	380	2.636.101	6937,1	3.729.970
4	Cali	Co	562	2.232.158	3971,8	2.963.000
5	Maracaibo	Ve	557	2.201.727	3952,8	2.950.400
6	Barranquilla	Co	168	1.148.506	6836,3	2.521.517
7	Guayaquil	Ec	316	1.985.379	6282,8	2.500.000
8	Quito	Ec	352	1.640.478	4660,4	2.215.000
9	Valencia	Ve	623	994.204	1595,8	1.845.700
10	Maracay	Ve	311	1.300.000	4180,1	1.400.200
11	Cartagena	Co	570	895.400	1570,9	1.300.149
12	Barquisimeto	Ve	1600	1.200.000	750,0	1.350.022
13	Bucaramanga	Co	154	523.040	3396,4	1.074.929
14	Cúcuta	Co	1142	685.543	600,3	918.942
	Santa Marta	Co	2381	414.387	174,0	700.000
	Pereira	Co	702	457.103	651,1	673.000
	Mérida	Ve	60	204.879	3414,7	600.000
	Ibagué	Co	1440	495.146	343,9	495.146
	Popayán	Co	452	258.653	572,2	417.797
	Cuenca	Ec	120	331.038	2758,7	483.867
	Pasto	Co	1181	382.618	324,0	382.618
22	Manizales	Co	571	388.525	680,4	
	Neiva	Co	1533	330.487	215,6	
	Viejo	Ec	945	100.549	106,4	261.000

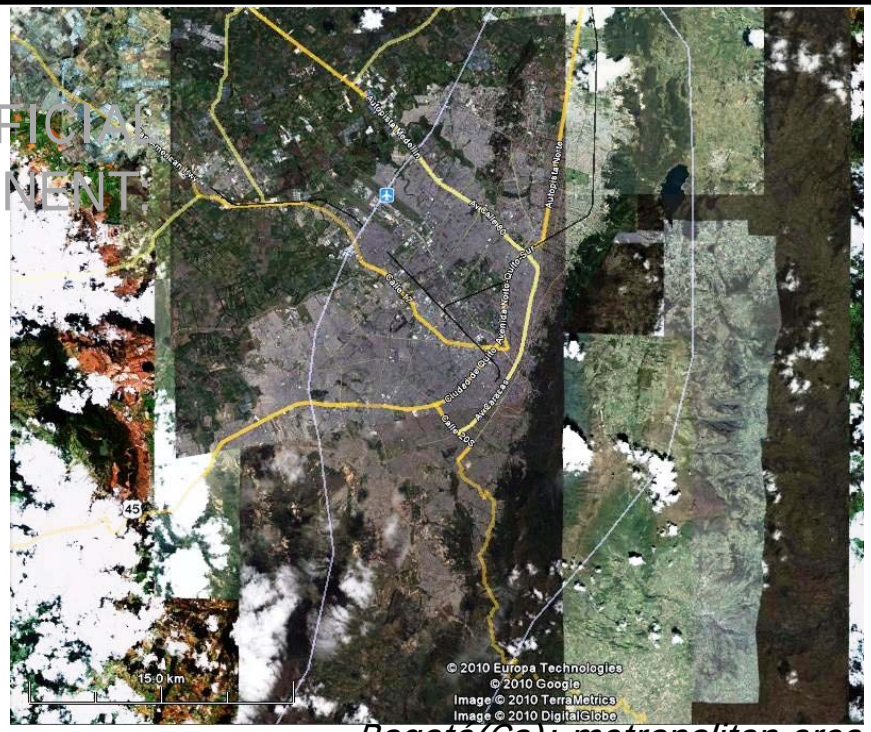
LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ ARTIFICIAL
COMPONENT

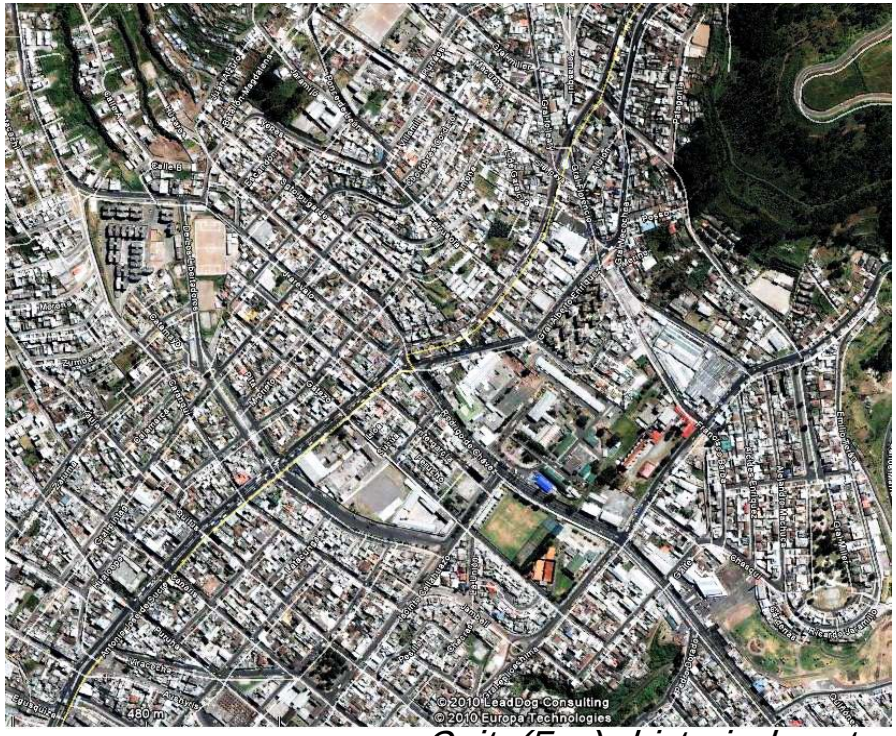
Morphology



Bogotá(Co): metropolitan area

Bogotá(Co): historical center

Quito(Ecu): metropolitan area



Quito(Ecu): historical center

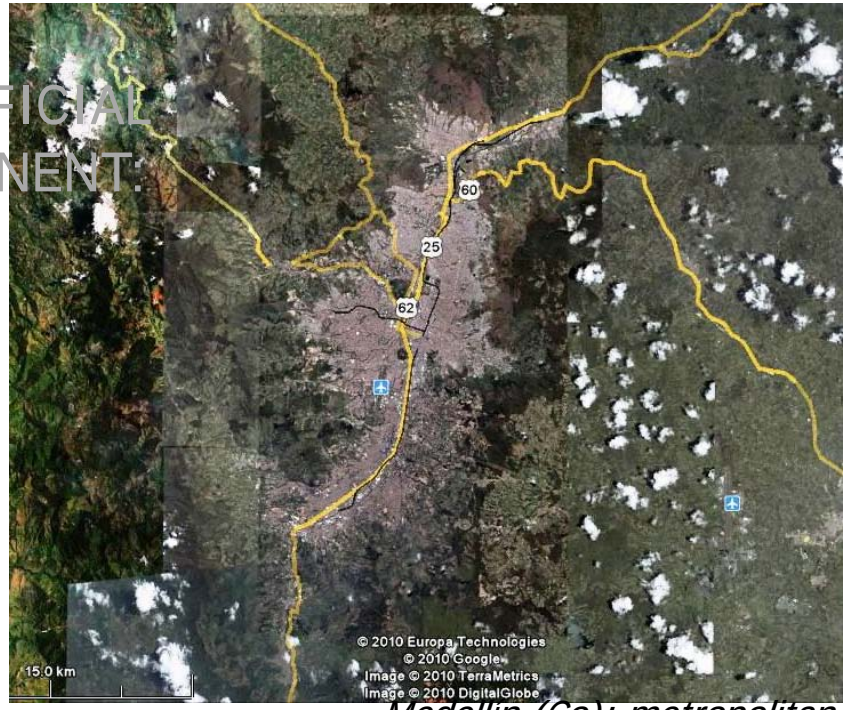
LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ ARTIFICIAL COMPONENT:

Morphology



Medellín (Co): metropolitan area

Medellín (Co): historical center

Mérida (Ve): metropolitan area

Mérida (Ve): historical center

LOMBARDIA - TICINO CITY

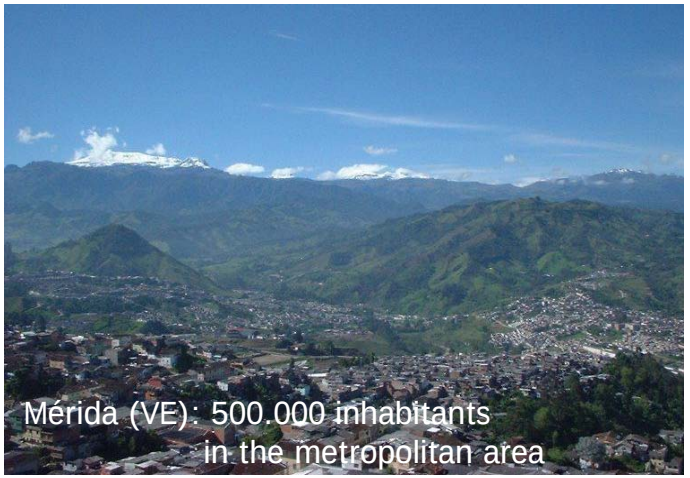
NORTHERN ANDEAN CITY

TERRITORIES

+ ARTIFICIAL COMPONENT:
Landscape


Manizales (CO): 388.525 inhabitants


Ambato (EC): 344,329 inhabitants


Mérida (VE): 500.000 inhabitants
in the metropolitan area

Middle size cities on the IAV

The landscape of the cities is for sure extremely determined by the staggered and sloped geography, the extended presence of water courses that flow from the mountains down to the vallyes and the socio-cultural conditions of the communities that inhabit this territories. Historically the cities have developed in the crossing of commercial routes, or where pre hispanic communities inhabited before the colonization processes. The posterior political struggles to manage and own the productive lands between the governing classes, gave space for the formation of large communities. As common denominator, the cities over the Andes present them selves as compact cities, but dynamics are determined by strong socio-spatial segregation, where the different economical and social classes (historically dictated by the ethnics or skin color) segregate them selves in isolated areas of the cities.


Cali (CO): 2,232,158 inhabitants

+ ARTIFICIAL COMPONENT:

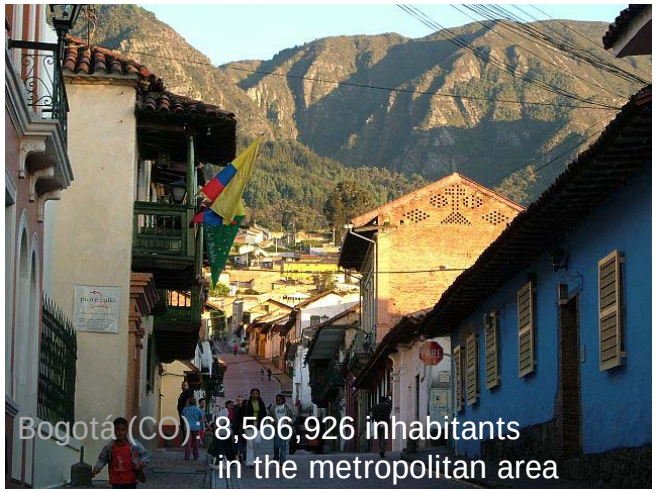
Landscape

Mega cities over the Andes

... In Bogotá, as in the rest of the country, the acceleration of the urbanization process is not only due to industrialization, since there are complex political and social reasons such as poverty and violence which led to migration from rural to urban areas throughout the twentieth century and beyond. This has led to an exponential growth of population in urban areas and belts of misery in their surroundings. A dramatic example of this is the number of displaced people who have arrived in Bogotá. According to the Consultancy for Human Rights, Codhes, in the period 1999-2005 more than 260,000 people arrived in Bogotá as a result of displacement, about 3.8% of the total population of Bogotá. The majority of the displaced population lives in the Ciudad Bolívar, Kennedy, Usme, and Bosa sections (south of the city).

Medellin (CO): 3.729.970 inhabitants in the metropolitan area

Quito (EC): 2,215,820 inhabitants in the metropolitan area

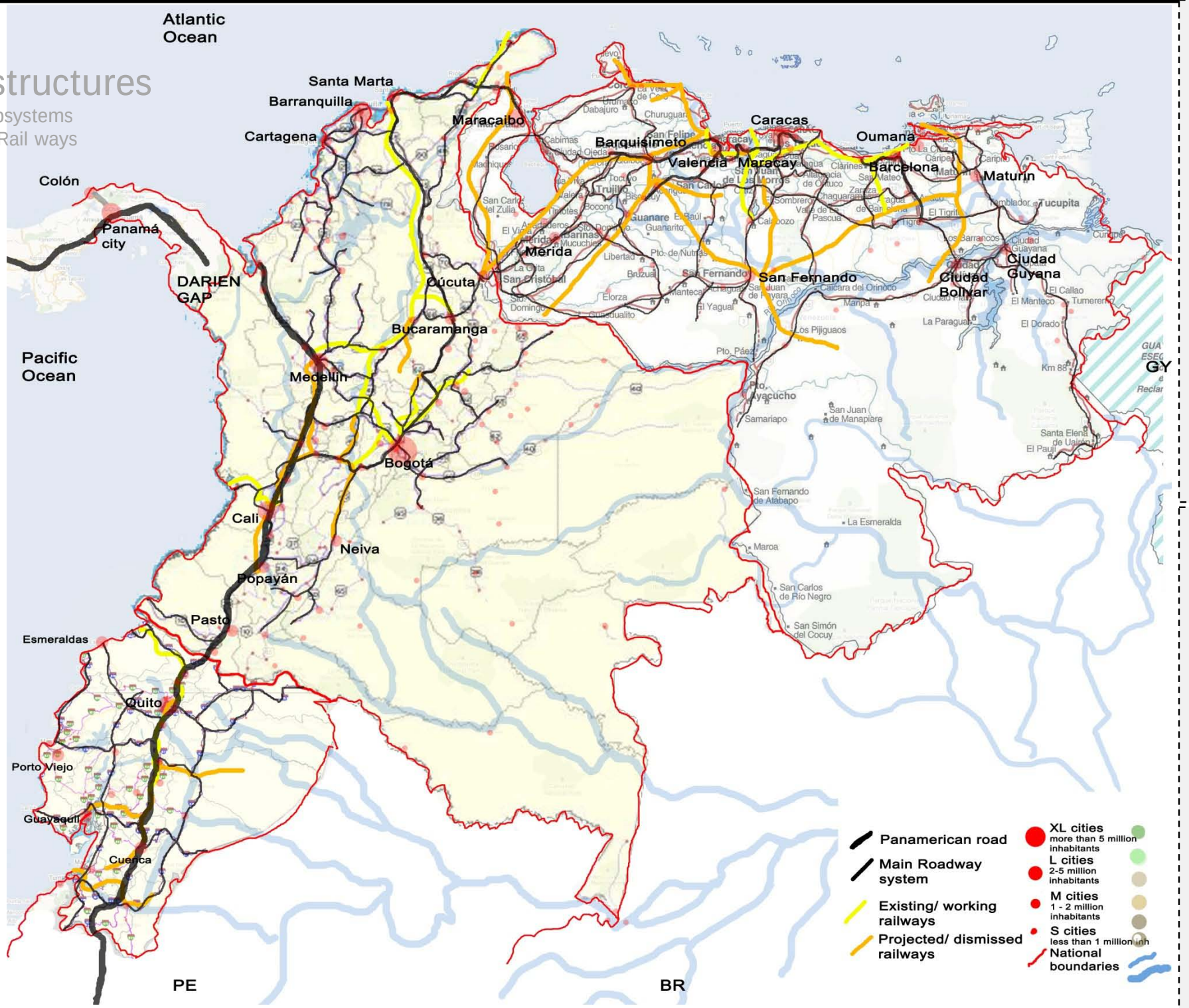


Bogotá (CO): 8,566,926 inhabitants in the metropolitan area

Bogotá : capital district

+ Infrastructures

Layers/Subsystems
Road and Rail ways



LOMBARDIA - TICINO CITY

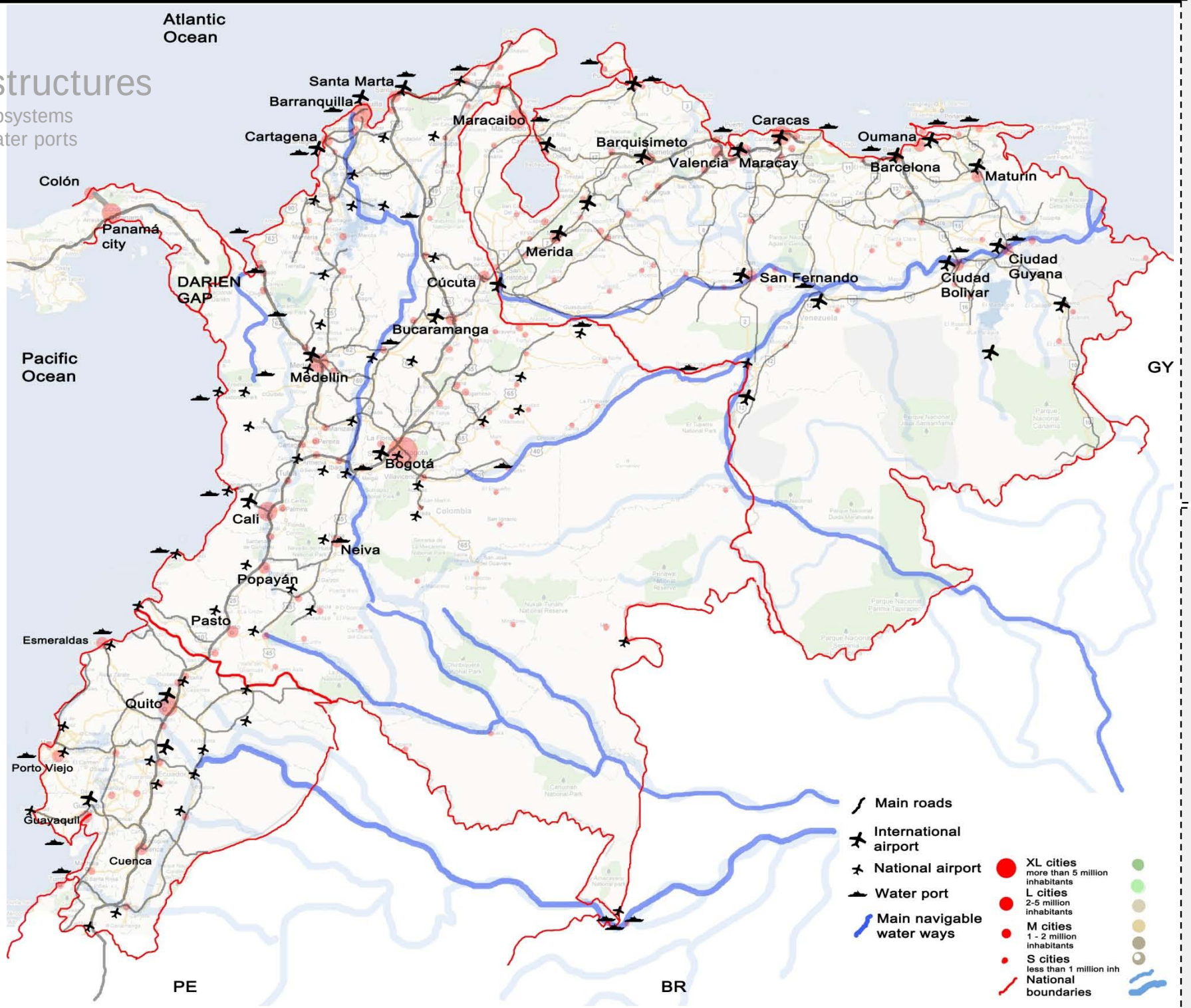
NORTHERN ANDEAN CITY

TERRITORIES

+ Infrastructures

Layers/Subsystems

Air and Water ports



LOMBARDIA - TICINO CITY

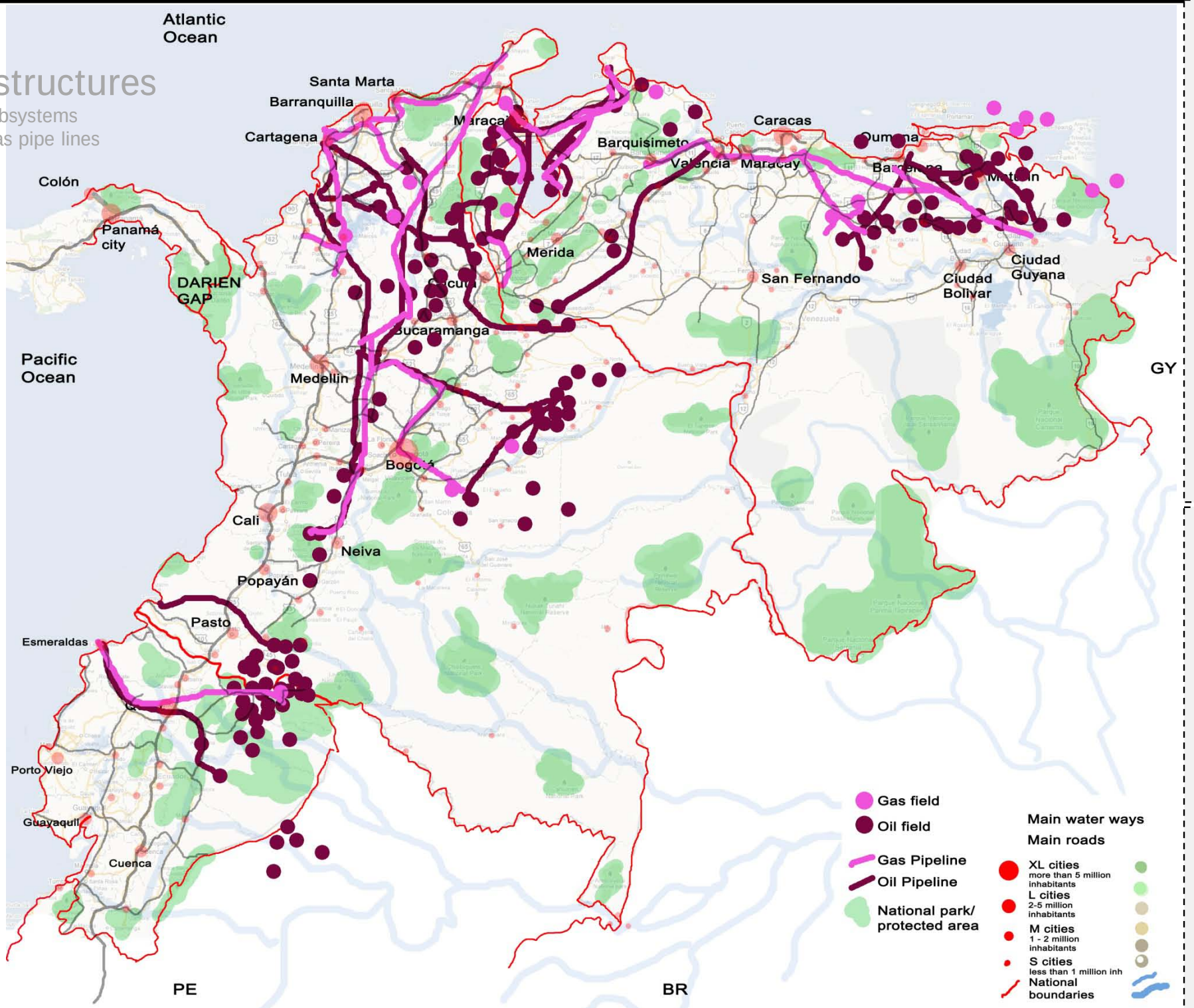
NORTHERN ANDEAN CITY

TERRITORIES

+ Infrastructures

Layers/Subsystems

Oil and Gas pipe lines



LOMBARDIA - TICINO CITY

NORTHERN ANDEAN CITY

TERRITORIES

+ Infrastructures

Panamerican Highway

The **Autopista Panamericana** is a network of roads measuring about 47,958 kilometers in total length. It is infact considered the world's longest "motorable road". Except for an 87 kilometers (54 mi) rainforest break, called the **Darién Gap,** the road links the mainland nations of the Americas in a connected highway system. However it is considered a system, even though because of the Darién Gap it is not possible to cross between South America and Central America by traditional motor vehicle, but by shipping from several Colombian cities of the Caribbean cost. The idea of the Pan-American Highway emerged at the Fifth *International Conference of American States* in 1923, where it was originally conceived as a single route. The Pan-American Highway system extends from Prudhoe Bay, Alaska, in North America to the lower reaches of South America. Several highway termini are claimed to exist, including the cities of Puerto Montt and Quellón in Chile and Ushuaia in Argentina. No comprehensive route is officially defined in Canada and the United States, though several highways in the U.S. are called "Pan-American".

Many people, groups, indigenous populations, and governments are opposed to completing the Darién portion of the highway. Reasons for opposition include protecting the rain forest, containing the spread of tropical diseases, protecting the livelihood of indigenous peoples in the area, and preventing drug trafficking and its associated violence from emanating out of Colombia. The extension of the highway as far as Yaviza resulted in severe deforestation alongside the highway route within a decade. One option proposed, is a short ferry link from Colombia to a new ferry port in Panama, with an extension of the existing Panama highway that would complete the highway without violating these environmental concerns. The ferry would cross the Gulf of Urabá from Turbo, Colombia, to a new Panamanian port (possibly Carreto) connected to a Caribbean coast extension of the highway. Efficient routing would probably dictate that the existing route to Yaviza be relegated to secondary road status

"... is a system so vast, so incomplete, and so incomprehensible it is not so much a road as it is the idea of ***Pan-Americanism*** *itself..."*
Jake Silverstein, 2006

CONDEMN TO THE LARGEST MASSACRE OF ALL TIMES IN NORTHERN ANDEAN TERRITORY:

THE RAILWAY DEATH

EFE news
Colombia and Venezuela talk about to build railroad together
July 5th, 2008 ·
Colombian President Álvaro Uribe accepted the proposal of his Venezuelan counterpart Hugo Chávez to build railroad between Colombia and Venezuela to transport cargo and passengers between the two countries.
Uribe proposed the construction of two lines. One from Venezuela through Colombia's eastern plains to finish in Ecuador, the other to the Caribbean coast.
Uribe said that he would sign his commitment when meeting Chávez on July 11 in Caracas and intents to try to start the construction of the railway this year.

+ Infrastructures

Railway panorama and new devices

Since the first production of cars by Ford in the USA in the beginning of the last century and the construction of the first highways system, the north American cultural power centered the attention of the entire world in the production of roadways all over the countries as a symbol of civilization and development, and placed the fact of possessing a private car as the concretization of the individual success. Therefore, the world had to modify the look over the way people mobilize and transport goods.

The economical and political – and geographical - closeness of Latin America to the USA, have made a huge effect on the life style and cultural development of new born states of the beginning of the XX century. This effects where probably even stronger for the rural society of the second half of this century in Latin America, where the economies started to industrialize and open their markets. This influences – or pressures - have been made politically open and its even visible in the urban morphologies than can be observed today, how the patterns of urbanization changed in a certain time, and there is an specific way that the main urban centers have developed their urbanities and infrastructures after the 50's and 60's.

The railways in South America in general had a common history, since the first developments in the early XX century, and seem to have a common fate: they have been suffering since some decades ago a complete lack of investment from the states, who have center the attention and the major investments off course, on the construction of large and complex systems of road and highways, all through out the hard geographies of the andean mountains, virgin rainforest and coasts, connecting with this systems the main urban centers, then converted in main metropolitan nodes. During the decades of the 70's and 80's, the governments of Latin America – same as most of the third world countries and others going through late industrializations - invested their best budgets in the road transport as the main way for goods and persons to mobilize over the territory.

Unfortunately, the investments made on the construction of the highway systems and road ways in general, lead to a sometimes even the absolute abandon of the railways that were constructed before in the last decades of the XIX century by European companies and professionals that traveled to the Americas to complete the works following the trends of the Old Continent as the high society fashion dictated in the times.

Rank	Country	Railway length (km)	Date of information
1	United States	226,427	(2007)
2	Russia	128,000	(2006)
3	People's Republic of China	86,000	(2009)
4	India	63,327	(2007)
5	Canada	57,216	(2007)
6	Germany	41,896	(2008)
7	Australia	38,550	(2006)
8	Argentina	35,897	(2007)
9	France	29,901	(2008)
10	Brazil	29,817	(2008)
11	Mexico	26,704	(2009)
12	South Africa	24,487	(2007)
13	Japan	23,474	(2007)
14	Ukraine	21,676	(2008)
15	Poland	19,627	(2008)
16	Italy	16,862	(2008)
17	United Kingdom	16,321	(2008)
18	Spain	15,064	(2008)
19	Kazakhstan	14,205	(2008)
20	Romania	10,784	(2008)
29	Chile	5,898	(2006)
34	Cuba	5,076	(2007)
53	Uruguay	2,993	(2006)
54	Netherlands	2,896	(2008)
55	Bolivia	2,866	(2007)
56	Portugal	2,842	(2008)
70	Peru	2,020	(2008)
76	Colombia	1,663	(2007)
87	Ecuador	966	(2006)
92	Guatemala	885	(2004)
104	Honduras	699	(2006)
113	El Salvador	562	(2007)
114	Dominican Republic	517	(2006)
120	Panama	355	(2006)
121	Venezuela	336	(2006)
124	Costa Rica	278	(2007)
134	Puerto Rico (US)	96	(2006)
141	Paraguay	36	(2006)
	World	1,370,782	(2006)

List of the countries of the world and their railways, by length, in color South American nations. CIA database

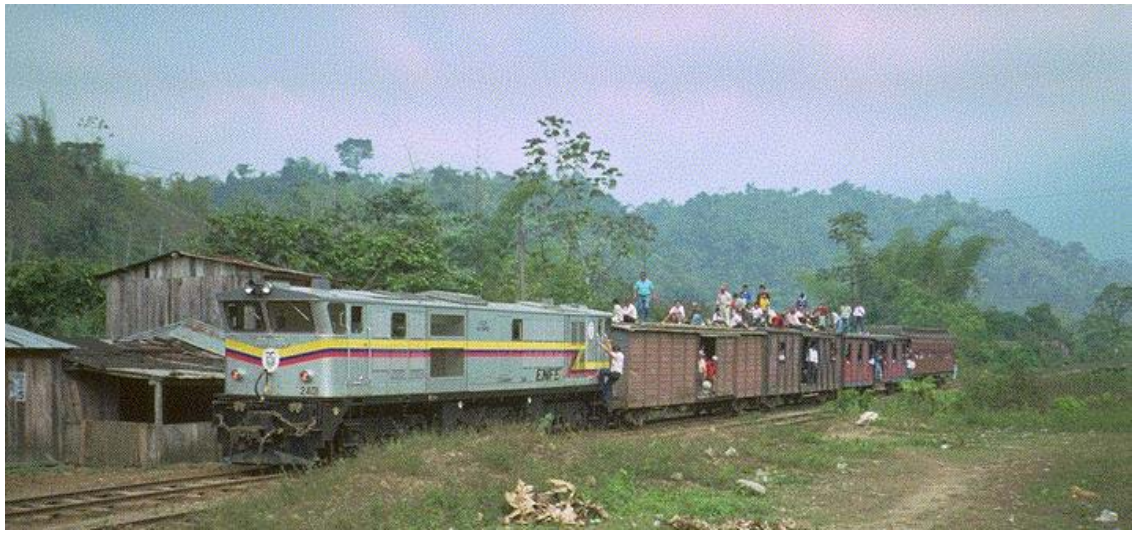
+ Infrastructures

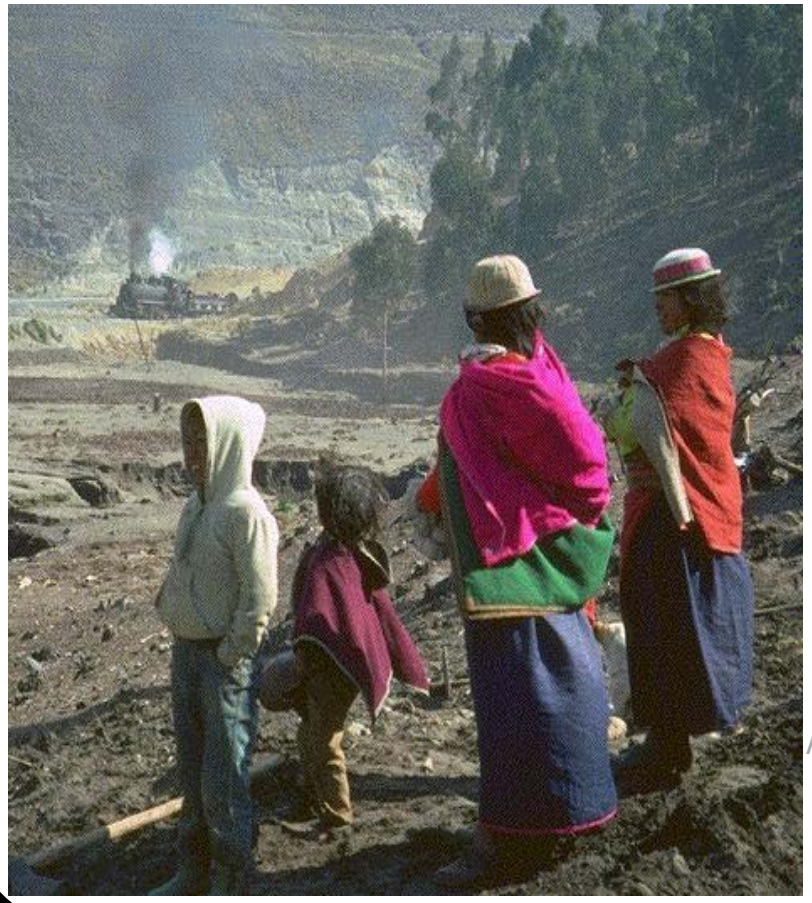
Railway panorama and new devices

Ecuador's Railways:

total: 965 km
narrow gauge: 965 km 1.067-m gauge (2008)

The railways of Ecuador consisted of a total of three lines:
From the harbour city of Guayaquil originally a bridge should have been built across the bay to Durán, but this has not yet been realised. Therefore the goods were transferred by ferries to Durán where they were loaded into railway goods wagons. At Durán can be found workshops, and there the railway line to Quito starts. The first line, with a length of 447 Km, the basic line, called south line, goes from Durán as a lowland section via Yaguachi and Milagro to Bucay where the main workshops can be found. There the mountain section starts with an inclination of up to 55%o, via Huigra, Sibambe - Alausi and Palmira - Riobamba (2753m above sea level). From there, the line reaches the culmination point of the line, 3609m above sea level, and goes via Ambato and Latacunga to Quito (2817m above sea level). A branch line with a length of 145 km goes from Sibambe via Azogues to Cuenca. Construction started in 1915, and the line opened in 1965. There were many private sidings with tracks of 600 mm and 1067 mm gauge, among others to the sugar factory Ingeniero San Sarli and to the plantations of the Empresa de Carros Urbanos. The third line, called North Line, with a length of 373 kilometre, goes from Quito via Ibarra, Primer Paso and Cachavi to San Lorenzo where the sea is reached, and was finished only in 1957. There where projects of connection with Colombian railway in this region, but where never accomplished.
On the line to Cuenca which mostly served for goods transports, service stopped already in the early nineties. On the other lines there was regular goods and passenger operation until 1998. The then El Ninõ tempest disrupted the remaining lines, and from then on trains operated only on partial lines. Since 2005 a project of the re-establishment of the lines is underway. Thanks to credits from Venezuela work has now started on the rebuilding of the line between Durán and Bucay where also concrete sleepers are used. Further projects concern a bridge between Guayaquil and Durán and a bypass line at Durán.





NEWS / NOTICIAS EFE (1/2008)

The aim is to reopen rail services between Quito and Guayaquil in June. In the view of the Centenary celebrations of Railways in Ecuador, in June 2008, state rail operator EFE is making some investments into the rail network. As announced in 2007 by EFE's president Jesús Loya, 28 million€ will be invested in the rehabilitation of the railway. Part of the work will be destined to rehabilitate stretches of the line in Chimborazo province; furthermore investments have been made into rehabilitation of operational diesel-electric locomotives and two steam locomotives.

With the help of a tourist enterprise it was possible to get sleepers for rehabilitation and regular maintenance of the line and two contracts have been made with the municipalities of Tambo and Azogues for rehabilitation of their respective stations and another one about professional education of railway staff. Further contracts are pending with the Central Bank of Ecuador about rehabilitation of more stations and the development of competitivity and technical assistance.

EFE got some funds through renting out of some of its ownings, which put the railway in a better economic position, also against the government that this may help the rehabilitate the railway system. Priority is the rehabilitation of the railway of Alfaro, which may be until next June, when train service should reassume between Quito and Guayaquil, at the moment of the Centenary of the railway in Ecuador.

+ Infrastructures

Railway panorama and new devices

Venezuela's Railways:
total: 806 km
standard gauge: 806 km 1.435-m gauge (2008)

Much of the original Venezuelan network was designed in the 19th century, in order to open up the country for trade and earn foreign revenues. However, the first licenses were signed and revoked nine times before the first stretch was operating. The first lines connected Caracas to its port of La Guaira and then Valencia in the 1870s–80s. Rail transport in Venezuela was neglected and went into a major decline from the 1950s, with bus and road transport taking its place, just Caracas maintaining its 51 km (32 mi) of subway system and local railway. The 1999 Constitution was a signal for a major reinvestment in the infrastructure of the state. Much of the renovation of the current Venezuelan railway network is still at the planning stage, with some already constructed and the rest to be built over a period of about 30 years.

IAFE is the sole operator of trains in Venezuela, however, they have created various railway names assigned to different regions throughout the country. **IAFE**, *Instituto Autónomo de Ferrocariles del Estado* is a state-run organization that manages the railway systems of the country. Its headquarters are located in Caracas. According to the 1999 Constitution its renovation is a national priority, with new infrastructure being added, including the first new above-ground train line constructed in Venezuela for more than 70 years, the *Ezequiel Zamora Mass Transportation System* inaugurated in 2006.

+ Infrastructures

Railway panorama and new devices

Colombia's Railways:

total: 3,802 km
standard gauge: 150 km 1.435-m gauge
narrow gauge: 3,652 km 0.914-m gauge (2008)

During the late 19th century European and American companies introduced railways to carry to the ports the local production of raw materials intended for exports and also imports from Europe. Steam ships began carrying Colombians, immigrants and goods from Europe and the United States over the Magdalena River. The Ministry of Transport was created in 1905.
For 2010, rail transport in Colombia remains **underdeveloped**, only 2,611 kilometers of lines are in use. The national railroad system, once the country's main mode of transport for freight, has been neglected in favor of road development and now accounts for only about a quarter of freight transport. Passenger-rail use was suspended in 1992 and resumed at the end of the 90s. However, fewer than 165,000 passenger journeys were made in 1999, as compared with more than 5 million in 1972, and the figure was only 160,130 in 2005.
Short sections of railroad, mainly the Bogotá-Atlantic rim, are used to haul goods, mostly coal, to the Caribbean and Pacific ports. In 2005 a total of 27.5 million metric tons of cargo were transported by rail. Although the nation's rail network links seven of the country's 10 major cities, very little of it has been used regularly because of security concerns, lack of maintenance, and the power of the road transport union. During 2004–6, approximately 2,000 kilometers of the country's rail lines underwent refurbishment. This upgrade involved two main projects: the 1,484-kilometer line linking Bogotá to the Caribbean Coast and the 499-kilometer Pacific coastal network that links the industrial city of Cali and the surrounding coffee-growing region to the port of Buenaventura.

Railroads in Colombia were constructed with the purpose to connect productive regions with the Magdalena River,26 and then with seaports. For this reason, railroads were a complementary system to fluvial transportation rather than a substitute. Indeed, railroads were mainly a substitute to the costly earlier land transportation, say mules, human porters and animal drawn carts.

"The coffee history is closely related with the railroad history. Without coffee, railroads would not have been economically feasible, and coffee would not have been expanded without railroads."
Urrutia M, 1980

+ Infrastructures

Railway panorama and new devices

Road travel is the main mean to transport people and freightin Colombia: almost 70 percent of cargo is transported by road, as compared with 27 percent by railroad, 3 percent by internal waterways, and 1 percent by air. Nevertheless, Colombia has one of the lowest ratios of paved roads per inhabitant in Latin America. The country has well-developed air and waterway routes. The only means of transportation in 60 percent of the country is via waterways, but guerrilla groups control the waterways in the south and southeast.

In the early 20th century roads and highways maintenance and construction regulations were established. Rivers were cleaned, dragged and channeled and the navigational industry was organized. The Public works districts were created, as well as the **Ferrocarriles Nacionales de Colombia** (National Railways of Colombia). Among other major projects developed were the aqueduct of Bogotá, La Regadera Dam and the Vitelma Water Treatment Plant. The Ministry also created the National Institute of Transit (from the Spanish *Instituto Nacional de Tránsito*), (INTRA) under the Transport and tariffs Directorate and was in charge of designing the first National roads plan with the support of many foreign multinational construction companies.

Seaports handle today around 80 percent of international cargo. Colombia's most important ocean terminals are Barranquilla, Cartagena, and Santa Marta on the Caribbean Coast and Buenaventura and Tumaco on the Pacific Coast. Exports mostly pass through the Caribbean ports of Cartagena and Santa Marta, while 65 percent of imports arrive at the port of Buenaventura. Other important ports and harbors are Bahía de Portete, Leticia, Puerto Bolívar, San Andrés, Santa Marta, and Turbo. Since privatization was implemented in 1993, the efficiency of port handling has increased greatly.

There are plans to construct a deep-water port at Bahía Solano

The main inland waterways total about 18,200 kilometers, 11,000 kilometers of which are navigable by riverboats. A well-developed and important form of transport for both cargo and passengers, inland waterways transport approximately 3.8 million metric tons of freight and more than 5.5 million passengers annually. Main inland waterways are the Magdalena–Cauca River system, which is navigable for 1,500 kilometers; the Atrato, which is navigable for 687 kilometers; the Orinoco system of more than five navigable rivers, which total more than 4,000 kilometers of potential navigation (mainly through Venezuela); and the Amazonas system, which has four main rivers totaling 3,000 navigable kilometers (mainly through Brazil). The government is planning an ambitious program to more fully utilize the main rivers for transport. In addition, the navy's *riverine* brigade has been patrolling waterways more aggressively in order to establish safer river transport in the more remote areas in the south and east of the country that are controlled by rebel groups.

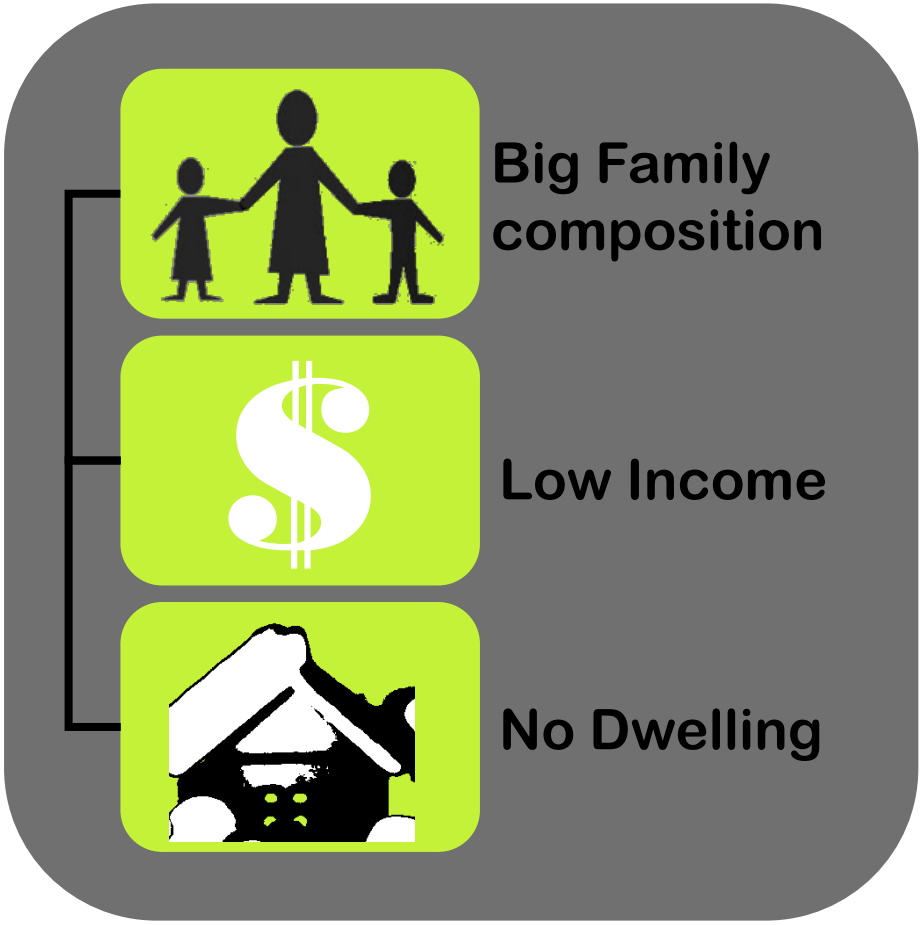
The merchant marine totals 17 ships (1,000 gross registered tons or more), including four bulk, 13 cargo, one container, one liquefied gas, and three petroleum tanker ships. Colombia also has seven ships registered in other countries (Antigua and Barbuda, two; Panama, five).

* SPECIAL FEATURE

EFFORTS FOR A SUSTAINABLE TRANSPORTATION IN COLOMBIA

+ Efforts for a sustainable transportation in Colombia

Urban settlements without regulation, are mostly based on



The development of the Colombian mobility system is seeking to meet the needs of good accessibility for people and cargo in a safe, efficient, affordable and consistent way with human health and the ecosystems.

Problematic:

Human settlements on non regulated areas of the city.

Causes:

Low income, easy appropiation of unregulated lands, what makes it a way to provide dwellling for the familes (hence new services for the new areas)

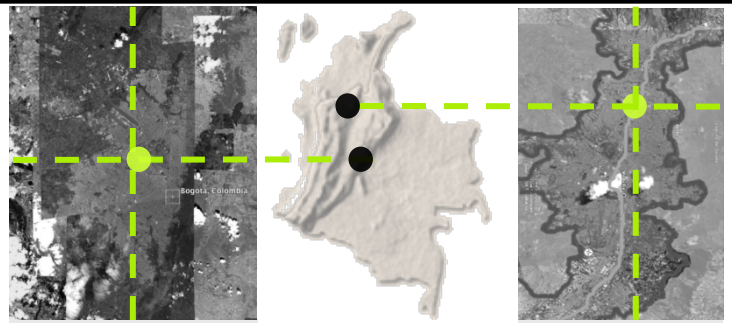
Secondary effects:

No public services like water, electricity and especially **the INEFFICIENT PUBLIC TRANSPORTATION** become one of the main priorities as well one of the most creative ones to compensate the needs.

Public transportation in most all the Colombian cities was traditionally perceived as **inefficient, unsafe and polluting.** The streets of Colombian cities were crowded with obsolete buses which operated with disregard for public safety and in near chaos, without organized bus stops.

+ Efforts for a sustainable transportation in Colombia

Integrated urban transport systems have been lately developed in major Colombian cities: Bogotá and Medellín, as part of larger urbanistic plans of re qualification and integration of the large metropolitan areas, given the growth rates of the last decades. Other cities such as Cali and Barranquilla are in process of developing their own systems.



HOW A BUS IS A METRO IN BOGOTA?

HOW MOUNTAINS ARE INTEGRATED WITH THE LANDSCAPE

+ Efforts for a sustainable transportation in Colombia

Traffic congestion in Bogotá has been greatly exacerbated by the lack of rail transport. However, this problem has been alleviated somewhat by the development of the TransMilenio Bus Rapid System and the restriction of vehicles through a daily, rotating ban on private cars depending on plate numbers. Bogotá's system consists of bus and minibus services managed by both private- and public-sector enterprises.

The mass bus transport system, known as the *Transmilenio,* launched in Bogota in 2000, commenced its second phase in November 2003 and is becoming a model for other cities in the region. In the *Transmilenio*, the principal corridors are constructed as exclusive routes for trunk lines, operating large capacity buses, and which are integrated, physically and by fare, with feeder routes, serviced by smaller vehicles bringing a series of advantages such as a better balance between bus size and transport demand; improved productivity of large vehicles separated from automobile congestion; less inconvenience for transfer passengers because of integration; an increase in transport capacity at a far lower investment cost than for railway alternatives; In 2003, Guayaquil, Lima, Santiago and other cities in Colombia decided to set up systems based on the Transmilenio.

The model's overall benefits are greater in large, densely populated cities like Bogota, and, from the user's point of view, it is not clear whether it would be appropriate to adopt it in smaller or more spread out cities, where segregated routes will bring fewer benefits and where the model's disadvantages, such as an increase in the distance of an average journey, are evident. An increase in the number of transfers diminishes Transmilenio's attraction for users, and the theoretical advantage of facilitating reduced per journey costs is not always put into practice.

The existing transport business model until the appearance of Transmilenio, favored competition in the market and a fragmentation of service providers. Bus companies in Colombia were largely informal and operated on a cash-basis; they did not pay taxes or offer social security benefits to their employees.

Several factors came together to create this situation and its resulting negative influence on the quality of life of urban Colombians, but two stand out as structural causes to explain Colombia's problems with urban transport:

-The revenue incentives for a bus company depended on the number of buses that it affiliated which translated into an over-supply of buses, mini-buses and vans in the city.

-The traditional incentives for bus drivers –and their wages—was the payment per number of boarded passengers, which generated a fierce competition across companies for passengers in the streets, creating safety risks for users and pedestrians. Furthermore, since there was a low level of enforcement in the use of bus stops, this promoted boarding and alighting along all the curbs, reducing traffic flow.

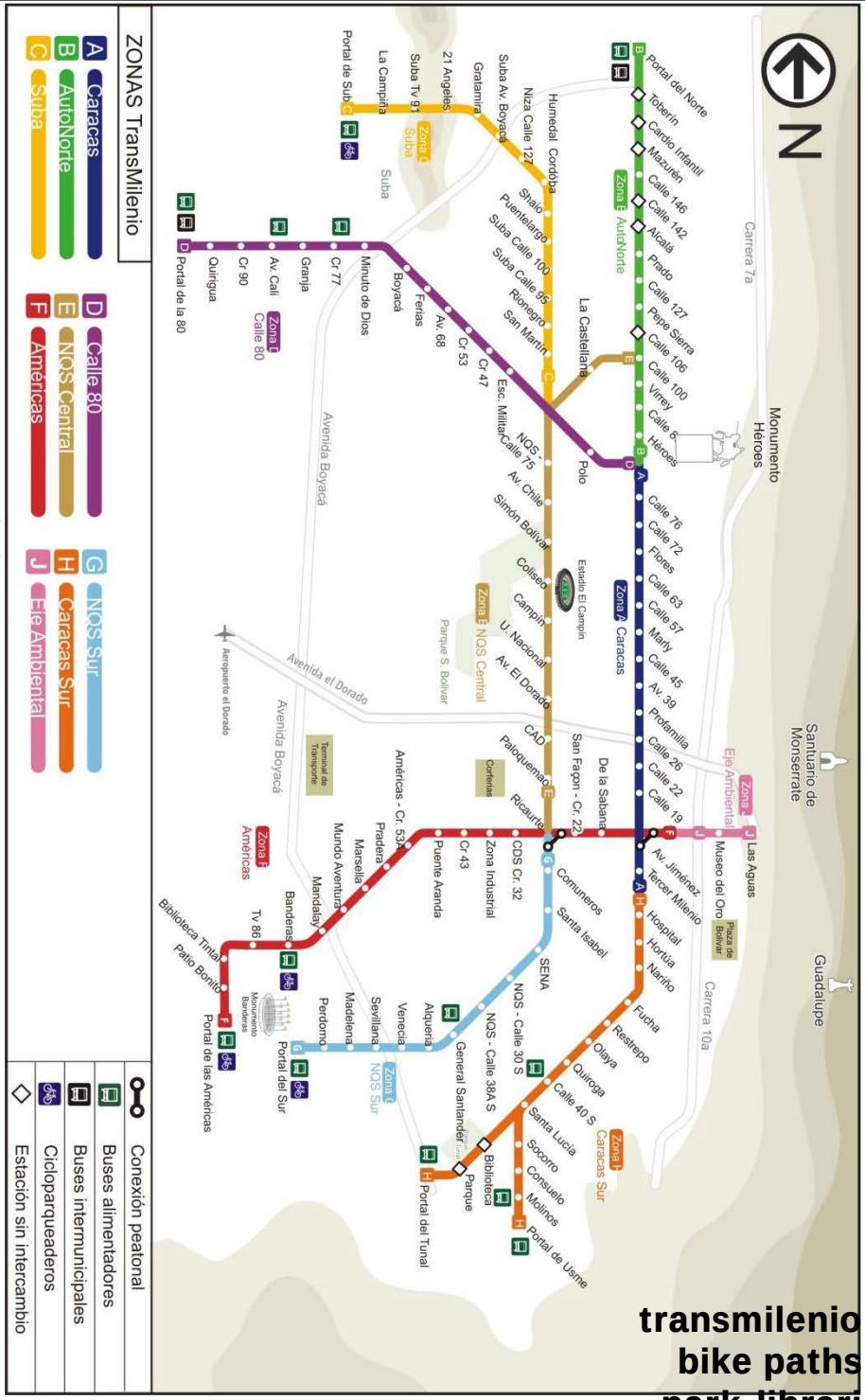
+ Efforts for a sustainable transportation in Colombia

In the past, Colombia faced urban transport problems that significantly lowered the quality of life of urban Colombians. Starting in the late 1990s, the **Programa Nacional de Transporte Urbano** helped transform Colombia's urban transport system. The approaches under this program are now considered international best practice and have been replicated by cities around the world to address their transportation challenges.

TransMilenio, on one hand consists of several interconnecting BRT lines, each composed of numerous elevated stations in the center of a main avenue, or "troncal". Passengers typically reach the stations via a bridge over the street. Usually, four lanes down the center of the street are dedicated to bus traffic. There are both express and local buses, the latter stopping at all stations. The outer lanes allow express buses to bypass buses stopped at a station, but on the other hand is interacting with he cycling and the location of large green areas that serve the purpose of education and culture, as libraries, concert spaces among others.

The Master Plan of cycle paths (PMC) is a strategy to promote the daily mobilization by cycling in the city of Bogotá, with the aim of reducing traffic congestion and achieve positive social dividends, especially economic but mostly environmental.

The 301 kms of cycle paths are connected from the north to the south of the city, giving the possibility to circulate with an alternative mode of transport with low emissions



+ Efforts for a sustainable transportation in Colombia

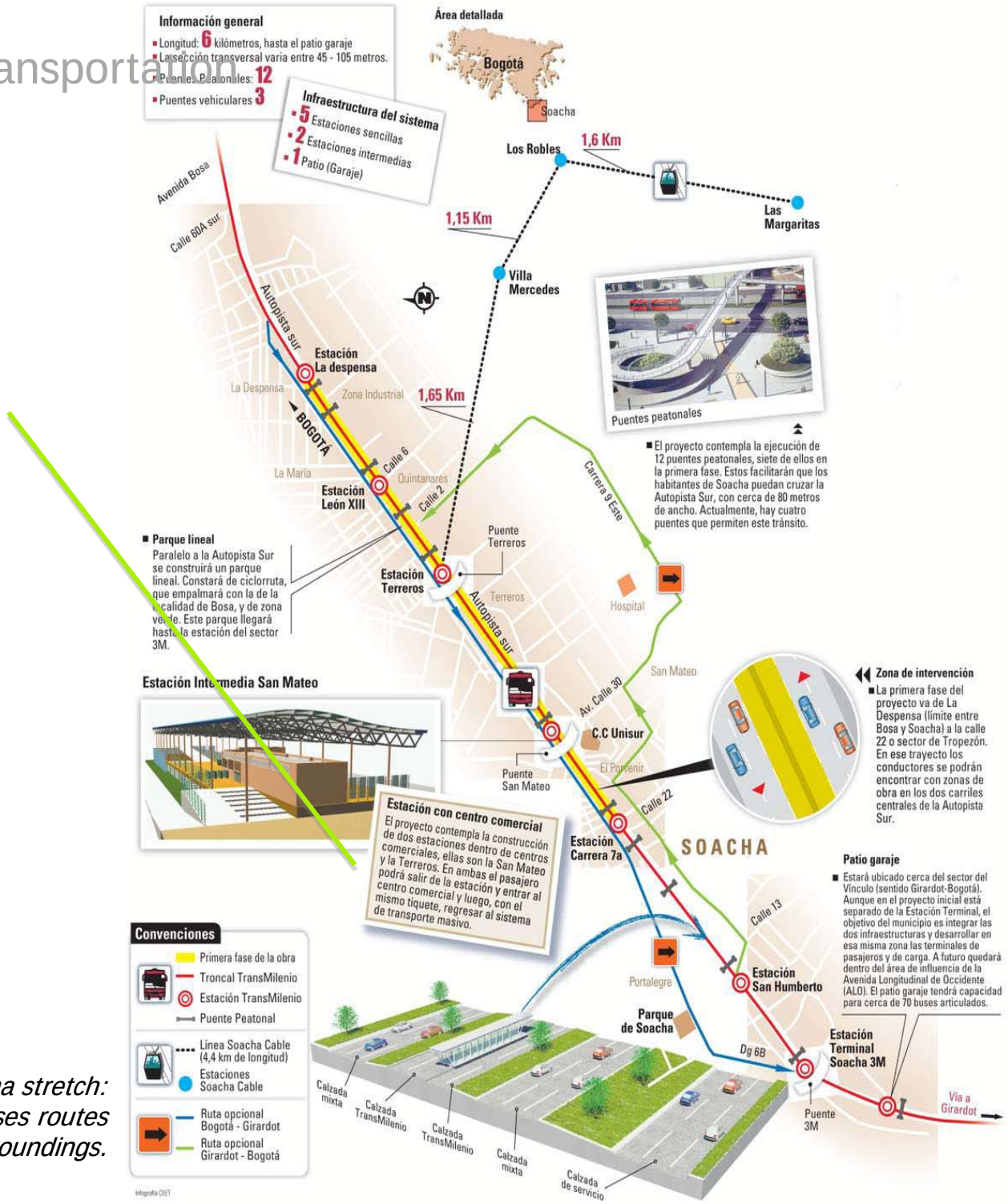
Cable car stations

Transmilenio stations, the last one is called “portal” which interacts with other services as the green buses that will collect the people from the distant places (free of charge) or the regional trains in the northern part of the city

Transmilenio interexchange station, first one to take the cable car to the upper hills of the southern sector of Bogota.

Lineal park, bike paths and outdoors activities

Axis provided with all kind of urban uses: commerce, housing, among the main services.

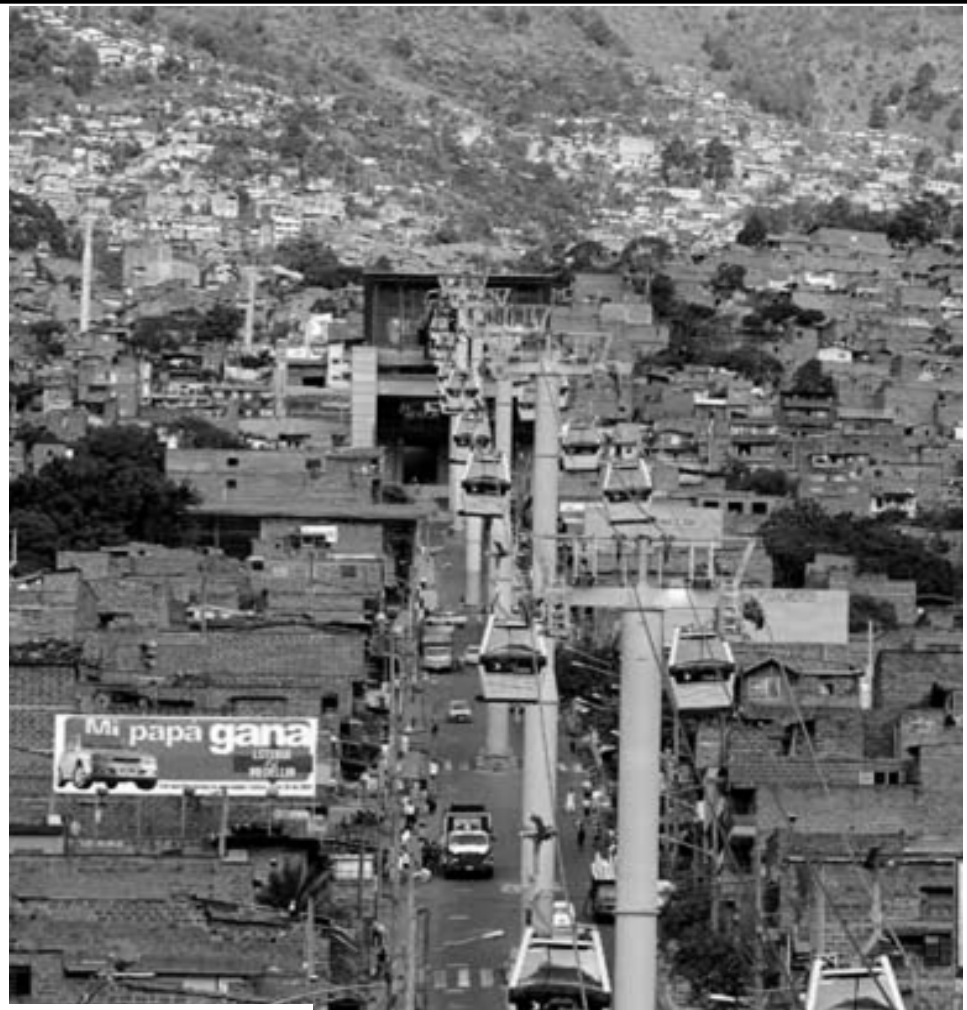


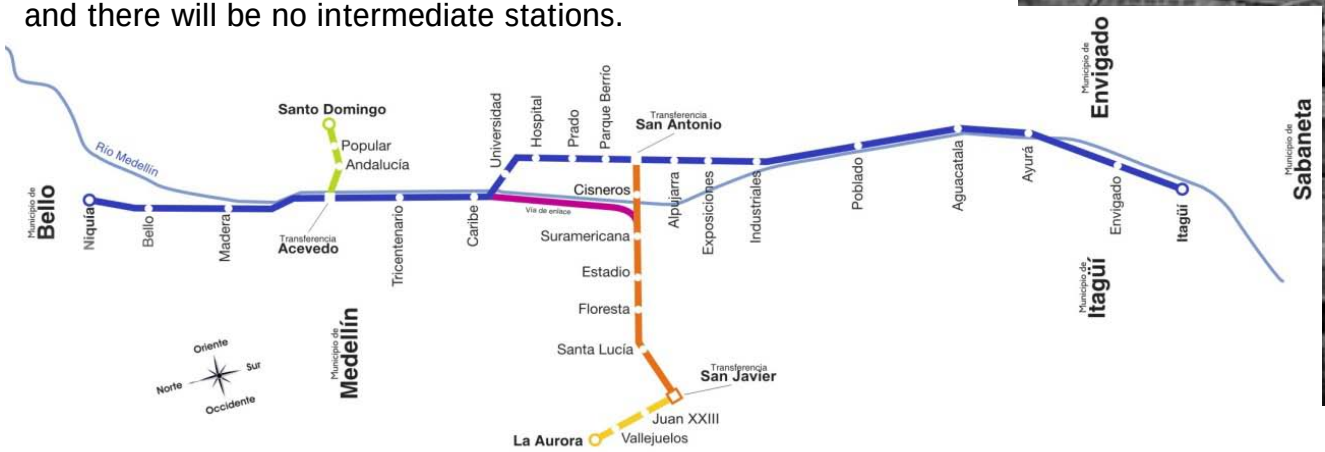
TransMilenio Soacha stretch: services linked with buses routes and its interaction with the surroundings.

+ Efforts for a sustainable transportation in Colombia

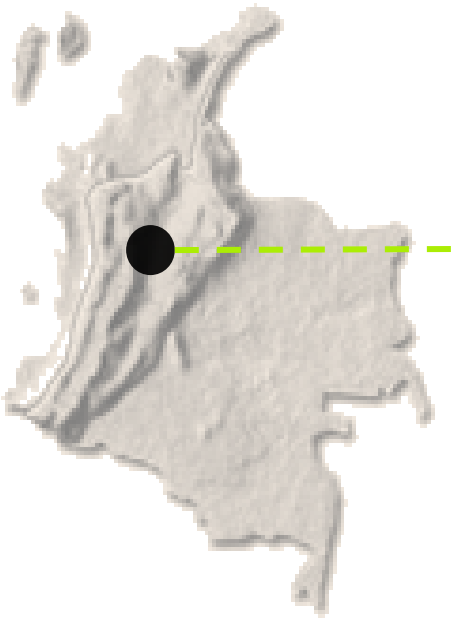
Since 1996 Medellín has had a modern urban railway referred to as the Metro de Medellín, which also connects with the cities of Itagüí, Envigado, and Bello. An elevated cable car system, Metro Cable, was added in 2004 to link some of Medellín's poorer mountainous neighborhoods with the Metro de Medellín.

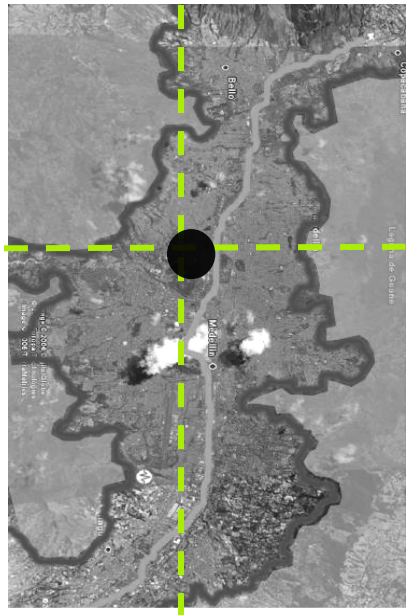
Many of the hills are home to underdeveloped areas, which due to their location cannot be reached by the Metro or other transportation services. Many of these barrios are in fact located in very steep grounds to the extent that not even a regular bus system could be either useful or commercially profitable. The system consists of cable cars connected to a fixed cable through means of a grip. The cabins move at an average speed of 10 miles per hour (16 km/h). At the present time two lines have been built, the line J and line K. These lines currently serve the districts of Andalucia (K), Popular (K), Santo Domingo Savio (K), Juan XXIII (J), Vallejuelos (J) and La Aurora (J). The system has been received with enthusiasm by the locals. It is also expected that the new S line will help promote and develop tourism in the rural areas around Lake Guarne. It will take 14 minutes to ascend to El Tambo and there will be no intermediate stations.



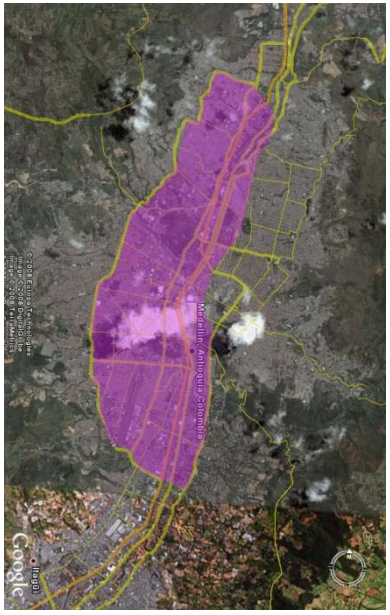


+ Efforts for a sustainable transportation in Colombia





BOUNDARIES



FLAT CITY

MOUNTAIN POPULATED AREAS

TARGET:

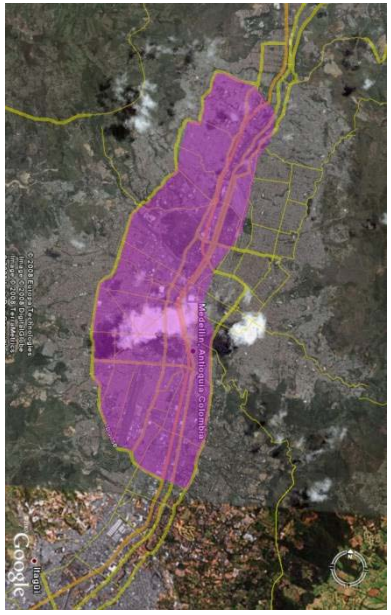
[redacted]

MEDELLIN

Among the main features of the Medellin Master Plan were **the canalization of the Medellín River**, the control of new settlements on valley slopes, the creation of an industrial zone in the Guayabal District, the planning of the city to be in harmony with the river, the construction of a city stadium, and an administrative center in La Alpujarra.

However, being the second largest city in Colombia generated a large population explosion and had several consequences. The urban limits of the city grew to areas that were not contemplated in the MMP, so that Medellín now reached the urban areas of other cities of the Aburrá Valley, like Envigado, Bello and Itagüí; the new Medellín settlers were poor families without enough credit to buy their own homes, so several neighborhoods were built beyond the MMP espcially in the mountains.

+ Efforts for a sustainable transportation in Colombia



FLAT CITY

MOUNTAIN POPULATED AREAS

How to establish a connection between the lower part of the Aburrá valley and the higher part of the mountains?

Metrocable was the implemented solution with the purpose of providing a complementary transportation service to Medellin's Metro. It was designed to reach some of the least developed suburban areas of the city.

MEDELLIN

TERRITORIES

+ Efforts for a sustainable transportation in Colombia

Bogotá and Medellín are constantly looking for:

+ The search of social integration points through the balance of mobility and access opportunities in physical, economic, information and improving the quality of life and the urban environment.

+ Planning and creating a society with less needs of mobilization based on carbon emissions, improving the capacities and the influences of the featured demands.

+ The concept of INTEGRATED TRANSPORTATION IN BOGOTA, is not only the association of the whole system of buses and transmilenio, but goes beyond that, is a matter of linking pedestrian networks, cycle paths, the network of buses and taxis, mass transit networks (transmilenio, metro), the private transport main ecological structure (network of parks), including specifications for persons with disabilities and the public libraries in the most depressed areas of the city.

A bus rapid-transit system called TransMetro, similar to Bogotá's TransMilenio, will begin operating in Barranquilla in 2009. Cali's streets remain under construction as a new public-transit system called the Massive Integration of the West is being built.

"peak and plaque" policy:

Depending on the last number of the plaque, every car of the city has 2 days of the week in which it can not "roll" the main streets, at any time.

The peak and plate policy is a vehicle restriction program first implemented in Bogota during the first mandate of the mayor Antanas Mockus and later in other cities of Colombia and Venezuela. In the first days of January 2010, announced the implementation of this measure in the city of Quito in Ecuador due to congestion that occurs in the city.

This traffic rule imposes a mandatory movement restrictions in urban areas to private cars and public service in times of "peak" (times with more traffic flow), depending on the last car number plate, trying to reduce her collapse circulatory formed at these times. Within your application each year is rotated on restriction for the number plate of the vehicle.

This has forced many inhabitants of the city looking for new ways of transportation both public transport and alternative transport such as bicycles. Other corporations have devised to provide services that meet the public, as is the car rental for a day

“The Car Free Day” policy

A Car Free Day has as main purpose for motorists to give up their car for a day. Organized events are held in a lot of worldwide massive cities. According to The Washington Post, the event "promotes improvement of mass transit, cycling and walking, and the development of communities where jobs are closer to home and where shopping is within walking distance”.

In Bogotá, Data is presented in type B ultraviolet radiation affect human health, causing damage mainly in the skin and eyes on prolonged exposure, the radiation level was low. Also takes the relationship in the reduction of CO2 greenhouse gas generation.

Studies of 2009 showed a decrease of 45% over a typical day and an increase of 8% compared to the day of the year 2007.
The record of this pollutant shows the effect of the absence of private vehicles and maintained its downward trend according to records obtained from 5 in the morning. The value is very similar to that reported in Car Free Day 2007.

A day when you should love your bike,
only public transportation is allowed to be on the streets

DIMINISH THE CO2 EMISSIONS

4. THEOREM: MODEL

+ Panorama
  + New identities and new world order
  + South America's place in the world today

+ Mega projects towards development.

+ Direct relation between Infrastructure and Sustainable Development

+ About importing a settlement model

+ Polycentrism in the Northern Andean territory.

What's going on with the frontiers this days?

Is it possible to change the -apparent- fatal destination of third world countries and Latin American settlements?

Does it make any sense to import a model of settlement?

Can we learn from urban dynamics geographically distant, or at least feedback in territorial realities???

There are many models of cities in the world. They all respond to a determinate set of "coincidences'" of historical, economical, social character, that made the city to have the form it has – including in form also all the non physical elements that conform the urban sphere – and including also the people responsible for the city's health: urban planners, local and national governments, politicians, public and private associations, organized communities, just to name a few. So, as a source of knowledge and direct information about reality, territories and specially cities, follow certain paths of behavior (development).
This are the ones that have to be studied in a scientific way, in order to approach to what **IS**, so **WILL BE** doesn't catch us by surprise.
Communication technologies, and other types of mobilities, have taken us very far in the research of the urban sciences, but still, the human's capacity to understand the environment is the same old limited one, the one that can not divide it self in time and space, and can not take more than one matter at the time. The law of the big fish, eating the small fish is still the rule, and also applies to human settlements. The big – advanced cities research and decide for the rest what's the best to do, and "the rest" follows the rules.
For the small settlements, who might not want to follow the big rules, the only way is to stick together, and off course, **turn into networks.**

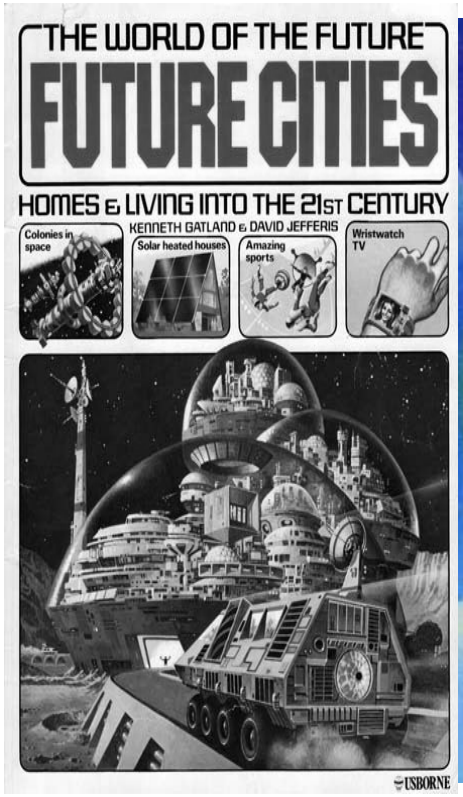
+ Panorama

New identities and world order

Its common to hear today that time is going faster this days, and its becoming a reality more than exaggeration because of the technological advances made specially in telecommunications and mobility infrastructures, but without leaving behind the medical advances that give a new meaning to human life and time.
The artificial world seems to change on a daily basis, and even quotidian objects that before where made to last forever, now are obsolete quicker than their own life time. **Contemporaneity** is then understood as a complete mess, a *catalyst* and *cataclysm* of all the possible *eclecticism*, brought together by the always growing population.
So, it is not a shock either to hear that the problems of the new era, still starting in 2010, are as urban as societies all over the globe, where for the running year more than **60% of population lives in urban areas**. This fact can not be taken lightly, because a real over population of “cities” as they are conceived now, would lead to an absolute **unbalance** , in food provisions as to name the most obvious of all.
Climate and political changes have made visible also other problems in life style and models of the actual era civilization, that hopefully and not only, will create a communitarian conscience of the communitarian sustainability troubles.
Sustainability had been roaming around for a while in academic circles, but became a popular speech after **the mass media coverage of 11-09-01 woke everyone up,** and regular – specially American – citizens started thinking that what seemed real, could not be and maybe there are limitations in life, specially if one wants to change something.

It’s the future now, and it someone wants to make us believe that everything has been already said and invented, but there are still lots of problems to resolve and adjust in all this inventions in which we live in...

Blade Runner, 1982, Ridley Scott
Traffic is taken to the sky in this filthy, rainy, and dark Los Angles of 2019.



The Jetsons 2062, Hanna-Barbera, 1962
The future city where traffic congestion is moved to the sky.

+ Panorama

New identities and world order

In 1989, the **Berlin wall** was finally demolish and that marked the end of the cold war. After this, the world opened the window of the new configurations and the European Union as we know it today, emerged with force, given the fact that before it was still “just a dream”.

Twenty years later, when there are no walls anymore and the capitalist vs. communism is not the main division of the society, many dare to maintain that nations and administrative boundaries do not **“exist”** anymore in the whole world, starting by the EU. For many, even the names of the countries are tending to disappear and the world will turn into a commercial zone divided territory, in where multinational companies own or have commercial rights over determinate “territorial targets”. In this order of things, communities would be nothing but potential buyers, landscape will be an excuse for advertising, the cities will be giant commercial centres in where to buy, and the personal identities defined by the branding.

The crisis of the nations and the traditional boundaries order, made obvious that the new dynamics created out of human control require new power orders and directions. It is visible even when the most powerful nations get together to “*tackle against global problems”* and in the last reunions it has been widely recognized as “not very effective”, in other words: useless. At this point it isn’t far from the truth to say that the G8 has lost its monopoly as a forum for wrestling with global economic problems.

With no headquarters, budget or permanent staff, ***the Group of Eight*** *is an informal but exclusive body whose members set out to tackle global challenges through discussion and action.*

G8 + 5

Canada, France, Germany, Italy, Japan, Russia, United Kingdom and United States

plus the heads of government of the five leading emerging economies : Brazil, China, India, Mexico and South Africa

The G8's roots lie in the oil crisis and global economic recession of the early 1970s. Leaders of G8 countries aim to boost cooperation over trade and finance, strengthen the global economy, promote peace and democracy and prevent-resolve conflicts. In the last reunions the main concerns have been oil and food prices and inflationary pressures. Critics of the G8 have accused the body of representing the interests of an elite group of industrialized nations, to the detriment of the needs of the wider world. During the 27th Summit in Genoa - Italy in 2001, there were violent strikes and protest against globalization and political indifference, and since then the reunions have been made in isolated places, not popular urban centers. In the summit of 2005 in UK, the G8+5 was officially formed, invited specially by when Tony Blair, then Prime Minister of the United Kingdom, that stated there was no reason for the new “powers” not to take place in such important matters.

REDRAWING THE MAP, A TREND AND A NEED

1. New Hansa
Denmark, Finland, Germany, Netherlands, Norway, Sweden

2. The Border Areas
Belgium, Czech Republic, Estonia, Hungary, Iceland, Ireland, Latvia, Litl
Romania, Slovakia, U.K.

3. Olive Republics
Bulgaria, Croatia, Greece, Italy, Kosovo, Macedonia, Montenegro, Portu

4. City-States
London, Paris, Singapore, Tel Aviv

5. North American Alliance
Canada, United States

6. Liberalistas
Chile, Colombia, Costa Rica, Mexico, Peru

7. Bolivarian Republics
Argentina, Bolivia, Cuba, Ecuador, Nicaragua, Venezuela

8. Stand-Alones
Brazil, France, Greater India, Japan, South Korea, Switzerland

9. Russian Empire
Armenia, Belarus, Moldova, Russian Federation, Ukraine

10. The Wild East
Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan

11. Iranistan
Bahrain, Gaza Strip, Iran, Iraq, Lebanon, Syria

12. Greater Arabia
Egypt, Jordan, Kuwait, Palestinian Territories, Saudi Arabia, United Arab Emira

13. The New Ottomans
Turkey, Turkmenistan, Uzbekistan

14. South African Empire
Botswana, Lesotho, Namibia, South Africa, Swaziland, Zimbabwe

15. Sub-Saharan Africa
Angola, Cameroon, Central African Republic, Congo-Kinshasa, Ethiopia, Ghana
Liberia, Malawi, Mali, Mozambique, Nigeria, Senegal, Sierra Leone, Sudan, Tan
Uganda, Zambia

16. Maghrebian Belt
Algeria, Libya, Mauritania, Morocco, Tunisia

17. Middle Kingdom
China, Hong Kong, Taiwan

18. The Rubber Belt
Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam

19. Lucky Countries
Australia, New Zealand

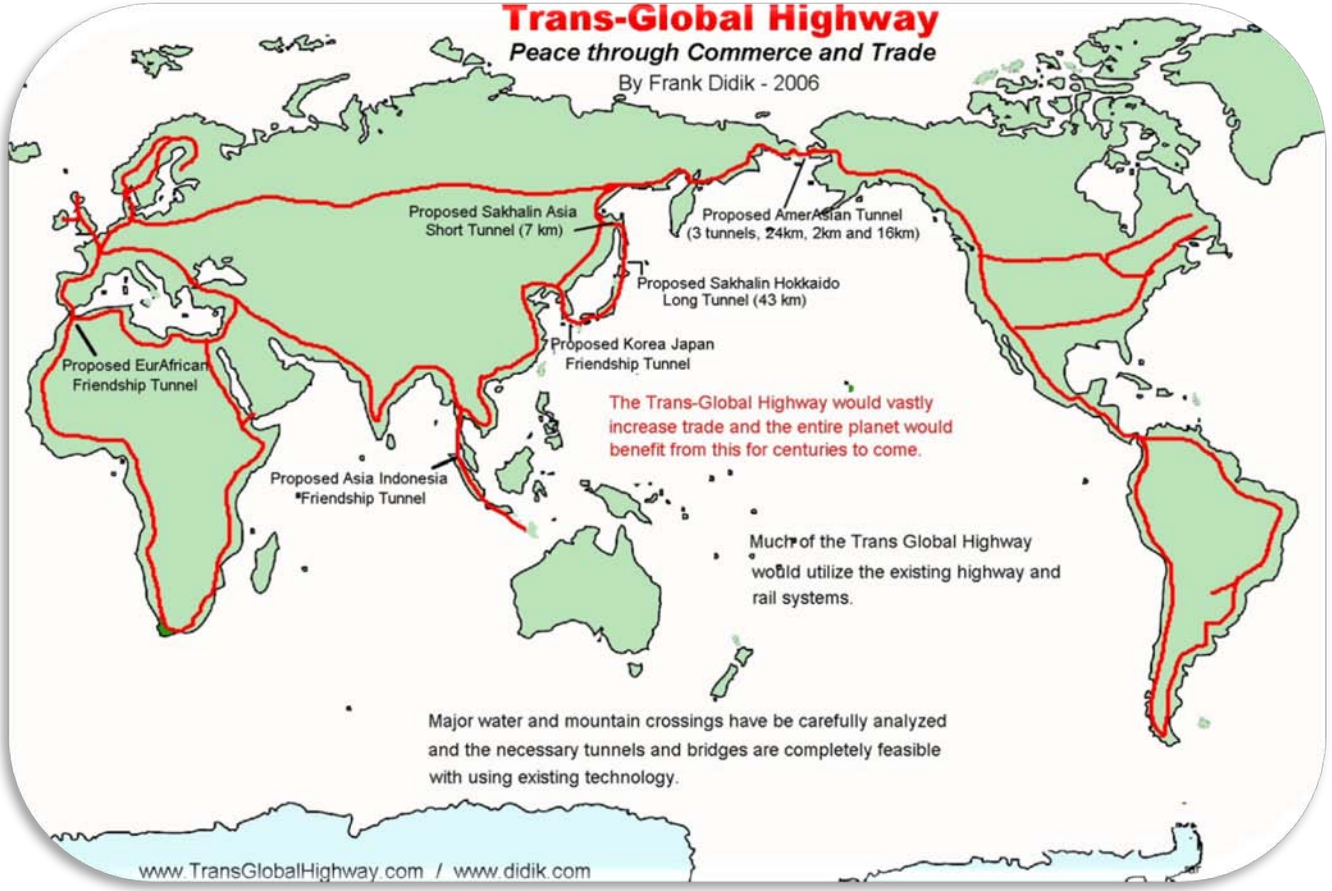
New World Order, by Joel Kotkin, 2010

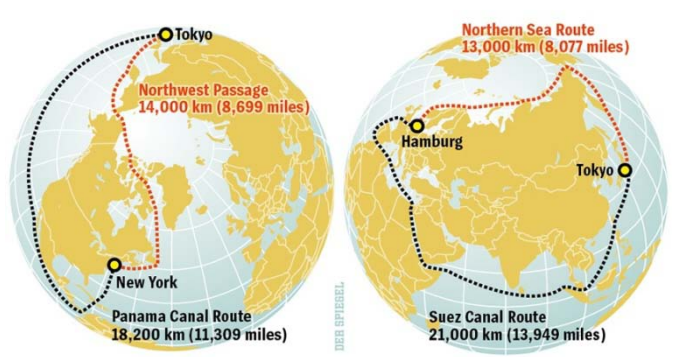
OMA/AMO atlas, worldwide, 2002

The world order is clearly changing, the old concepts do not work anymore as they use to and the pre-conceptions of the economical, and therefore social, cultural and urban, have to be reviewed. The new century for sure is bringing new dynamics and challenges.

There is a reorganization of the economical powers, and more **blocks** are being created.

It opens a whole new set of opportunities to growing societies to compete in a larger scale and to become leaders in the development of new strategies and ways of understanding the progress. It is a great opportunity and a big commitment for the governments, specially for the Latin American **ones in expansion**, to take advantage of this time and bring territories and it's potentialities to the global scenario, protecting over all the local communities but ensuring a place in the map.





"The Trans Global Highway would physically link by highways and by rail transport, all continents and major population centers, with the present exception of Australia, which, in the future, may be linked via very long suspended, pre-formed, suspended underwater tunnels from extending from the Philippine island chain"

*SPIEGEL On Line international, **09/27/2010***
Using northern routes would significantly shorten the travelling distance for shipping between Europe and Asia.

+ Panorama

New identities and world order

In the last decades, probably overwhelmed by the beginning of the XXI century, after looking at what others before thought the future was going to be, and perplex of what it is the present: in all, the good and bad, advances and returns, the main research centres have been making non stop proposals of a new future global order.

With the actual crisis of the oil prices, and the crawling of the real state American market followed by the general economic crisis of the super-power, the world seems to be going through a very important phase in which the walls are down and **the calls are open to the proposals of new orders, in some kind of international competition to suggest who should have the power from now on,** who is going up and who is going down.

It is probable that this dynamic is a normal thing in the beginning of the second decade of the century, and that's what makes it so interesting: to see that its not only the powerful ones that are proposing how the future will be like but also the new emergent economies and potential competitors in the globe order are trying to gain a place in the century of the management, communications and sustainability,

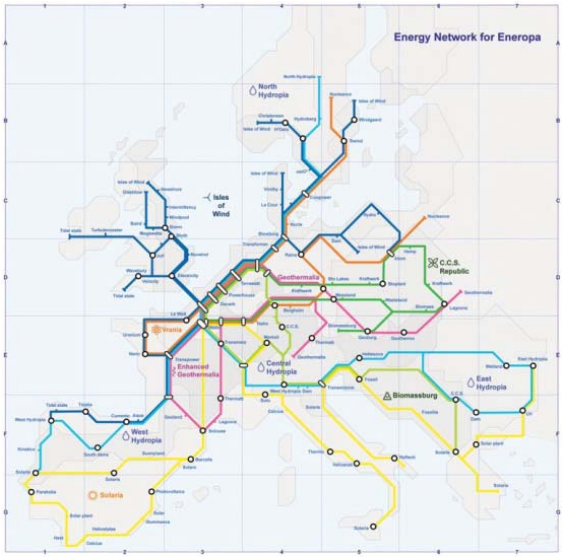
"... For centuries we have used maps to delineate borders that have been defined by politics. But it may be time to chuck many of our notions about how humanity organizes itself. Across the world a resurgence of tribal ties is creating more complex global alliances. Where once diplomacy defined borders, now history, race, ethnicity, religion, and culture are dividing humanity into dynamic new groupings. (...) The borders of this new world will remain protean, subject to change over time.

As the great Arab historian Ibn Khaldun observed:

"Only Tribes held together by a group feeling can survive in a desert."

AMO/OMA's map of Europe - 2050

In 2010, the Office for Metropolitan Architecture OMA/AMO proposed the redrawing of the map of Europe as ***Eneropa****, with countries forming new regions according to what type of energy they would supply to the grid.*



UNASUR, in full Union of South American Nations South American organization created in 2008 to propel regional integration on issues including democracy, education, energy, environment, infrastructure, and security and to eliminate social inequality and exclusion. It was inspired by and modeled after the European Union. UNASUR's members are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela. Panama and Mexico hold observer status.

UNASUR is the successor of the South American Community of Nations (**Comunidad Sudamericana de Naciones; CSN**), which was established when 12 South American leaders signed the Cuzco Declaration in the city of Cuzco, Peru, in 2004. The CSN united two trade groups—the **Andean Community** and **Mercosur,** which continued to exist in their own right—with the additions of Chile, Guyana, and Suriname. At the organization's first two annual summits (in September 2005 in Brasília, Braz., and in December 2006 at Cochabamba, Bol.), CSN leaders formulated their objectives and developed a strategic plan. At the South American Energy Summit in April 2007, they renamed the organization the **Union of South American Nations.**

On May 23, 2008, representatives of each country signed the Constitutive Treaty of the South American Union of Nations in Brasília. The treaty established a general secretariat in Quito, and a parliament in Cochabamba. It also called for an annual meeting of heads of state, a biannual meeting of foreign ministers, and a one-year rotating presidency. Chilean Pres. Michelle Bachelet served as UNASUR's first president. Within UNASUR are a South American Defense Council composed of the 12 countries' defense ministers as well as a South American Council of Health. Some of the alliance's long-term goals are to create a **continental free trade zone, a single currency, and an interoceanic highway.**

The Third Summit of South American Presidents, held in Cusco on December 8, 2004 witnessed the political creation of the South American Community of Nations, a great political project combined with a program of decentralized development. As decided by the Presidents at that meeting, the South American Community of Nations will be shaped through the gradual convergence of the Andean Community and MERCOSUR and Chile, together with Guyana and Suriname.

CAN

The Andean Community dates back to 1969, when five South American countries (Bolivia, Chile, Colombia, Ecuador and Peru) signed the Cartagena Agreement in order to jointly improve their peoples' standard of living through integration and economic and social cooperation. On October 30, 1976, Chile withdrew from it. Venezuela was a member from February 13, 1973, until April 22, 2006.

The economical model that predominated in the 70s in South America was the "import substitution" or "closed model" that protected national industry by imposing high duties on products brought into the country. The State and planning played an important role during this stage. This model entered a stage of crisis, making the eighties a lost decade for both the Andean countries and Andean integration. None of the countries in the region, from Mexico to Argentina, emerged unscathed from the debt crisis, which was reflected in the stagnation of the integration process. It was decided at a meeting held in Galapagos (Ecuador) in 1989, to replace the model of closed development with one of open development. Trade and the market became the driving forces and this was reflected in the adoption of a Strategic Design and a Working Plan in which trade occupied the leading position. The Andean countries eliminated tariffs on their trade with each other and in 1993 formed a free trade area. This gave a strong boost to trade within the Community, which increased heavily, creating thousands of new jobs. Trade in services was also liberalized, particularly the **different modes of transportation.** In 2007, the Presidents of Bolivia, Colombia, Ecuador and Peru, meeting in Bolivia, and declared that "it is necessary to develop and deepen the Andean Community integration process by taking more effective account of the visions and approaches of the Member Countries, in order to achieve unity within our diversity to serve our peoples' wellbeing and our harmony with nature. It is necessary to forge a comprehensive integration movement in which social, cultural, economic, environmental and trade aspects are in better balance". This vision is reflected in the General Secretariat's Working Plan for 2008, which provides for action in the areas of the Social and Political Area, Environment, External Relations and Economic y Trade Area.

+ Panorama

South American place in the world today

We are a Community of four countries that decided voluntarily to join together for the purpose of achieving more rapid, better balanced and more autonomous development through Andean, South American and Latin American integration.

We have planned to move ahead in deepening an **integral integration** process that will contribute effectively to sustainable and equitable human development, in order to live well, with respect for the diversity and asymmetries that agglutinate the different visions, models and approaches and that will converge in the formation of the Union of South American Nations (Unasur).

"... The South American Community will constitute a unique opportunity for the decentralized development of our countries by creating regional economies in the areas of influence of the great Integration and Development Hubs of the IIRSA program, complemented by the free trade agreement the two subregional organizations have just concluded and the harmonizing of their respective Community rules and regulations. This is a task we must undertake rapidly in order to underpin the deep integration process and our joint external projection.

Because the integration process, as a social and political project, must be highly democratic and popular, and because, in the end, it is the societies that must build those ties of understanding and unity that we seek here today, I wish to underscore the increasingly important role the Andean Parliament and our national Congresses must play in building and giving legitimacy to this new social pact in favor of development and integration, as well as in giving birth to the new South American Community.

We will all work together on this mission: governments, parliaments, civil society, and the bodies and institutions of the Andean Integration System. Because today, more than ever, we can say with Bolívar, "our Native Land is America."

"Globalization, Integration, and Development: Towards a new Andean and South American agenda"

Address by Andean Community Secretary General, Ambassador Allan Wagner Tizón, at the opening ceremony of the Fifth Forum of Presidents of the Andean Legislative Powers

Quito, November 25, 2004

PHYSICAL REGIONAL INTEGRATION: THE NEED FOR INNOVATIVE PROJECT FINANCE MECHANISMS.

The two principal activities being undertake so far for the physical integration of Latin American countries are the Puebla-Panama Plan (PPP), which includes Mexico and the Central American countries, as well as Panama, and the Initiative for Regional Infrastructure Integration in South America (IIRSA), which embraces all South American countries, including the Guyanas.

The Initiative for Regional Infrastructure Integration in South America, (IIRSA). IIRSA grew out of a proposal made by the **President of Brazil** in a meeting of Presidents in 2000, and has been supported by three regional finance organizations, namely, the Inter- American Development Bank (IDB), the Andean Development Corporation (CAF) and the Financial Fund for the Development of the River Plate Basin (FONPLATA). In 2003, the Initiative demonstrated a new dynamism, following a period in which little progress was made owing to the suspension of an inter-ministerial meeting originally planned for Caracas in the second half of 2002 and a hiatus during which a Strategic Vision of continental **development to 2020** was formulated. In 2003, the Technical Executive Groups (GTE) meeting in Quito and Santa Cruz de la Sierra selected a key project to serve as an anchor for the other activities relating to each of the ten main integration and development clusters, which had been previously identified by representatives of the participating countries. Project selection proceeded by consensus rather than being based on a formal evaluation process.

The chairmanship of the IIRSA Executive Management Committee rotates, and until 2003, was held for a six-month period by a country, during which period there is one meeting of the Committee.

There are various matters to be resolved within IIRSA, one of the most important being **project financing**, especially in the most heavily indebted countries. In some cases, the principal beneficiaries of a project could be residents of countries distant from where it is implemented. It is recognized that the financing of some projects would require innovative mechanisms.

The Puebla-Panama Plan (PPP): the PPP is an initiative launched in June 2001 by eight Meso-American countries to strengthen regional integration and promote social and economic development projects in the south-south-east of Mexico and the Central American Isthmus. Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and the nine states of the south-east of Mexico, participate. The Meso-American region covers more than a million square kms with a population of 64 million inhabitants.

In terms of physical infrastructure, progress has been made with the Meso-American Transport Initiative, previously known as the Initiative for Highway Integration, and which now includes maritime and air transport; 54% of the financing required to complete the International Network of Meso-American Roads has already been secured. In the case of the Pacific Corridor, by June 2003, 81 % of the funds needed to repair the system of roads that makes up the region's main integration route had been obtained. The projects are basically financed by IDB and the Central American Bank for Economic Integration.

From June 2002, the PPP has been undertaking a series of consultations with Meso-American civil society, expecting them to assume a more active role in the different areas of the Plan, so contributing to their sustainability.

+ New projects towards integration.

IIRSA

Is an initiative undertaken by the 12 South American countries aimed at promoting the development of transport, energy and communications infrastructure under a regional perspective .

Its main purpose is to create a common agenda related to actions and projects of infrastructure integration regarding transportation, energy and communications. In particular, on the matter of infrastructural integration, the Presidents agreed on the creation of the IIRSA Initiative, with the central goal of advancing in the modernization of the regional infrastructure and the adoption of specific actions to promote the integration and social and economic development. This commitment is transformed into an Action Plan formulated at the meeting of South American Ministers of Transport, Energy and Telecommunications, held in Montevideo on December 2000 which established the main lines of action of IIRSA and became a framework for the development of IIRSA´s activities.

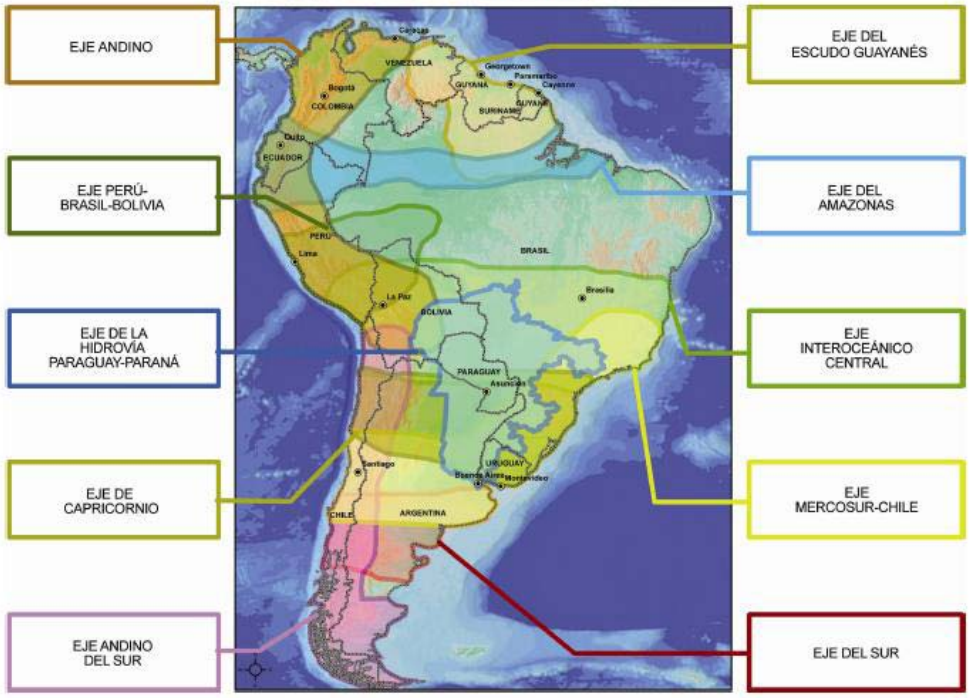
Why does the South American physical integration need a strategic vision?

Since the end of the eighties, South American countries have undergone a deep process of economic and political structural reforms to gain macroeconomic stability and resume the path of growth and prosperity required to eradicate poverty from our societies. These efforts have given rise to new ideas and roles in the private and public spheres, and and a great deal of progress has been made at the institutional level, with regard to the strengthening of democracy and a new approach to integration. However, there are still key issues that undermine our populations' well-being, dispel the hopes of a better future, and force us to reflect upon our ideas of development and our strategies to attain that goal.

I . I . R . S . A

INITIATIVE FOR THE INTEGRATION OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA

Mapa N° 1 – Ejes de Integración y Desarrollo



MODEL

IIRSA's Andean Hub

This hub is made up of the main articulation nodes (trunk road networks, ports, airports and border crossings) in Bolivia, Colombia, Ecuador, Peru and Venezuela. It joins the main cities in these countries through two big North-South road corridors: the Pan American Highway, along the Andean mountains in Venezuela, Colombia and Ecuador, and along the Peruvian coastline; and the Marginal Jungle Highway which borders the Andean Mountain Range at de los Llanos in Venezuela and the Amazon Jungle in Colombia, Ecuador and Peru. It covers a total area of 2,351,134 km^2 (equivalent to 50% of the Andean Community), and has approximately 92 million inhabitants, with a density of 38.15 inhabitants per square kilometer. Its Gross Domestic Product amounts to US$ 200 billion. The hub is characterized by horizontal production and marketing networks, particularly for commodities based on the processing of natural resources.

Regarding its comparative advantages, the following sectors represent productive development opportunities for the Hub's area of influence: agriculture and agro-industry, farming, poultry and pig raising, forestry and related industries; fisheries; leather and footwear; metal-mechanics; the iron and steel industry; the chemical sector (products linked to gas and hydrocarbon processing); textiles and tourism.

The sectors at which investment is traditionally targeted -hydrocarbons (natural gas and oil) and mining (coal, gold, silver, marble, granite and platinum, among others)- are interesting options for investors.

Regarding its development potential, the Andean sub-region has a market of over 115 million inhabitants in an extended area of influence of 4.7 million square kilometers, with an added-value of approximately US$ 260 billion (80% in Colombia and Venezuela). It is institutionally framed in an integration process which has already been in place for 30 years (the Andean Community of Nations) and has established a clear pattern of gradual normative convergence and coordination of investment in transport, energy and telecommunications interconnection infrastructure.

Its biological and cultural diversity -25% of global biodiversity- is blended with a diversity of ecological levels which brings about the interaction of maritime coasts with the Andes Mountain Range and the sloping down to the Amazon Jungle to offer favorable conditions for the cultivation of different exotic products in view of climate and seasonal variations.

Finally, the above-mentioned aspects blend so as to generate a great tourism potential in the Hub, supported by contributions of the colonial era and the long tropical and equatorial coastline, the cultural and folk diversity of the different populations, and the challenges for exploring pristine territories of unmatched ecological value.

+ MEGA projects towards integration.

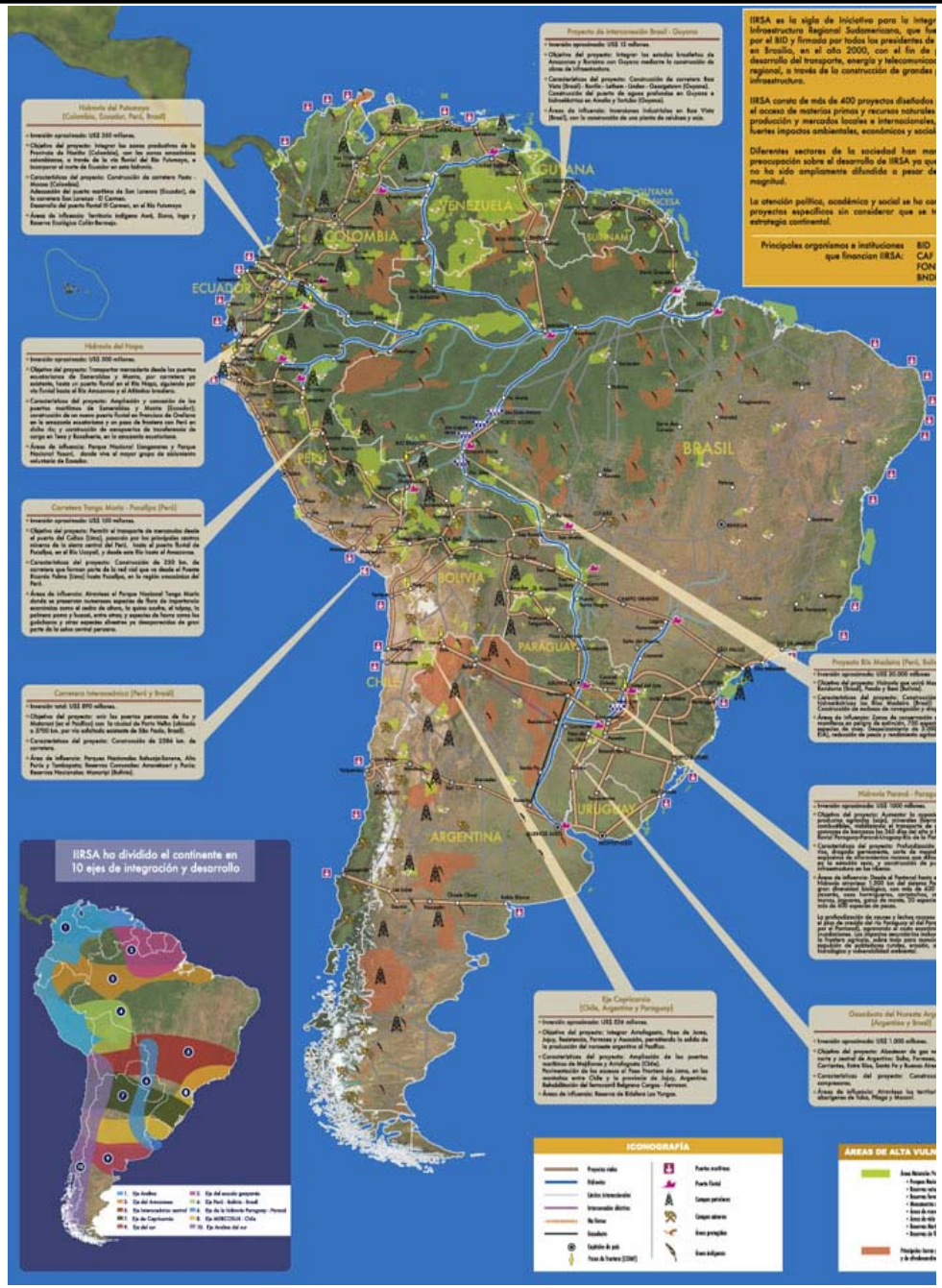
Based on the guiding precepts and principles defined by the South American Presidents, Transport, Energy and Communications Ministers of the twelve countries prepared an Action Plan for the Integration of Regional Infrastructure in South America which privileged the approach of Integration and Development Hubs (EID), supplemented by Sectoral Process actions to improve competitiveness and promote the region's sustainable growth.

Integration and Development Hubs

Integration and Development Hubs are multinational territories involving natural spaces, human settlements, production areas, and current trade flow. Infrastructure investments will create new opportunities of sustainable development for the population of these territories.

Integration Sectoral Processes

Integration Sectoral Processes are aimed at identifying regulatory and institutional obstacles that hinder basic infrastructure development in the region and at recommending actions to overcome those obstacles. Sectoral Processes are transversally structured, so that each one influences all the other Integration and Development Hubs.



Syntesis of the portfolio of projects, IIRSA 2010.

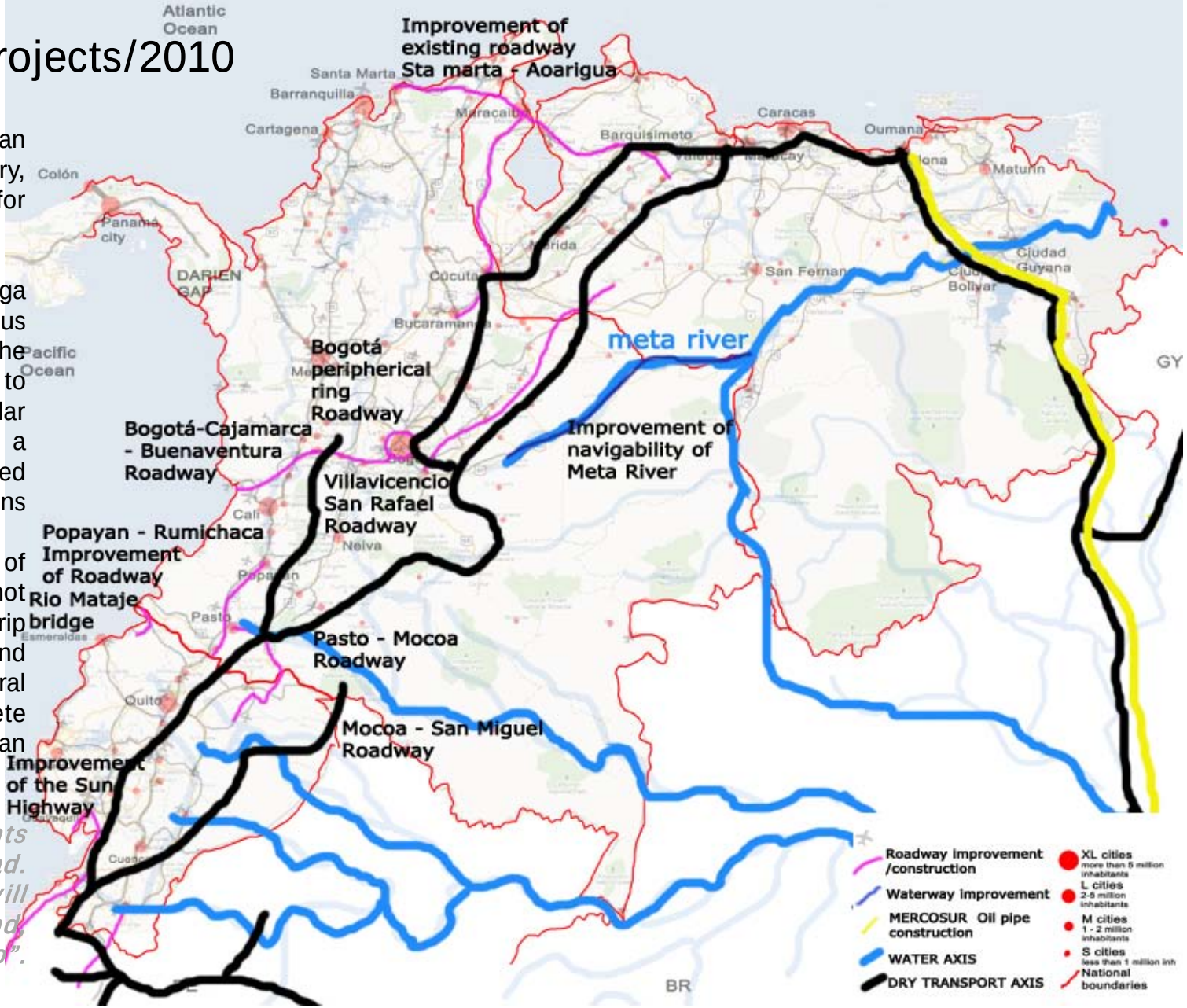
MODEL

IIRSA's portfolio of projects/2010

IIRSA considers the South American continent, a discontinuous territory, and the projects are all looking for BRIDGES to unite the "islands".

But he main opponents to this Mega Projects, are still the indigenous communities, who claim to be the direct victims of the attempts to destroy all the lasting vernacular communities. For them, just as a start, the Amazon forest is sacred land, and the andean mountains house the principal Gods.
For them, the ecological impacts of this projects are too strong and not reversible, they mean the last strip against the indigenous territories and it would be the end of bio and cultural diversity, not to mention the complete break with the ancient Andean communities.

"For us, what the governments call development is just mislead. If we accept this projects, we will be accepting the sack of our land, just like 200 years ago".



Within the framework of IIRSA, governments have set up a portfolio of 510 infrastructure projects (transport, energy and communications) grouped in 47 Groups of Projects, with an estimated investment of US$ 74.5 billion up to December 2009. Additionally, the governments selected a limited set of high-impact projects for physical integration in South America to which special attention will be paid for their short-term funding and execution ***(Implementation Agenda based on Consensus 2005-2010).*** *The "Agenda" comprises a set of 31 projects and represents an estimated investment of US$ 10.376,70 million.*

+ Mega projects towards integration.

Although all the projects are based on the principles of functionality, multimodality, low cost, low co2 emissions, sustainable transportation, there is a wide gap between the number of projects and inversions on roadways and the ones in railways: few projects of railway construction, improvement or even less, integration of the systems, are made on the south of the continent, on the northern andean, none.

The railway is still today a tabu for the Latin American governments and planners, and in the Northern Andean territories, even with the last improvements made specially by the Venezuela government, as an impossible venture.
Latin America's geography does not lend itself to non urban passenger trains for many reasons, namely a topography frequently interrupted by geographic obstacles; the distances between large cities; and single track, often narrow gauge, with predominantly slow cargo traffic. So, in the last forty years, with competition from buses and aeroplanes competition, the Latin American passenger train has become an endangered species. Nevertheless, in 2003, it made a comeback, launching a new offensive, principally in Argentina and Chile. Until then these two countries had adopted very divergent policies.
There was little new, with reference to the privatization of Latin American rail services, in 2003, basically because almost all had been transferred to the private sector. One exception was Uruguay, where a free entrance model was introduced whereby any operator wishing to use federal state track, could do so by paying the corresponding toll. In Paraguay, the concessionary process remained dormant as the line, inundated by the Yacaretá Binational Hidroelectric artificial lake, continued without the hope of being relocated in the short term. In Argentina, the national government considered ways to restrengthen, possibly through a new auction, the Belgrano Cargas Railway, the administration of which had been placed in the hands of the Unión Ferroviaria, a worker's trade union.

The main project involving railways is the reactivation of the historical Transandean Railway (Ferrocarril Transandino). This one is the main railway line of the south and goes from Buenos Aires to Santiago. The project comprehends the extension of the lines until Iguazu.
The best transport infrastructure of Latin America is without any dubt, in Brazil, which is also the one with more developed railways and the most interested one in the construction and integration of them with the rest of the countries because of the need to get to the Pacifi ocean. On the economic crisis in 1997, the development of railways in the south or Brazil stopped, and has not shown a clear trend in new trade between Brazil and its Mercosur partners, or other Southern Cone countries. However, it is hard to deny that such trade will grow in the medium and long.
However, it is clear in the projects of IIRSA that the most advanced railway systems are being constructed in the south of the cotienet, and the north andean is surly behind in this field, being pulled by the Venezuelan interest in the Colombian Pacific coast.

In addition, increases are expected in trade between Brazil and East Asian countries, a fraction of which could rail to or from ports in the Pacific.

+ Direct relation between Infrastructure and Sustainable Development

Main relationships between infrastructure and the growth of GDP:

•The accessibility offered infrastructures enables territories to adapt to variated economic activities. Infrastructure is purposefully designed and built with the aim of creating or uniting regions within a single national territory. Roads, railways, ports, communications, energy, drinking water and irrigation facilitate national social integration and improvements in well-being.

•Infrastructure is linked to economic and political integration at the supranational level, where it acts as a crucial agent. It is conceivable that the absence of infrastructure may prevent integration and trade, and an inappropriate or unsatisfactory infrastructure may cause a drop in a country's **competitiveness.**

•Infrastructure imposes an economic order on a territory. Indeed, it becomes a determining factor in how the territory is organized and its economic development by supporting increases in productivity and the country's competitiveness.

Transport services that use infrastructure have an impact on company costs, given that the availability and quality of the infrastructure enable logistic chains to be more efficient. In addition, the reduction in unit transport and communication costs, and the resulting increase in international connectivity, have facilitated the development of new forms of production that replace the Fordist model with the more flexible Toyotist production method that involves the "just-in-time" concept for both intermediate and final products. This new way of creating wealth is characterized by new complementarities in the production process based on the factor productivity which, along with the available infrastructure, determines the location of production plants.

During the time when railways were State-run (at least in principle), railway projects were assessed using the same criteria as for truck projects. With the advent of railway concessions, the situation became more confused, and there are probably railway projects that are socially but not commercially viable, or whose optimum quality varies according to the evaluation criterion adopted (social or private). Since they are now assessed using private criteria, some socially profitable projects tend to get left aside, possibly even some of binational importance. This bias could be corrected by the adopted of efficient instruments that would provide incentives for socially viable railway projects while minimizing transfer of taxpayers' money. Road network and railway concessions have not corrected all the imbalances in terms of competition between trucking and railways and project evaluation and, in some ways, they have aggravated the problems. As a result of taxes on fuel and toll gates, the charge for heavy truck transit is still lower than the costs it generates as a result of externalities. Although technologically, it is increasingly feasible to charge the right amount, it is more difficult institutionally if the infrastructure is already a concession, since the basic conditions of signed contracts would have to be changed. Nevertheless, those countries in the region that have made little headway in road concessioning have the opportunity to take account of the experience of pioneering countries with a view to enhancing policies.

+ Direct relation between Infrastructure and Sustainable Development

Infrastructure matters significantly for productivity or competitiveness and growth.

Development today depends lots of crucial factors such as the quality of institutions, the careful design and application of economic policies, openness to trade, planning of sustainable development, economic regulation, security for private investment, access to financing, development of human capital and appropriate criteria for evaluating projects and assigning scarce resources.

Reforms to improve and extend infrastructure services have also been fueled by the realization in developing countries that infrastructure levels and quality have a huge effect on economic growth and poverty alleviation and that current levels and quality are inadequate. Infrastructure services are critical to the production and provision of goods and services and significantly affect an economy's productivity, costs, and competitiveness. Policies on the provision of infrastructure services reverberate throughout an economy—and poor services often limit competitiveness in other markets.
Numerous studies illustrate the impact of infrastructure on economic growth. A 1 percent increase in a country's level of just one type of infrastructure, can increase gross domestic product (GDP) growth by 0.20 percentage points

Effect on GDP Growth of a 1 Percent Increase in Infrastructure Assets
(percent)

Type of asset	*Direct effect*	*Indirect effect (via K)*	*Total effect*
Power generation capacity per worker	0.07	0.02	0.09
Paved roads per worker	0.05	0.02	0.07
Telephone lines per worker	0.14	0.05	0.19

Note: The K effect refers to the impact via capital accumulation.
Source: Calderon and Serven (2003).

+ About importing of settlement model

As illustrated in the axioms 2 and 3, the importation of models, or the altruistic intention of learning from Europe and North American realities, its' not a new issue in Latin America actually it has become a paradigm, and even a taboo: its is hard enough to talk about the right way to interpret the reality and the possible future in a certain territory , so how to interpret reality, learn and use this knowledge in a totally different environment?
Is it possible to find a way to learn from territories and apply without falling into the mistake of copying and misunderstanding the real needs??

The answer of this question, is an open invitation to experiment, and propose better futures. Because is in the variety of opinions and ideas, that the construction of reality becomes interesting, and furthermore, viable.

The geographical difficulties, the weakness of the native communities, the lack of self – definition, a story of slavery and subordination, the lack of vision, and many other reasons, have blocked the real and substantial development of Northern Andean territories, specially the infrastructural development of networks. This territory is **a place confluences**, of natural , cultural, economical and political resources. But even when many would be interested in a development of this potentialities, still there seems to be who takes advantage of the delays in this matter. It is a very rich and potential land, full of opportunities that are still unexplored. There is a lot of inherited violence in the communities mixed DNA, and there is a big historical debt to pay to native indigenous specially, but not only. **Racism and xenophobia** are still forces that drive the daily dynamics of the cities and the nations. It wouldn't be too much to remember how is the territory is lacking an **agrarian reform**, that distributes in a more equal way the land, because it never went through a real revolution from underneath.
At this point, for rurality to overcome its condition of inferiority, and gain its dignity, a real polycentric model of territorial development, based on infrastructures that serve all populations and provide connections between the big and small urban nodes, seems a very plausible way to achieve a balanced future.

"I love the lands between Río Grande and the Chilean Pole because they are all part of one sole country, my country"
--Pablo Neruda

+ Polycentrism in the Northern Andean territory.

There's no such thing as a Latin American settlement model, even with all the common economical features presented. Not only because of the scale and size of the continent, but mainly because of the varied cultural and social ways to approach to urbanity. Although, countries as Argentina, Chile, Peru and even Brazil, have developed patterns of very **centralized distribution of population**, centralizing also the main power in cities that today correspond to the biggest metropolis of the continent: the great Buenos Aires, The great Santiago, Sao Paulo, Lima. On the other hand, in the north as in Colombia and Venezuela, the distribution of the population has been made in a more **axial way**, developing on middle size settlements over the Andes and the Atlantic coasts. This distribution has been misunderstood as a polycentric territory, referring specially to the one over the Andes, with the set of cities, that was developed **over a network of commercial routes, determinated in the past by walking *arrieros* (muleskinners or teamsters) that connected all the distant urban poles, routes where later in time, the first railways helped to build the systems between this cities, and later the roadways completed the networks**. But the question now is if the network as understood in the Latin American context, is enough to be able to sustain itself in a not to far away future, as a real powerful system that can provide also an equilibrated development for all the population, not only for some segments of it.

There are lots of signs of the crisis of this settlement models based on the private car mobility, and the signs as the ones of a sickness are present in the territories in the way of pollution of the air and water, the increase of the prices of the land in the centers and the decline of the poorest areas, and the continuous immigration of rural population to the cities.

In the actual northern andean territories, the reality shows that the predominance of an urban epicenter metropolitan urban region, creates for the regions (wider territories surrounding the metropolis) disarticulation, isolation, unbalance, and serious spatial dysfunctions, that can be read from the high rates of violence and increase of the "under the line of poverty" populations, as the Gini index shows.

The urban progress or the development as we have understood until now, is not leading us to a real sustainable development, because in the way we are thinking of polycentrism so far, the regions around the urban cores end up acting as servants of the urbanity, and this "servitude" is the beginning of the inequalities present on the territories. In the andean cities, the relations are basically from the outside-in, where the metropolis is devouring all the land around as a hunger predator that consumes everything available and then, when has nothing else, dies of hunger.

More than the growth of the cities, the phenomena of Quito, Bogotá, Medellin, Mérida, Caracas, should be described an the excessive physical agglomeration of people, given than the size of the urban land (-scape) increases, but the urbanization services does not in the same way.

A DOUBLE-EDGE WEAPON: Improvements for the life quality are made inside the metropolis, increasing with this the urban quality of life, which at the end will make visible the low quality in the rural environment, and will attract more people inside...

... but, do we want metropolis to grow?
Isn't that what we are trying to avoid?

The actual governments, supported and advised by European and North American planners, have been trying to ***redevise the models,*** proposing ways to integrate communities, investing in the most needed spaces, and designing projects to develop and redevelop territorial identities an potentialities, that could erase the traditional abandon of the state in this apart territories.

So far, most of the projects that are made, suffer them selves of isolation, because they are basically roadways, that trying to connect some territories, divide others, and that in few cases, take in consideration the opinion of the communities involved. The highways constructed to connect the metropolis of Latin America with its surroundings, tend to permit the people who has a private car to travel but the others? Will probably serve to provide food on the toll roads...

Initiatives from inside the cities and models of new urbanism are being developed in the last decades. The improvements made in Bogotá and Medellin, with the insertion of integrated-multimodal transportation systems, helped to raise the urban life quality and to make the cities a bit more accessible to everyone, therefore more equal. It has to be granted to the governments, specially the local ones working in knowledge-lines, the applause for changing in few years the entire way this cities where understood, not only by the rest of the world, but by their own citizens. It will for sure promote the growth of a conscience of the urban culture from the inside, of the poorest areas, and make more sustainable the future of this cities. This transformations, though, are made in a inside-out way, conceiving the cities as islands, with no surrounding territories, and other poles, and other municipalities with their own characteristics and needs. This isolation of the city as a whole themselves, follow the path of the cathedrals on the desert, growing with no limits but denying the surrounding realities.

Medellin, libraries network and polycentrism

But the element that is staying behind the eyes looking at the system of libraries or the library itself, is that Medellin is not an island: it is inserted in a region, in a bigger territory, from where is historically rooted, and absolutely dependent.

Polycentrism we should be chasing at is the one about the development of small and medium size centers that can emerge as real territorial options when thinking about quality of life. This urban nodes, poles or centers should provide:
+ quality of life that can be as good as in the main metropolis; Is a model of giving an option to the inhabitants of this territories.
+ care for the main fonts of supply of basic needs : water, food, energy.
+ a motor for the articulation of the elements of all the regions in between big nodes. The centers must assume their roles as *orderator,* not landlords.

The model we should be looking for in order to evolve into equilibrium is a system based on the integration of networks, of mobilities, that can help us to close the gap between the urban and the rural, the rich and the poor, and maybe settle a bit the historical social debt, so we can stop the violence response from the less fortunate communities and bring closer the inequalities.

Only the systemic networks, the ones that are not only functional but are multimodality oriented and multidisciplinary designed, provide real sustainability.

Polycentrism can not mean to OWN, can not mean to POSSES adjacent territories. The big nodes of the system should not play the part of a conqueror that enslaves around, because this is not the colonization time anymore!
We have to overcome the past and go towards a real independence in our own land and from our own countrymen!
The centralized model on a major metropolis who owns all the power, makes life expensive and troubled, creates subordination on the territories and convert ruralities into peripheral taxpayers.

O to live in a small gone Horatian suburb
lost in its melancholy stream of traffic –
- R. Lowell, 1973

Sustainability, sustainable development, sustainable… These words have plowed themselves into mainstream development dialogue and literature, if not entirely into popular jargon. One does not need to look far to find references to sustainable housing, consumption, forestry, agriculture, etc. Some of these sectors lend themselves naturally to the sustainability concept and, indeed, essentially formed the basis for modern ideas about sustainable development. The word sustainability has, in some senses, proved useful in itself, by at least making more explicit the need to balance environmental, social and economic development objectives. But, at the same time, the increasing ubiquity of the use of the word runs the risk of watering down its true meaning. When sustainability becomes associated with more and more, it might actually start to mean less and less.

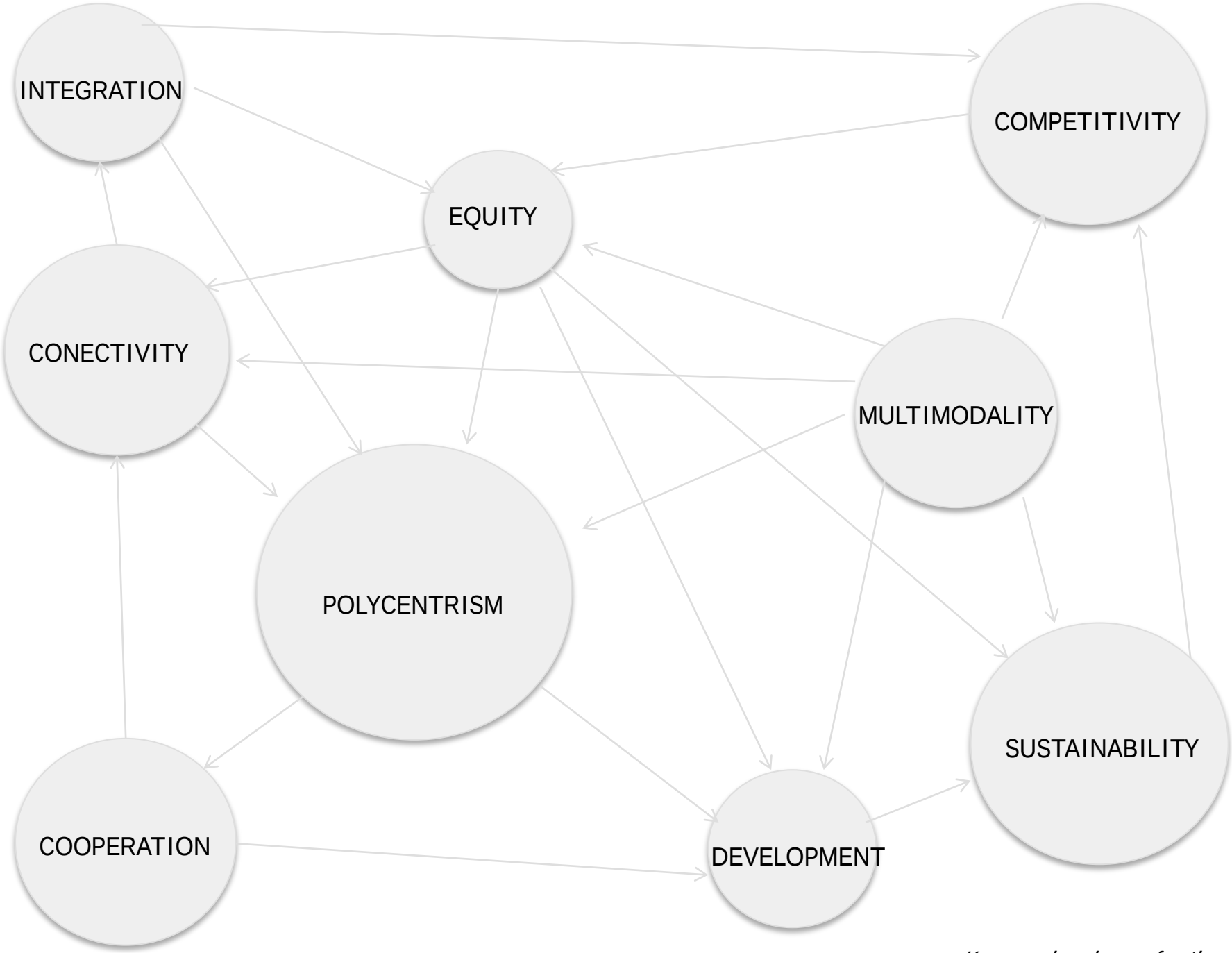
From "Sustainable Urban mobility, exploring the role of the built environment", PC Zegras

"Integration will mean to overcome the delays in the infrastructural networks, as the way to connect the inland territories and with the rest of the world. We will finish well what we started, multiplying the development in double sides highways, the river ways and the multimodal transport, ***including the railway****. In a connected nation rurality won't be a source of inequalities, but will be a source of richness and production, permitting the food supply to the cities and the opening to the international trade, closing the ways of illegality and war. The integration will permit the cultural promotion in order to bring out the best of every region and the construction of an integrated nation."*

President JM Santos-Colombia, 2010.

… THOSE THINGS POLITICIANS LOVE TO SAY

MODEL



Key words scheme for the polycentrism

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