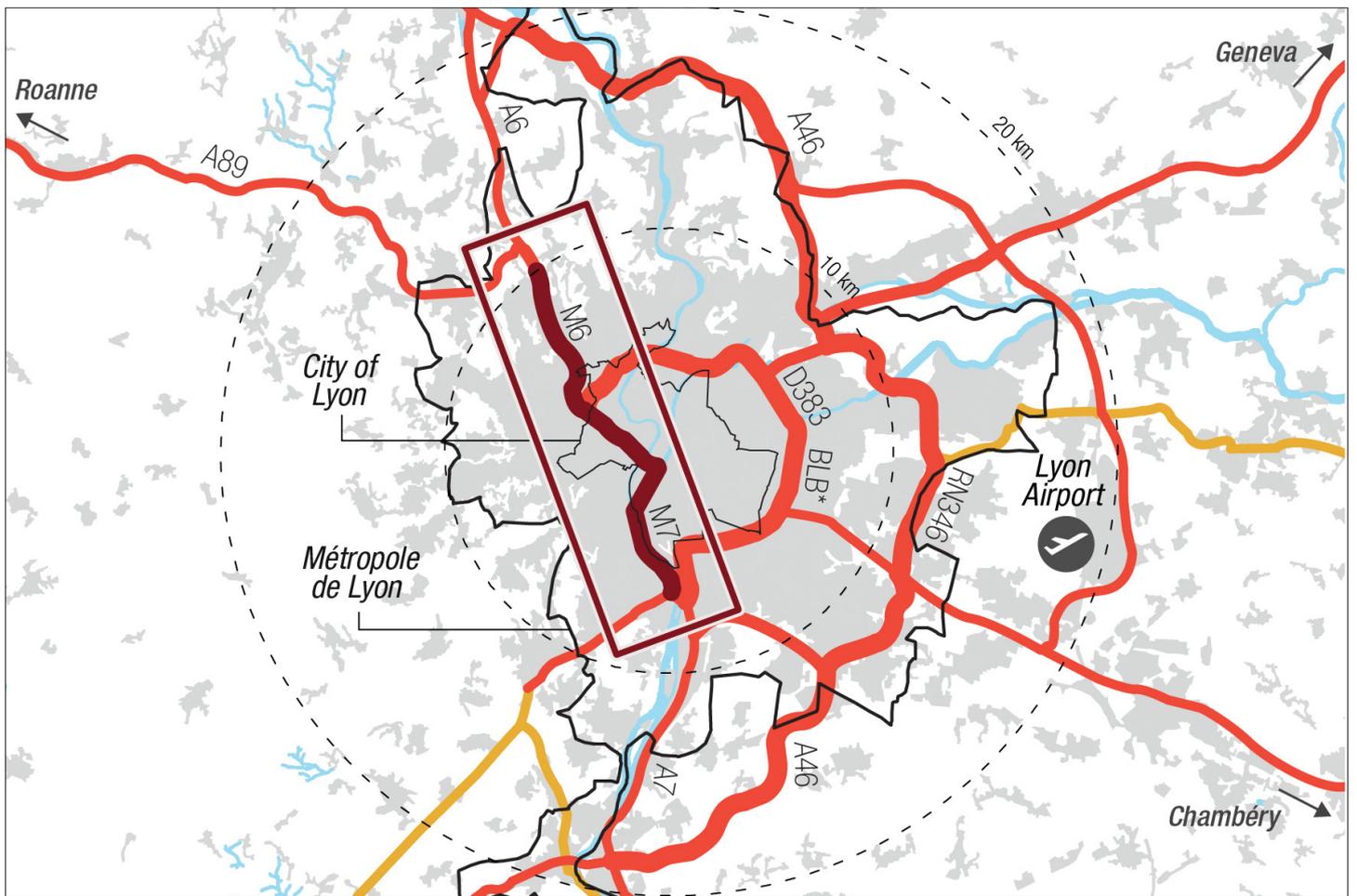


LYON. REGAINING THE RIVERFRONT

TRANSFORMING M6/M7 HIGHWAY CORRIDOR



DECEMBER 2020

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LYON

REGAINING THE RIVERFRONT

TRANSFORMING M6/M7 HIGHWAY CORRIDOR

Case Study Report for the METREX *From Roads to Streets* Expert Group
December 2020

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FOREWORD

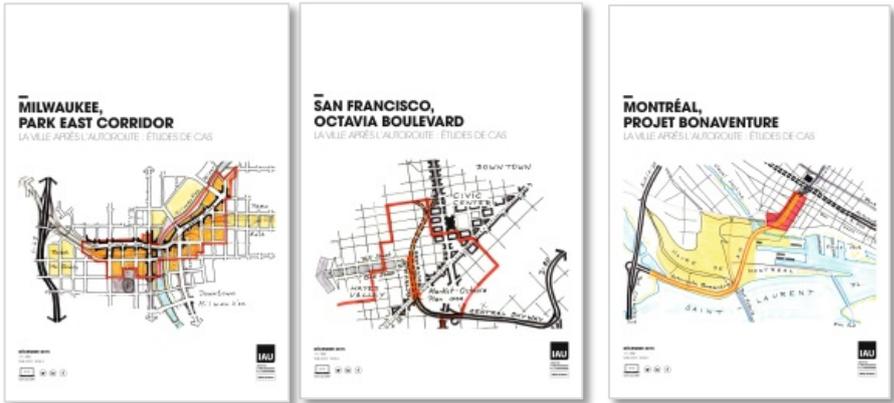
CONVERTING HIGHWAYS, RETHINKING CITIES

All over the world, cities and regions are confronted with the now-ambiguous heritage of extensive networks of highways and their fragmented (sub) urban landscapes. Because they were built they tend to be used: so these major road infrastructure systems play a role in moving people and goods within metropolitan areas, even if they may not be the most efficient way to do the job.

Highways with segregated interchanges create physical barriers within the cities and in their fringes; they limit pedestrian and bicycle movement and sever access to waterfronts and nature; they reinforce the social deprivation of roadside housing neighbourhoods and hinder regeneration efforts. The high volumes of traffic these highways promote generates noise, dust and air pollution, raising health and social justice issues. By providing seemingly easy access for cars and heavy-goods vehicles, extensive highways networks generally tend to encourage car-centric lifestyles, urban sprawl, mono-functional uses of space which in the end leads to more traffic and congestion.

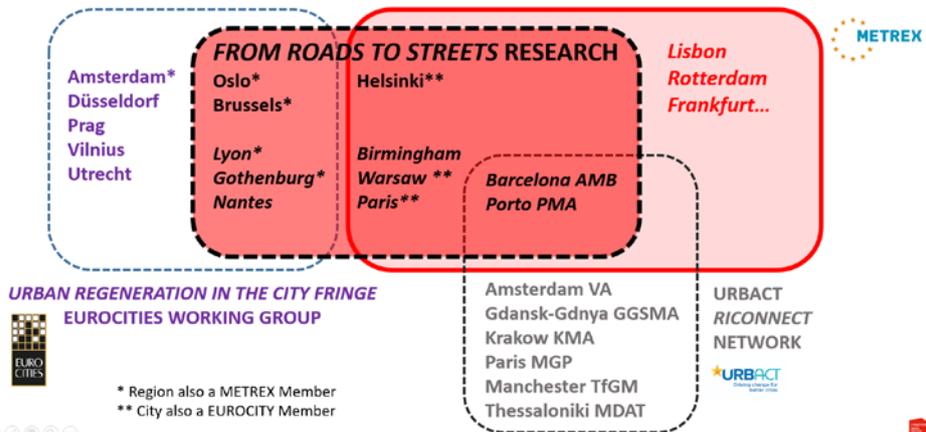
In the last decade, social and economic patterns have changed, resulting in growing aspirations for the vibrancy of city life and car-free living in denser, mix-use, neighbourhoods served by more flexible, multi-use and greener public spaces, while keeping in close contact with nature. Cities and metropolitan regions respond to these trends by redeveloping former industrial areas and car-oriented urban fringe with more intensive land-uses, with the support of new metro, tramway or expressbus lines. These projects are increasingly becoming catalysts of green development strategies; sustainable urban mobility plans and climate-neutral policies.

The in-Covid and post-Covid contexts reflect a rapid and significant change in mobility, housing, working and leisure patterns, opening a new window of opportunity to reset our urban development and transport models. Highway transformation can help transitioning cities and regions towards more liveable, just and climate-neutral development patterns.



International case study reports on highway transformation
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FROM ROADS TO STREETS METREX EXPERT GROUP



The METREX EUROCITIES URBACT Learning Platform in March 2020
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Learning from international experience

Many cities –including Portland, New York, Seoul and, recently, Paris– have successfully removed or transformed stretches of urban highways, replacing them with multi-use boulevards lined with mixed-use new developments or even new linear parks and promenades. Why are they doing that? What happens with the traffic? What are the benefits and costs? Do these projects get public support?

To find answers to these kind of questions and inform ongoing projects and reflections in the Paris region, I initiated in 2010 a long-term research programme on *Metropolitan Avenues*¹ at the *Institut Paris Region*, the urban planning and environmental agency for the Paris metropolitan region².

As part of the programme, I examined over twenty highway-to-boulevard experiences on three continents (America, Asia and Europe). Of these, nine cases were studied in depth on-site, with their reports published in French:

- Seoul *Cheonggyecheon Expressway* (2013)
- San Francisco *Embarcadero Freeway* (2013)
- Vancouver *Viaducts* (2013)
- New York *Westside Highway* (2013)
- Portland *Harbor Drive* (2014)
- New York *Sheridan Expressway* (2014)
- San Francisco *Octavia Boulevard* (2016)
- Milwaukee *Park East Corridor* (2016)
- Montréal *Projet Bonaventure* (2016)

The most significant result from this research is that these strategic metropolitan projects are complex and conflictual, but have long-term positive impacts on traffic and mobility, city regeneration, and the quality of the urban environment, often far beyond the project boundaries. A summary of results in English can be found in a paper called *Reinventing Cities: From Urban Highway to Living Space*³ (2018) reproduced in the Appendix of this report.

This research has influenced projects in France, including the Paris Seine Banks pedestrianisation (2016) and the ongoing reflections on the future of the Paris Périphérique and the region's highways, with the organisation of an International Competition on the *Future of Grand Paris's Highways* in 2018⁴ being one of the first steps.

The METREX *From Roads to Street* joint learning platform

In March 2020, METREX, the Network of European Metropolitan Regions and Areas, launched "*From Roads to Streets*", an expert group to serve as a platform for the exchange of knowledge and experience on the transformation of urban highways into city streets (places to move, to stay, to live, and to work in), as "*a key measure to transform the urban fringes of metropolitan cities and regions*"⁵. The Institut Paris Region is the lead partner.

The METREX *From Roads to Street* group works in close cooperation and support of the EURO CITIES "*Urban Regeneration in the City Fringe*"⁶ working group created in April 2020 with eight participating cities: Amsterdam, Brussels, Düsseldorf, Lyon, Prag, Vilnius, Göteborg, with Oslo as the lead partner⁷. The purpose of this group is to exchange experiences on the conditions and methods for transforming urban fringes in three main directions: overcoming highway barriers, creating quality public spaces, and managing radical land-use mix.

¹ *Avenues métropolitaines*. <https://en.institutparisregion.fr/know-how/international/rethinking-post-carbon-cities.html>

² Former Institut d'Aménagement et d'Urbanisme de la Région Île-de-France (IAU ÎdF). <https://en.institutparisregion.fr/>

³ **Urban Design #147, Urban Design Group UK, Summer 2018**

⁴ *Les Routes du futur du Grand Paris*, Forum Métropolitain du Grand Paris, Apur, Institut Paris Region, 2019.

⁵ Henk Bouwman, General Secretary of METREX. www.eurometrex.org

⁶ *Edge of Centre Transformation II, Urban Regeneration in the City Fringe*, EURO CITIES, April 2020.

⁷ Pernille Grimeland Røsvik, Project leader, with Jørn Roar Moe, Head of Planning and Peter Austin, Planning Advisor, City of Oslo.

The METREX *From Roads to Street* group aims specifically to further investigate the question of why and how converting traffic-oriented highways into streets could contribute to an environmentally friendly mobility, help design walkable, safe, socially balanced neighbourhoods, and be a driver for the revitalisation and intensification of fragmented, mono-functional, city fringes. The group draws upon the experience and expertise of its members in this field, and brings a regional, wide angle, perspective in the discussion.

Both METREX and EUROCITIES groups work in collaboration with a third network, the URBACT III 'RiConnect' action planning network, which consists of eight metropolitan and transport authorities: Porto Metropolitan Area, Gdansk-Gdynia-Sopot Region, Krakow Metro Region, Thessaloniki Region, Amsterdam Regional Transport Authority, Grand Paris Metropole, Transport for Greater Manchester, with the Barcelona Metropolitan Area (AMB) as the lead partner⁸. *RiConnect* proposes rethinking the mobility infrastructure in combination with metropolitan and local planning, to reconnect people, neighbourhoods, cities, and natural spaces.

These three networks are joining forces to share knowledge, experience, and expertise on these complex issues, in order to strengthen strategic and creative planning capacities of cities and regions. The idea is for planners from different horizons both "to learn through examples, discussions and presentation of projects" and "to learn by doing, through participation of group members in the local reflection and planning processes"⁹.

The European Union's policies, together with national government strategies, plays a major role in the planning, programming, and financing of highway networks in our cities and regions. The joint reflection of the three networks aims at raising their awareness of the social and environmental impacts of these policies and the need to shift funding streams towards their environmental integration and urban transformation.

The networks' joint learning platform relies on a series of events, both online and on site, such as peer to peer cooperation workshops; multi-actor transnational seminars; site visits; hands-on studios; as well as *ad hoc* and partner conferences.

The common work programme of the networks will cover a period of three years, with a final international conference anticipated in 2023 and intermediate events planned in 2021 and 2022.

Despite Covid-19 constraints, all three networks are now actively working after holding their (joint) kick-off meetings in early 2020: URBACT *RiConnect* (phase II) in Manchester (January 30-February 1), METREX online (March 30) and EUROCITIES online (June 24).

A case study-based learning process

The knowledge-based learning process is based on case studies of ongoing projects of highway transformation in different European partner cities. In-depth analysis and transverse comparisons are crucial to get a common understanding of local issues, strategies, planning approaches, reflections, and conflicts. Comparing scales, ambitions, framework policies, planning processes, and delivery instruments, can nurture the creative thinking of professionals from all networks to help find innovative and bold answers to the questions raised.

To trigger the process, the Institut Paris Region initiated a comprehensive research based on the voluntary participation from cities and regions as part in one of the three networks.

In 2020, four case studies of urban and highway transformation projects have been analysed with the help of local colleagues (many thanks to all contributors!) with the draft research reports soon to be published:

- Helsinki. *City Boulevards Strategy and Projects*
- Oslo. *Rethinking City Fringe Highways. Hovinbyen and Østre Aker Vei Projects*
- Lyon. *Regaining the Riverfront. Transforming M6/M7 Highway Corridor –THIS STORY*
- Brussels. *From Expressway to Boulevard. Delta-Herrmann-Debroux Project*

⁸ Joan Caba, Project Leader, Urban Planning Department, Barcelona Metropolitan Area.

⁹ *Urban Regeneration in the City Fringe Project Plan*, EUROCITIES-City of Oslo, March 2020. Revised Sept. 2020.

All draft reports have been written, illustrated, and mapped in way that can help understanding the local conditions, comparing projects together and learning from them. They share the same framework:

- Background: geo-historic context; current issues
- Strategies: urban development and mobility; climate-neutrality
- Project: highway transformation planning and delivery
- Discussion: questions and suggestions about the strategy and project
- Takeaways: first learnings to fuel discussions of the working groups

On top of these cases, we have started to document and map highway transformation ongoing processes in seven other cities and regions in Europe:

- Barcelona. *C-245 Road Integration Project/Busway 8*
- Birmingham. *Breaking the Concrete Collar A38/Snowhill Masterplan*
- Gothenburg. *Dag-Hammarskjöld Boulevard/Frolunda Project*
- Nantes. *A831 Highway Conversion/Busway 4 Project (delivered)*
- Paris. *A186 Highway Removal/T1 Tram Boulevard Project*
- Porto, *N12 Ring Road Improvement Project*
- Warsaw, *John Paul II Avenue Project*

In 2021, a comparative summary analysis based on these 4+7 cases is planned as part of our joint METREX EUROCITIES URBACT learning platform. The takeaways from these projects, and others perhaps (cities and regions are welcome to join!), should fuel the discussions and orient our work agenda for the months and years to come.

This report is about the ongoing story of the transformation of a major motorway crossing through the heart of the Grand Lyon city and region with heavy negative environmental impacts into an urban multimodal boulevard, potentially reconnecting the city on its natural riverfront.

In wider perspective, the Lyon experience is about how a city and its wider metropolitan region attempts to move away from automobile dependence and to transition towards a more mix-use, pedestrian-friendly, human-centred, ecological urban design structure.

I hope you will find food for thought and action in this report.

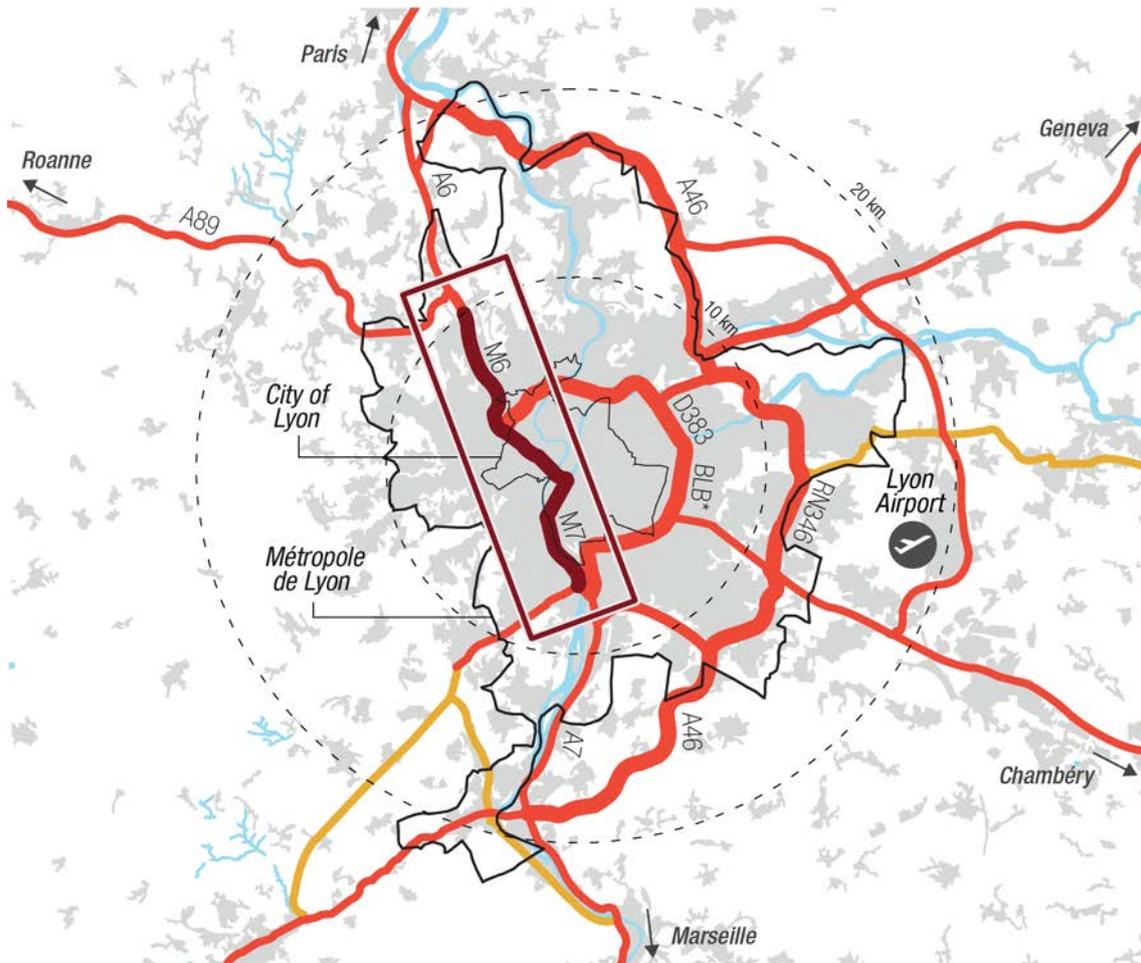
Paul Lecroart
Chair of the METREX *From Roads to Streets* Expert Group
December 2020

LYON. REGAINING THE RIVERFRONT TRANSFORMING M6/M7 HIGHWAY CORRIDOR



The M6 highway along the right bank of the Rhône, at the tip of the Confluence redevelopment district (left). Fourvière hill, site of the Roman city of Lyon, is in the distance.

© Lyon Mag DR



* BLB : Boulevard Laurent Bonnevey

- █ Ring highways
- █ Other highways
- █ Other main roads and expressways
- █ Axis subject to transformation (M6-M7)
- Project area
- Municipal boundary (City of Lyon)
- Metropolitan boundary (Métropole de Lyon)

N 0 10 Km

© L'INSTITUT PARIS REGION 2020
Sources: OpenStreetMap, ViaMichelin, Corine Land Cover, Métropole de Lyon



2016-17 Key data for Lyon City and City-Region

© INSEE 2017, Eurostat 2016

INTRODUCTION

A former gallo-roman capital and major Renaissance financial centre, Lyon is France's second largest metropolitan area with 1.4 million inhabitants in the Métropole de Lyon (Greater Lyon, or *Grand Lyon*), and 3.36 million in the larger urban region in 2017¹⁰. In the last decades, the Grand Lyon has witnessed a rapid growth and has emerged on the international scene as a dynamic and attractive City-Region. Métropole de Lyon, the authority holding powers for the city of Lyon (500,000 inhabitants in 2017¹¹) and for 58 other urban municipalities has strongly focused on policies aimed at combining economic growth with urban intensification and better liveability. The recent election (June 2020) of a new political coalition led by the Green party at the city and metropolitan levels should strengthen the walkability and greening components of the City-region strategies.

Located at the confluence of two valleys, between the Alps and the mountains of Central France, Lyon lies in a strategic infrastructure corridor between northern and southern Europe. Since the 1960's, the main motorway between Paris and Marseille (A6/A7) crosses the city right in its centre, bringing high levels of traffic, noise and air pollution to the 130,000 people living in its corridor, creating a major barrier effect and disconnecting the city from the river Rhône. An eastern highway bypass (RN346/A46) exists since the early 1990s, but it's a less direct and longer route for long-distance and regional traffic.

Since 2010, Lyon has launched a process to convert the national A6/A7 motorway into a multimodal metropolitan boulevard as a driver for the conversion of a 150-hectare industrial peninsula between the Rhône and Saône rivers, into a city-centre extension (*Confluence* project). In order to transform the highway, City and City-Region authorities initially decided, after public debate, on a new western motorway ring called *l'Anneau des Sciences* ("*The Science Ring*"). However, this highway project is no longer on the political agenda since the 2020 elections. The interesting challenge now is for the City-Region to find ways of reducing car traffic levels in order to transform the current highway into a 16 km long into a multimodal, bikeable, walkable and transit-oriented urban boulevard.

This case study analyses the current issues and ongoing multimodal transformation project for the recently (2016) decommissioned *Metropolitan* highway M6 and M7 inside the Grand Lyon limits. This targeted long section crosses through nine different municipalities of the Métropole de Lyon. Due to its scale, traffic volumes involved (over 120,000 vehicles per day) and strategic regional importance, the M6/M7 transformation project has the potential to deeply impact the metropolitan landscape and become a catalyst for major changes in regional mobility, development patterns and transformation of the Rhône river banks and valley. Drawing lessons from Lyon's long experience in transforming highways into streets, the M6/M7 raises multiple issues related to creative mobility management, social and territorial equity, and regional political cooperation.



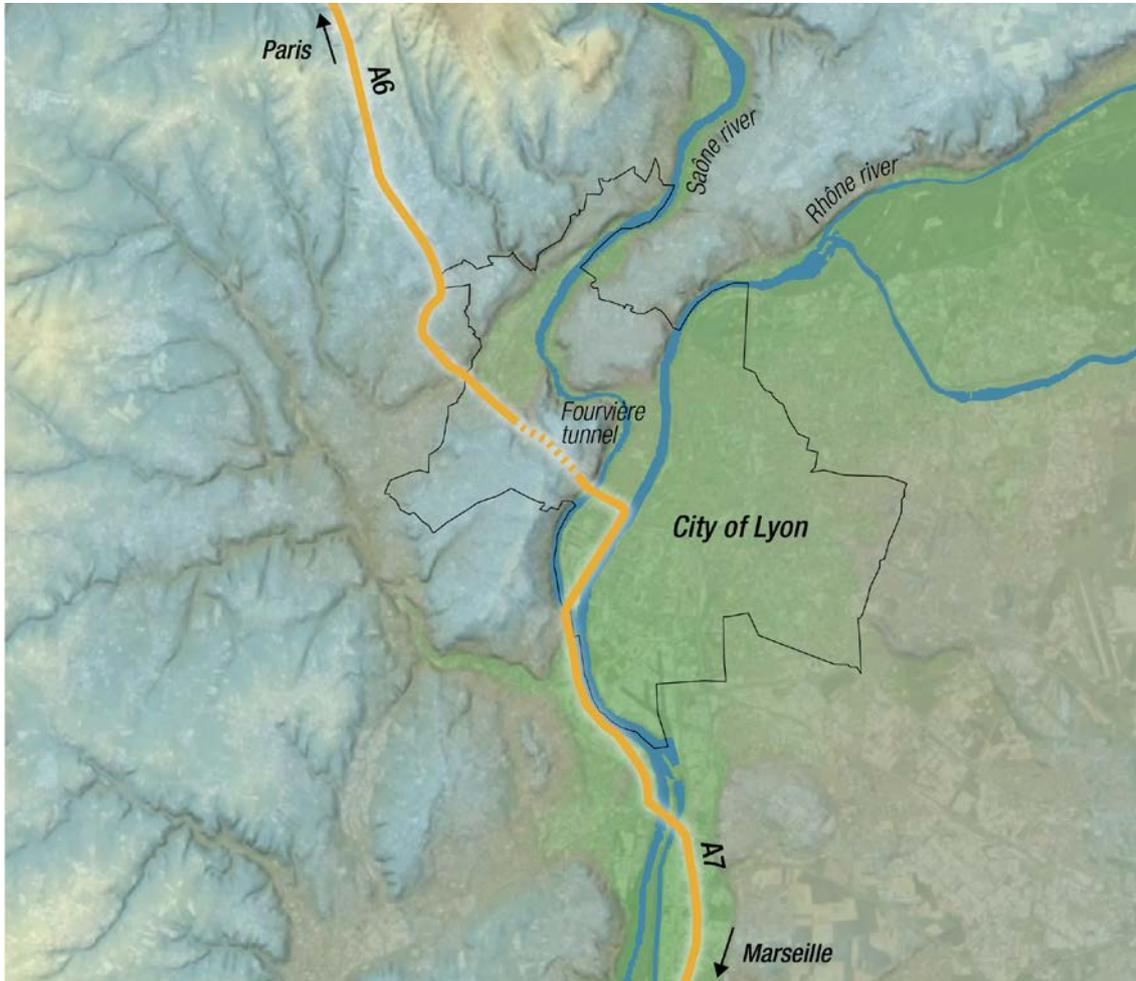
The M7 motorway along the Rhône river south of city centre during lockdown. *Confluences Museum* is right
© Pierre-Antoine Pluquet avril 2020-DR

¹⁰ Lettr'A2. Lettre d'information sur l'aire métropolitaine lyonnaise, Urbalyon & Epures, n°1 - septembre 2016. Source : INSEE.

¹¹ Dossier complet – Commune de Lyon, INSEE, 2020

1. Background. A City-Region Shaped by Highways

1.1. 20th Century Urban Highway Building in Lyon



Lyon's topography, a crossroad between rivers and hills

At the junction of the Saône and the Rhône rivers was founded the city of Lyon. The western part of the map is a hilly landscape, which makes settlement and road building conditions more difficult.

© Geoportail, modified by L'Institut Paris Region

The city of Lyon is located at a geographical crossroad, where the rivers Rhône and Saône meet, and where the Rhône basin eastwards meets the hilly landscape of the Massif Central westwards. The city of Lyon in the Rhône valley benefits from a strategic position that makes it a transport corridor of national and international importance for both rail and road infrastructure. Lyon is a junction point between the northern (Germany, UK) and the southern parts of Europe (French Riviera, Italy, Spain). This explains why major road, rail and other utility infrastructure cross through the city.

The decades after the World War II saw the development of France's motorway network. The A6 north of Lyon to Paris, built between 1960 and 1971, and the A7 south to Marseille, built between 1951 and 1969, are two of the most important arteries of this road system, with a total length of 772 km. These two highways link Paris to Mediterranean coast *via* Lyon earning it the nickname of the "Highway of the sun" (*Autoroute du soleil*). Both highways were joined in 1971, with the opening of the Fourvière tunnel, allowing vehicles to cross Lyon's city centre through the Fourvière hill and along the Rhône banks.

These axes rapidly started concentrating local, national and international traffic, crossing the city “without a traffic light like Los Angeles”, in the proud words of Louis Pradel, the city’s former mayor who supported the highway programme. Elected in 1957, Pradel was highly supportive of the idea of adapting the city to the automobile, seen as a symbol of modernity and progress. Not only did he initiate the construction of the Fourvière tunnel linking both highways, but he also pushed for the construction of the Perrache intermodal station. Open to circulation in 1976, this *megastructure* located on Lyon’s central peninsula spans over the A6/A7 highways. It was meant to become a multimodal transport hub, combining local traffic, through traffic, multistorey carpark, bus station, all connecting to the existing Perrache railway station.

Lyon’s highway network was mainly built between the 1960s and the 1990s. This road development programme was supported by reflections initiated in the 1930s and stopped by the World War II. A “Road development program for the Lyon Region” (*Programme d’aménagement routier de la région lyonnaise*), was drafted in 1933, impulsed by the central government.

One of the milestones was *the General Plan* drawn up by city engineers Camille Chalumeau and Pierre Eugène Lapeyre in 1935, which included a traffic plan and new road access. They saw the construction of heavy infrastructure in and around Lyon as an effective way to solve emerging traffic and congestion issues, and to accommodate the projected increase in car use.

These early plans included important road infrastructure that were later built, such as the Croix-Rousse tunnel (1952) and the Fourvière tunnel (1971), to connect the hilly western side of the city with the eastern part. Chalumeau’s General Plan also included an eastern ring-road project, today boulevard Laurent Bonnevey. Lyon was one of France’s first agglomerations to see the construction of a ring-road. The boulevard was inaugurated in 1960 and converted into an urban highway in 1970.

Due to the city’s asymmetric topography, road development plans mainly focused on the eastern part of Lyon, where the plain geography allowed for an easier road construction. This explains why highways were not built on the hilly side of the city, and why the boulevard Laurent Bonnevey was never continued to become a complete ring-road surrounding Lyon.

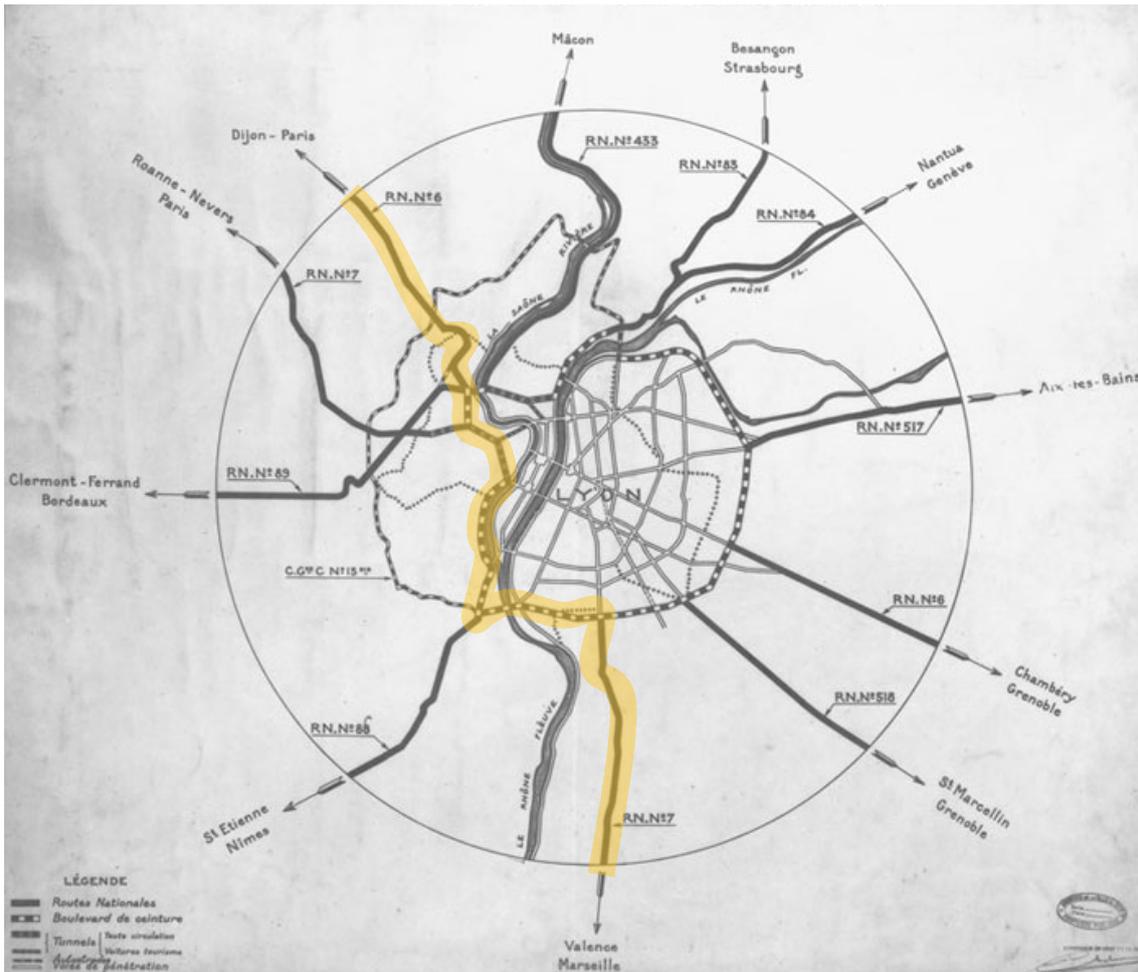


Fourvière tunnel and A6/A7 highway link under construction in Lyon, in the late 1960s

The highway crosses the Saône (centre) through the central peninsula replacing the the 19th C. plaza

Top right: the existing Perrache railway station. Bottom: the air ventilation structure at the of tunnel entrance.

Source: *Le Progrès*



1935 Ring Road Plan linking access roads in Lyon (1935 General Plan)

The north-south axis (underlined orange) that would later become the A6/A7 highways avoids the central peninsula and the city centre in this early plan. The eastern ring-road already was in city engineers' minds;

© Archives municipales de Lyon



The A7 motorway on the Rhône banks southwards in 1972

The highway crosses Lyon's central peninsula, bordering the former industrial and logistic area under regeneration today (Confluence)

© Studio Villeurbannais

1.2. Current Congestion Issues and Mobility Challenges



Congestion around the Fourvière tunnel

For many years, Lyon was infamous for traffic congestion, especially in the Fourvière tunnel

© Sipa Press, 2015

With the junction of the A6/A7 highways, the high-speed route across Lyon's city centre gradually became one of the city's most congested axes. These highways are today chronically saturated, especially during Summer holidays period. Lyon has become infamous for its traffic jams, in particular in the Fourvière tunnel. A 2013 traffic survey indicates daily volumes of 115,000 vehicles on A6 and A7 in Lyon, including 16,000 through traffic vehicles (15%), while a 2019 traffic survey¹² show an increase with 120,900 vehicles per day, including 5670 heavy goods vehicles (+5% in a year).

In the 1990s, the central government in collaboration with the City-region authorities proposed the construction of an eastern bypass highway to deflect traffic from Lyon to the outskirts of the metropolitan area. The A46, linking in the central part to the RN346, was open to circulation in 1992, but does not completely achieve its aim of diverting car traffic from the A6/A7. Despite important traffic volumes – 50,000 vehicles per day in 2013, including 25,000 through traffic vehicles (30%) – many car drivers still prefer the crossing through Lyon, as it is shorter and free of charge whereas the eastern bypass is longer and includes tolls.

Long distance traffic is a major issue in Lyon due to its key position in the country's road system for both national and international routes. Through traffic vehicles are no longer welcome in the metropolitan area, where approximately 400,000 inhabitants live less than 200 metres away from a highway¹³. These important traffic volumes generate urban fractures, congestion and thus nuisances for local residents (air pollution, noise disturbance...).

This issue is acknowledged by the different levels of government, as stated in the 2017 Metropolitan Structure Plan (*Schéma de cohérence territoriale de l'Agglomération Lyonnaise*). A 2018 document¹⁴ drawn up by the Regional-based National Authority for Environment, Planning and Housing (DREAL Auvergne-Rhône Alpes) indicates itineraries to avoid for long distance vehicles. All itineraries passing through the metropolitan area should be discouraged, including A6/A7 highways. Instead, bypass itineraries through the eastern part of the region should be fostered (A46 and A432, see map below).

¹² Panorama 2019, CORALY -Coordination et Régulation du Trafic de l'Agglomération Lyonnaise (DIRCE, MDL, APRR, AREA, ASF).

¹³ Schéma de cohérence territoriale, Syndicat mixte d'études et de programmation de l'agglomération Lyonnaise, 2017

¹⁴ Evolution du réseau routier structurant de l'agglomération lyonnaise, Réunion d'échanges avec les élus des territoires concernés, DREAL Auvergne-Rhône Alpes, 2018

As for local traffic, the previous decades of promoting road infrastructure-led development still impact mobility patterns in the Lyon wider region. The private car remains the most frequent transport mode in the metropolitan area and totals approximately 71% of journeys¹⁵. According to the 2017 Urban Structure Plan, three journeys out of four on regional highways are of local origin and destination. The eastern ring-road, boulevard Laurent Bonnevey, is Lyon's most popular axis. It totals 155,000 vehicles per day, 95% of which are local journeys.

Within the Métropole de Lyon, the modal share for cars is lower (44%), as it benefits from a denser public transport system (metro, trams and buses). The use of cars has decreased by 10% since 1995¹⁶. For soft modes, walking is popular (34%) but cycling only attracts 2% of users. In Lyon and Villeurbanne, the heart of the metropolitan area, car-use is significantly lower (26%), for the benefit of alternative modes, mainly walking (45%).

The 2017 Sustainable Urban Mobility Plan¹⁷ (*Plan des déplacements urbains*) points out five main challenges regarding mobility and urban development for the forthcoming decades in Lyon:

- A demographic growth, sustained by a flourishing economic development. Between 2007 and 2017, population has increased by 10%¹⁸ and keeps on growing, which foreshadows a more important demand for transport infrastructure capacity;
- A growing disconnection between residential and work areas. This is especially true for people living in suburban cities, where only one third of the inhabitants work in the same area that they live in. This disconnection leads to an increase in daily commuting journeys;
- An expansion of Lyon's area of influence. More and more people working in Lyon's metropolitan area live beyond the metropolitan boundaries, meaning an increase in the average travelled distance. This situation concerns one fourth of jobs located in the metropolitan area, that is to say 710,000 people;
- Socio-spatial inequalities. In socially-deprived cities in the south (Pierre-Bénite, Givors, Saint-Fons) and in the east of the metropolitan area (Vénissieux, Vaulx-en-Velin, Rillieux-la-Pape), inhabitants are less likely to own a car. They are more dependent on public transport, which weakly serves these cities. Improving public transport accessibility for all is essential.
- Air pollution and frequent pollution peak episodes. The important traffic volumes going through the Lyon region everyday create health issues for local residents. Approximately 250,000 inhabitants in Lyon and Villeurbanne are frequently exposed to high pollution levels.



Modal split in the Métropole de Lyon (City-Region) and in the core cities (Lyon and Villeurbanne), 2015

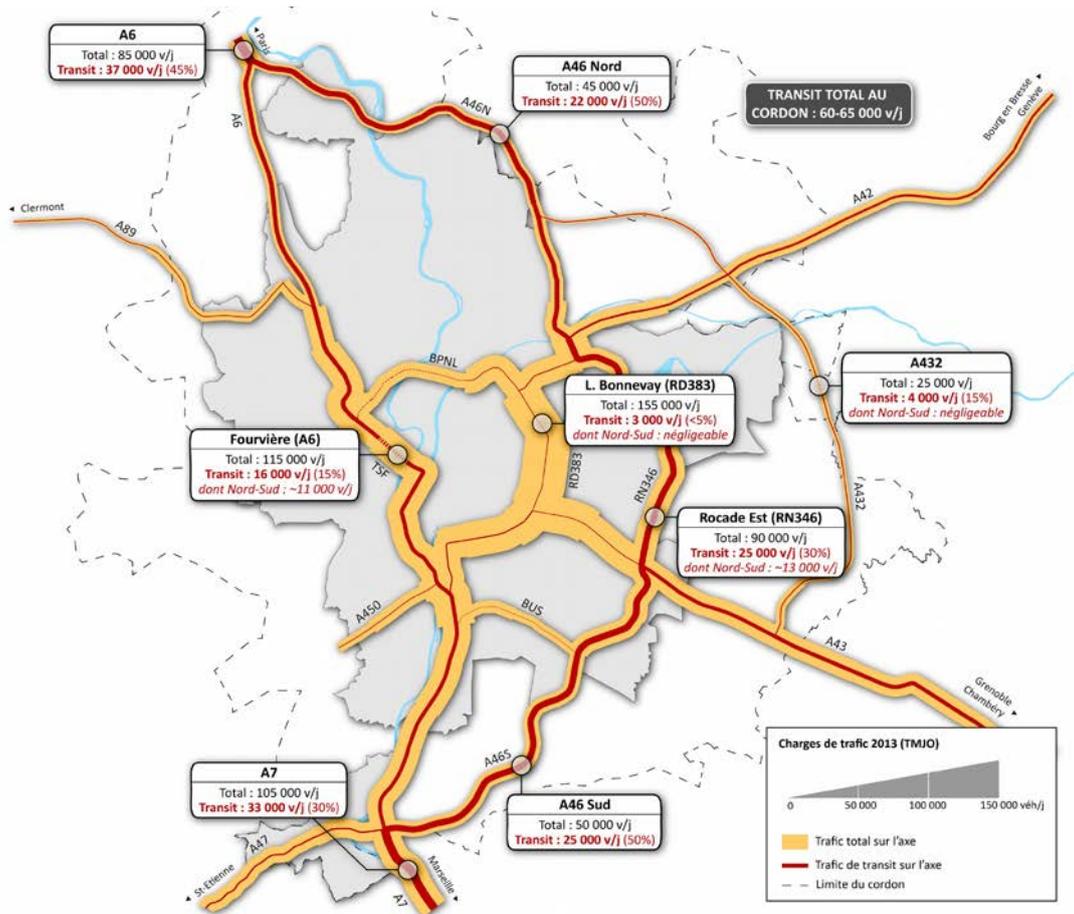
© SYTRAL, UrbaLyon

¹⁵ Plan de déplacements urbains de l'agglomération lyonnaise, Syndicat mixte des transports pour le Rhône et l'agglomération lyonnaise, 2017

¹⁶ Ibid.

¹⁷ Ibid.

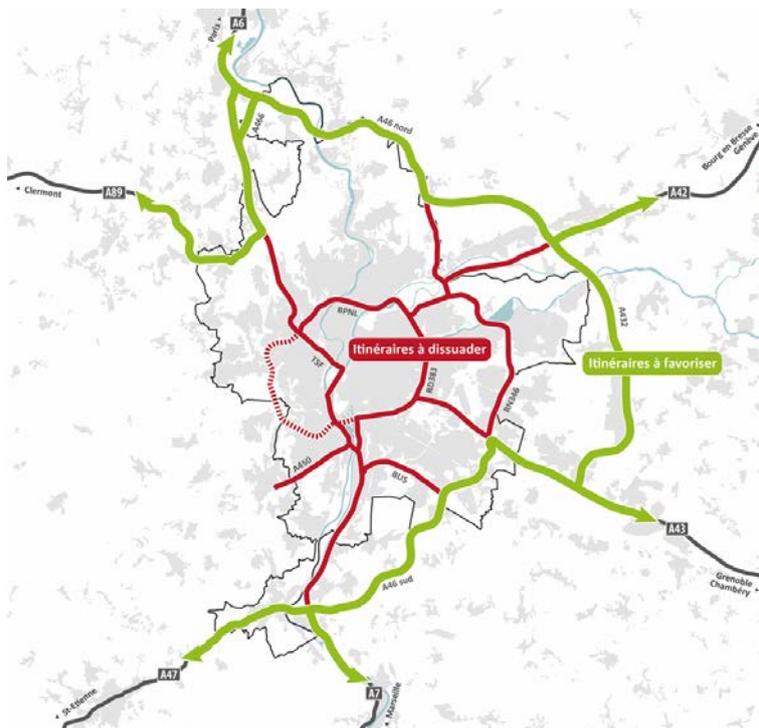
¹⁸ « Dossier complet – Aire urbaine de Lyon », INSEE, 2020



2013 traffic volumes in the Métropole de Lyon

The A6/A7, the ring-road Laurent Bonnevey and the eastern bypass through A46 count among the most saturated axes

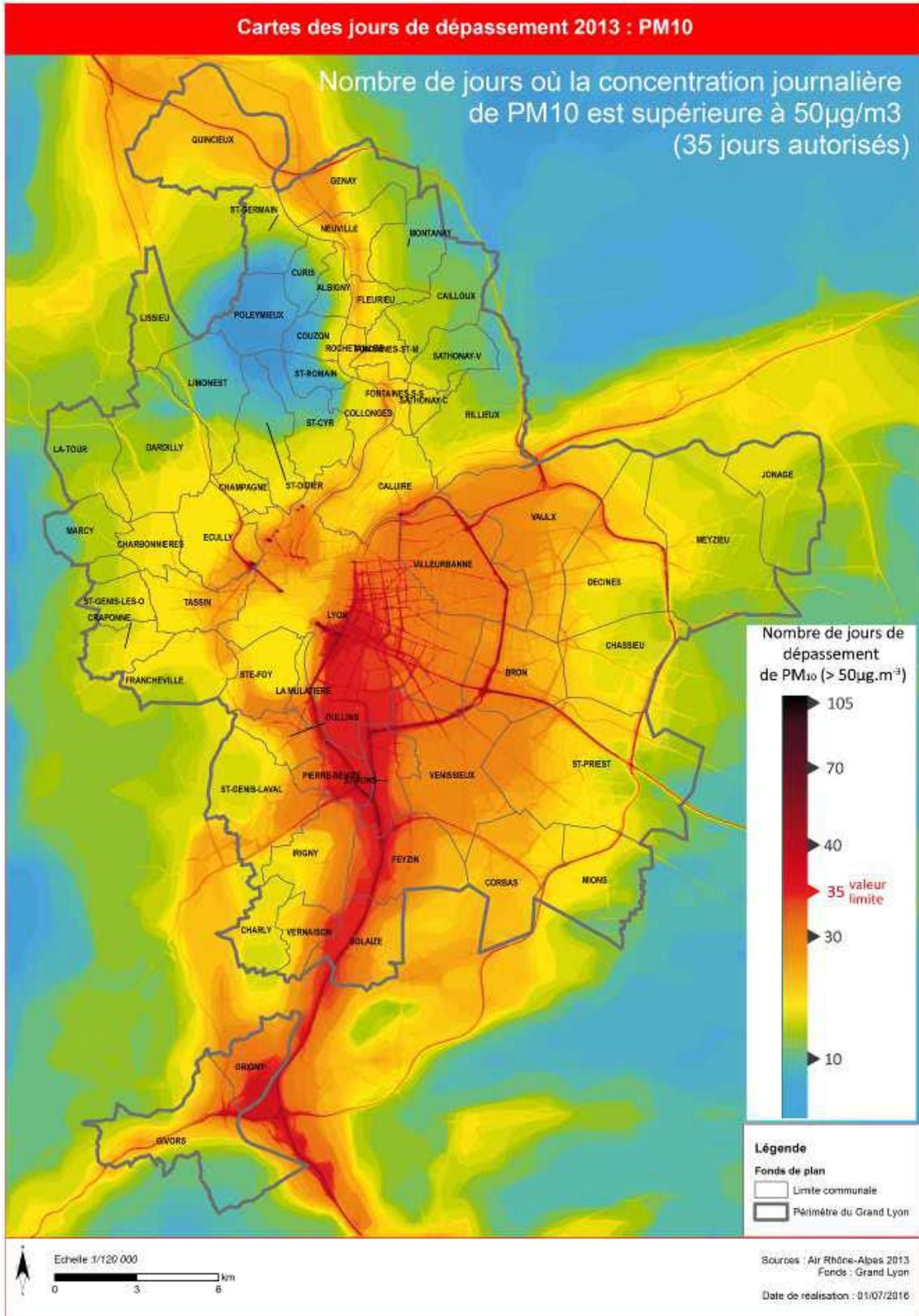
© DREAL Auvergne-Rhône-Alpes, 2018



Management plan of transit traffic in the Lyon region

All long-distance routes passing through the metropolitan area should be avoided (red) with use of bypassing highways encouraged (green)

Source: DREAL Auvergne-Rhône-Alpes, 2018

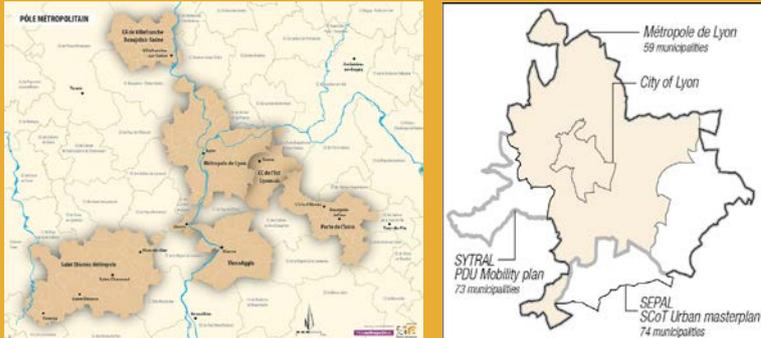


Days with concentration of fine particles (PM10) exceeding regulatory levels in Métropole de Lyon, 2013
 Areas where air pollution concentration is highest include major highway axes, such as A6/A7 axes, and the industrial corridor in the southern part of the metropolitan area, in the Chemistry Valley (*Vallée de la Chimie*)
 © PLU-H Métropole de Lyon, Air Rhône-Alpes, 2013

Governing authorities in Lyon's metropolitan region

Lyon City-Region has a special status in the French governing system. The *Communauté urbaine de Lyon* (intermunicipal authority) was created in 1969 and transformed into the Métropole du Grand Lyon in 2014 with increased powers, as both a metropolitan authority and a county (*département*) –the only one in France. It operates in many fields such as social welfare, economic development, climate, urban planning, etc. The Mobility & Transport Plan is developed by the SYTRAL, the public regional mobility authority combining 73 municipalities.

Joining with two other suburban intercommunalities, the Métropole de Lyon elaborates a strategic long term Metropolitan Structure Plan (*Schéma de cohérence territoriale*) which translates into the legal Urban and Housing Masterplan (PLU-H) of the Grand Lyon.

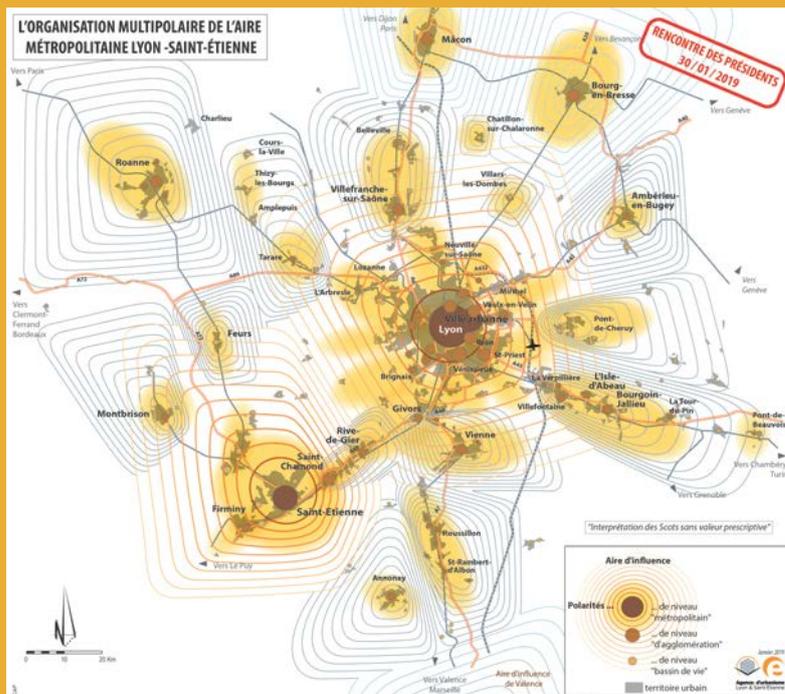


4 areas Pôle Métropolitain (left); Métropole de Lyon, Transport Authority and Metropolitan Masterplan

© UrbaLyon Agence d'urbanisme / L'Institut Paris Region

Lyon has a long experience of intensive cooperation at different scales and on different topics within the wider metropolitan region to mitigate administrative fragmentation. One of these platforms is the inter-Scot (Joint-Masterplanning) where 13 intermunicipal territoires have agreed on a common framework for their masterplans at the scale of a region of 3.4 million people, 12,770 km² and 966 municipalities.

In 2013, Lyon and St-Etienne City-Region authorities, together with other territories, created a Regional Transport Organisation (SMT AML) to manage intermodal transport systems at the scale of a metropolitan area serving 2.6 millions people and 435 municipalities in 4 counties. Further integration exists within the "Pôle métropolitain" (2016), a joint metropolitan network combining 6 territories, including the International airport development areas.



The polycentric wider metropolitan model of the Lyon-Saint-Etienne region

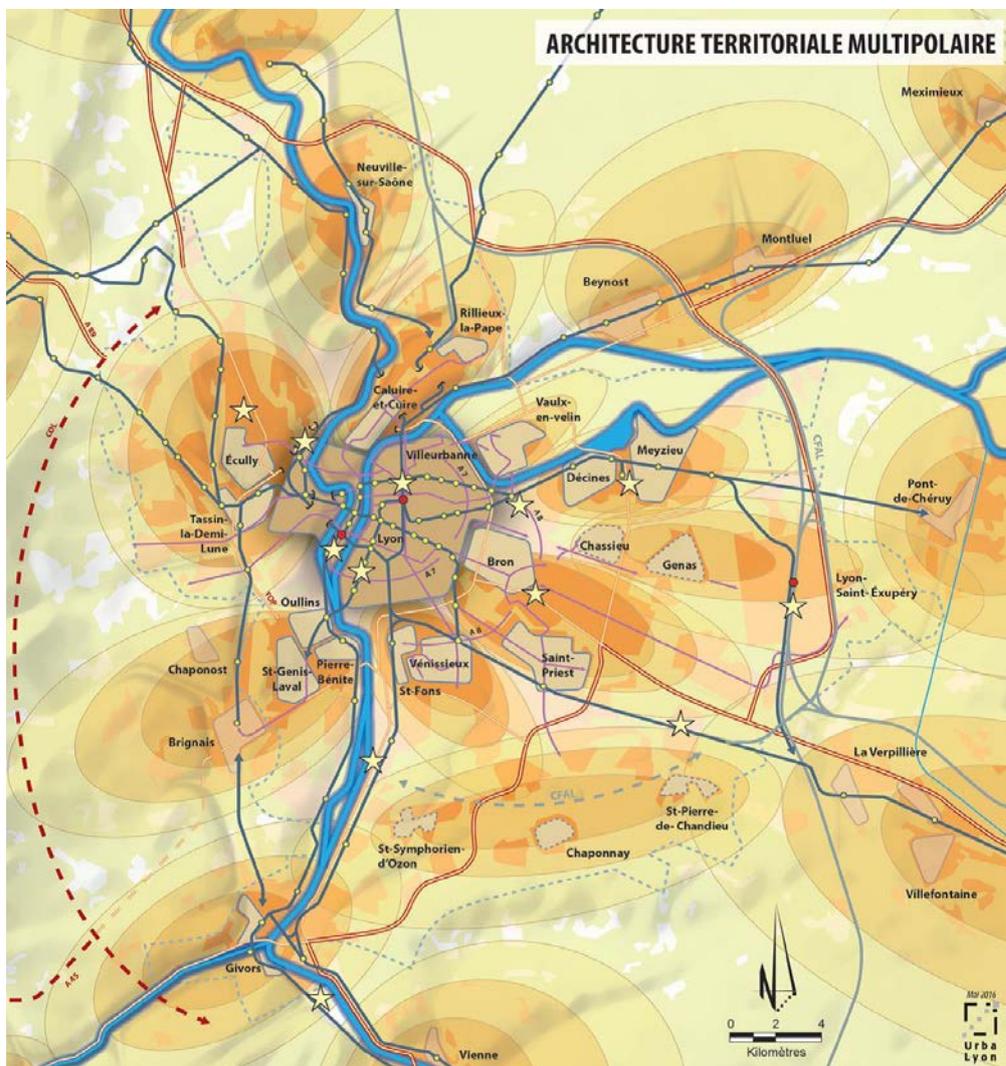
© UrbaLyon and EPURES Planning Agencies for Lyon and St-Etienne City-Regions

2. Urban Development and Mobility Strategies

2.1. Lyon's Current Development Model

After the post-war period of rapid development and urban sprawl, the Grand Lyon decided in the 1990s to restrict the urbanization of green field land by adopting a compact-city development model. The 1999 *Land-Use Plan* (POS), the most ambitious one in France at the time, gathered together 55 municipalities: this allowed a common vision for the City-region and led to the removal of 1,000 hectares in the plan as compared to previous plans¹⁹. Redevelopment in urbanized areas is prioritised, such as the renewal of the area of Confluence in central Lyon (see below).

Urban sprawl progressively stabilises in the 2010s, according to the **Urban and Housing Master Plan** (*Plan local d'urbanisme et du logement*) approved in 2019²⁰. The planning of the City-Region is based on a polycentric model, with Lyon and Villeurbanne as the central core, secondary centres (Bron, Vénissieux) and peripheral economic hubs such as the St-Exupéry Airport area. This polycentric model is supported at wider metropolitan region by a network of cooperations with a string of large and medium towns, including St-Etienne City-Region (see Lyon-St Etienne map p.21).



The polycentric model of Lyon City-Region in the Metropolitan Structure Plan (2017)

This strategic plan supports the transformation of M6/M7 highways into a boulevard

© Lyon Metropolitan Masterplan (SCOT) SEPAL, 2017

¹⁹ DELOHEN Pierre, ALLAIN-DUPRE Elisabeth, Grand Lyon. Un seul POS pour 55 communes, Le Moniteur, December 3rd 1999

²⁰ Rapport de présentation, Plan local d'urbanisme et d'habitat, Grand Lyon Métropole, 2019

2.2. Transport Strategies. Reducing the Impacts of Mobility

2.2.1. Territorial Directive for Lyon's Urban Region (2007)

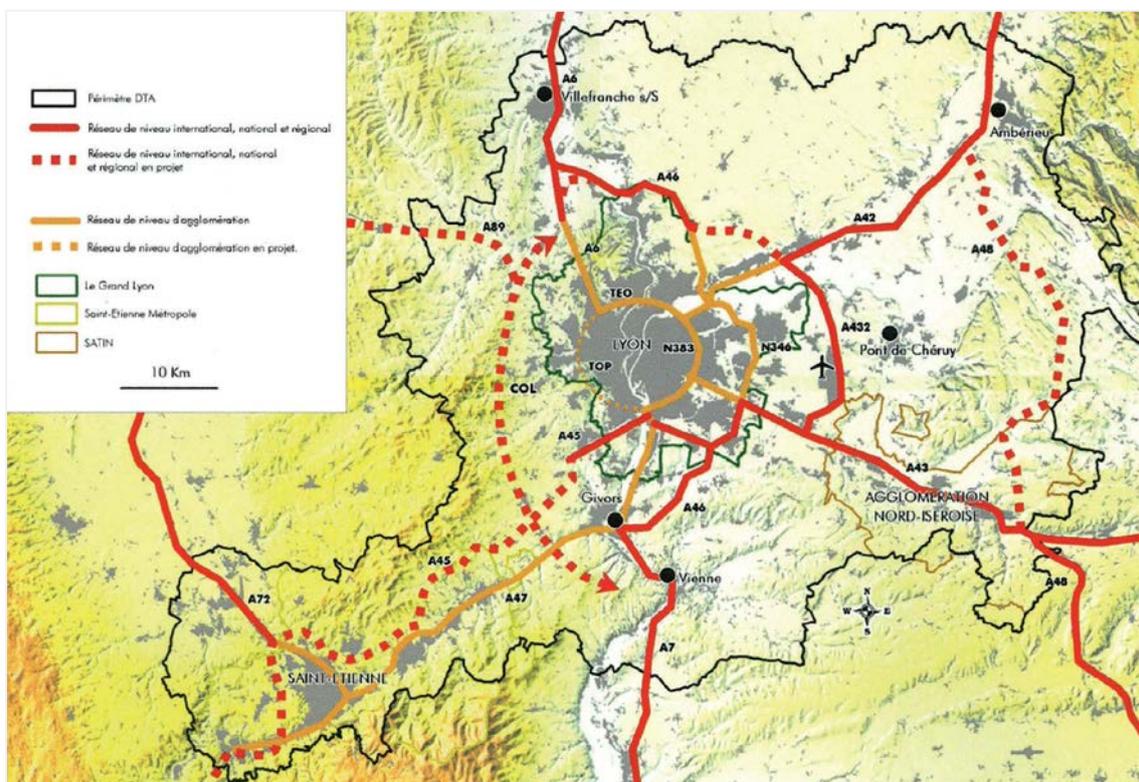
The metropolitan area of Lyon is one of the few areas in France to be subject to a spatial planning directive from the central government, as its development carries national-level issues. These stakes are exposed in the statutory document *Spatial Directions for the Development of Lyon's Urban Region* (*Directive territoriale d'aménagement de l'aire métropolitaine Lyonnaise*), approved in 2007.

The *Directive* gives orientations regarding transport infrastructure in the Lyon region, combining needs for economic activities and a more sustainable mobility system. This translates into the construction of new highways in order to ensure a fluid traffic and accessibility to economic centres; and an optimisation of the existing road network in the dense metropolitan core.

Among the new highways decided in the 2007 *Directive* are two western bypasses, an innercity metropolitan ring (identified as 'TOP' on map below) and an outercity national bypass ('COL' on the map) to complete the existing eastern ring-roads, Boulevard Laurent Bonnevey and A46. The *Directive* also recommends the construction of the A89, linking Lyon to Bordeaux, the completion of the eastern bypass through the A432, the A45 towards Saint-Etienne and the A48 eastwards between Ambérieu-en-Bugey and Bourgoin-Jallieu.

Two of these projects have been completed, A432 in 2011 and A89 in 2016, but the others have been abandoned since, often due to local opposition from city officials and inhabitants.

As for the optimisation of the existing system, the *Directive* insists on the enhancement of public transport's attractiveness over individual cars and the promotion of a modal shift towards rail and waterways for goods transportation.



Road network in the metropolitan area of Lyon and Saint-Etienne and its projected evolutions in 2007

Most of the road construction projects, including the western highway bypass (COL) and recently the western ring road (TOP), identified by the central government and metropolitan authorities in 2007 have been abandoned since then, except for the completion of the eastern bypass A432 and the A89 highway to Bordeaux.

© *Directive territoriale d'aménagement de l'aire métropolitaine Lyonnaise*, DREAL Auvergne-Rhône Alpes, 2007

About existing infrastructure, the national directive points out three main topics: limiting the capacity of penetrating road axes in the city of Lyon, hindering the creation of new highway interchanges and avoiding the promotion of free-of-charge highways.

This 2007 Directive was very infrastructure-oriented, since it saw the construction of new highways as an efficient way to keep traffic fluid. Recommendations regarding the urban integration of highways only targeted the city of Lyon, though the dense metropolitan centre extends beyond Lyon's city limits. As a national-level directive, planning documents of lower governing levels should be compatible with given orientations.

2.2.2. The 2017 Metropolitan Structure Plan

In line with the previous Plan from 2010, this strategic plan approved in 2017 targets a better integration of urban highways in the metropolitan area. Major axes that could benefit from pacification and urban integration are pointed out:

- A6/A7 highways
- D383 Ring-road Laurent Bonnevey
- A43 at the south-eastern city entrance
- A47 crossing the city of Givors, in the southern part of the metropolitan area

Through an improvement of their integration, the metropolitan authority ambitions to reduce noise disturbance and pollution levels, especially in areas where the concentration of fine particles often exceeds regulatory levels. This mainly affects the surroundings of high-traffic roads and the southern corridor of the metropolis where the industrial Chemistry Valley (*Vallée de la Chimie*) is located. Recommended measures include a progressive speed reduction on major axes and the reallocation of spaces gained from car use for alternative modes (public transport, cycling and walking).

2.2.3. The 2017 Sustainable Urban Mobility Plan for 2030

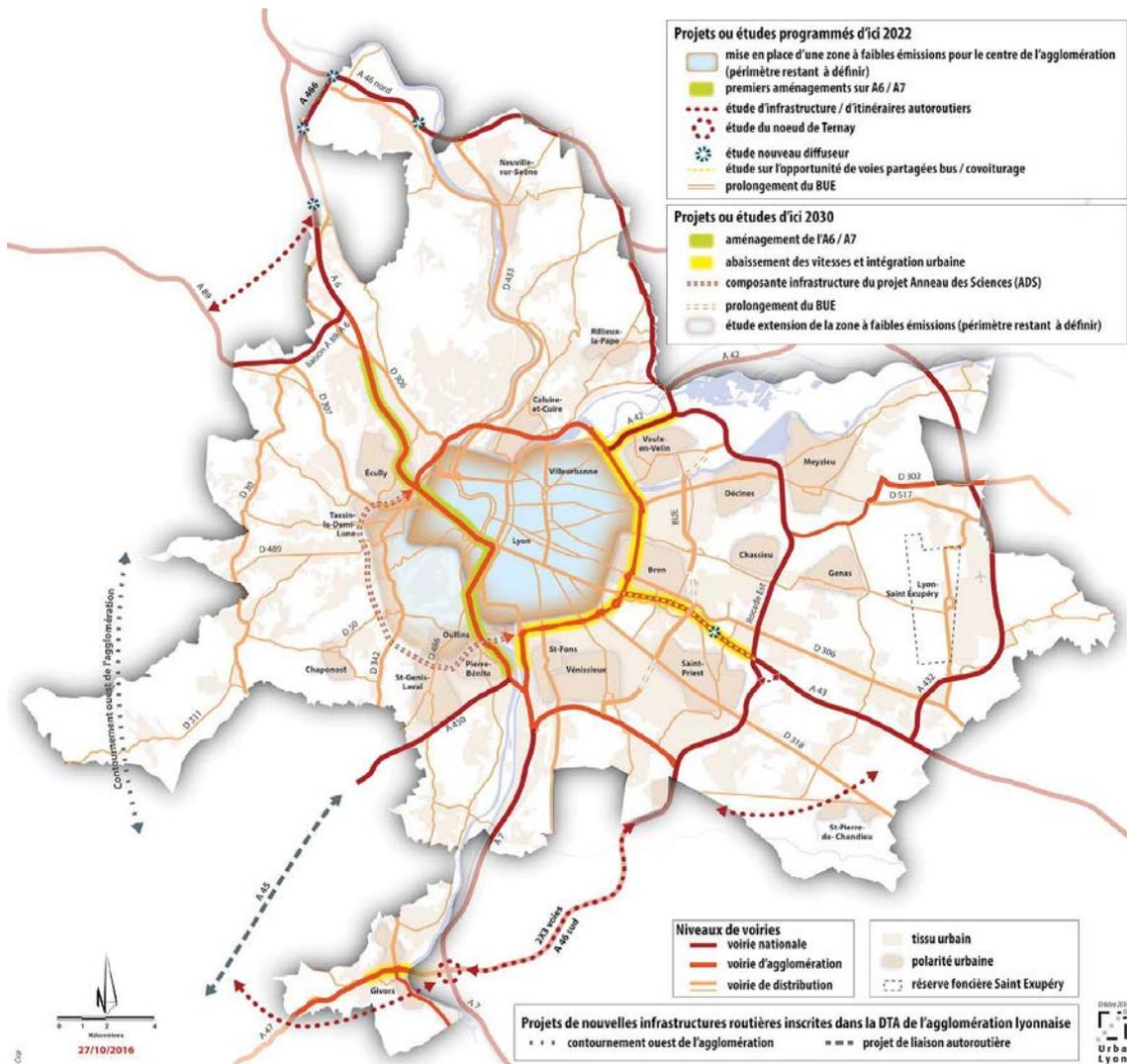
The Sustainable Urban Mobility Plan (Plan de déplacement 2030; SUMP) defines guiding measures for the development of the public transport system, the promotion of soft modes, and the regulation of car traffic and heavy goods transport. The SUMP expresses objectives to achieve by 2030 for the use of motorised vehicles and their impact in the Lyon region:

- A 35% decrease of greenhouse gas emissions caused by heavy goods traffic, as compared to the 2005 level
- At least a 5% reduction of distances travelled by private cars and lorries, as compared to the 2015 level
- A modal split composed of (*versus* 2015 level in brackets):
 - 35% for cars and two-wheeled vehicles (*versus* 44%)
 - 35% for walking (*versus* 34%)
 - 22% for public transport (*versus* 20%)
 - 8% for cycling (*versus* 2%)

To cater for the projected modal report from cars to public transport, Métropole de Lyon decided of a €1 billion budget for the 2017-2022 period to be invested in the improvement of the network and its accessibility.

The creation of a *Low-Emission Zone* in the metropolitan centre – Lyon, Caluire-et-Cuire, and neighbouring districts in Villeurbanne, Bron and Vénissieux – is also stated. Its aim is to improve air quality in the most populated area by regulating the circulation of heavy-duty vehicles and light utility vehicles. The Low-Emission Zone was adopted in January 2020.

In accordance to the national 2007 *Directive for Lyon's Urban Region*, the 2017 Sustainable Urban Mobility Plan 2030 provides for the development of new roads infrastructure, including the western bypass known as *Anneau des Sciences* (now abandoned; see below). Building new highways may be contradictory with the ambition of reducing car use and its environmental impact in Lyon. In effect, the opening of three new highways (A89, A466 and A432) has resulted in an increase of traffic volumes on highways north of Lyon by 10% to 60% between 2018 and 2019 (CORALY 2019).



Road network in the metropolitan area of Lyon and its potential evolutions (2016)

The map shows road infrastructure projects at the time (dotted lines), including Western Bypass (*Anneau des Sciences*) cancelled in 2020. Existing road infrastructure that could benefit from speed reduction and urban integration (yellow and green), including A6/A7. Low-emission zone (blue) in the metropolitan centre was adopted in January 2020.

© Sustainable Urban Mobility Plan (*Plan des déplacements urbains*), SYTRAL, 2017



The M7 in the centre of Lyon before it enters the Fourvière tunnel

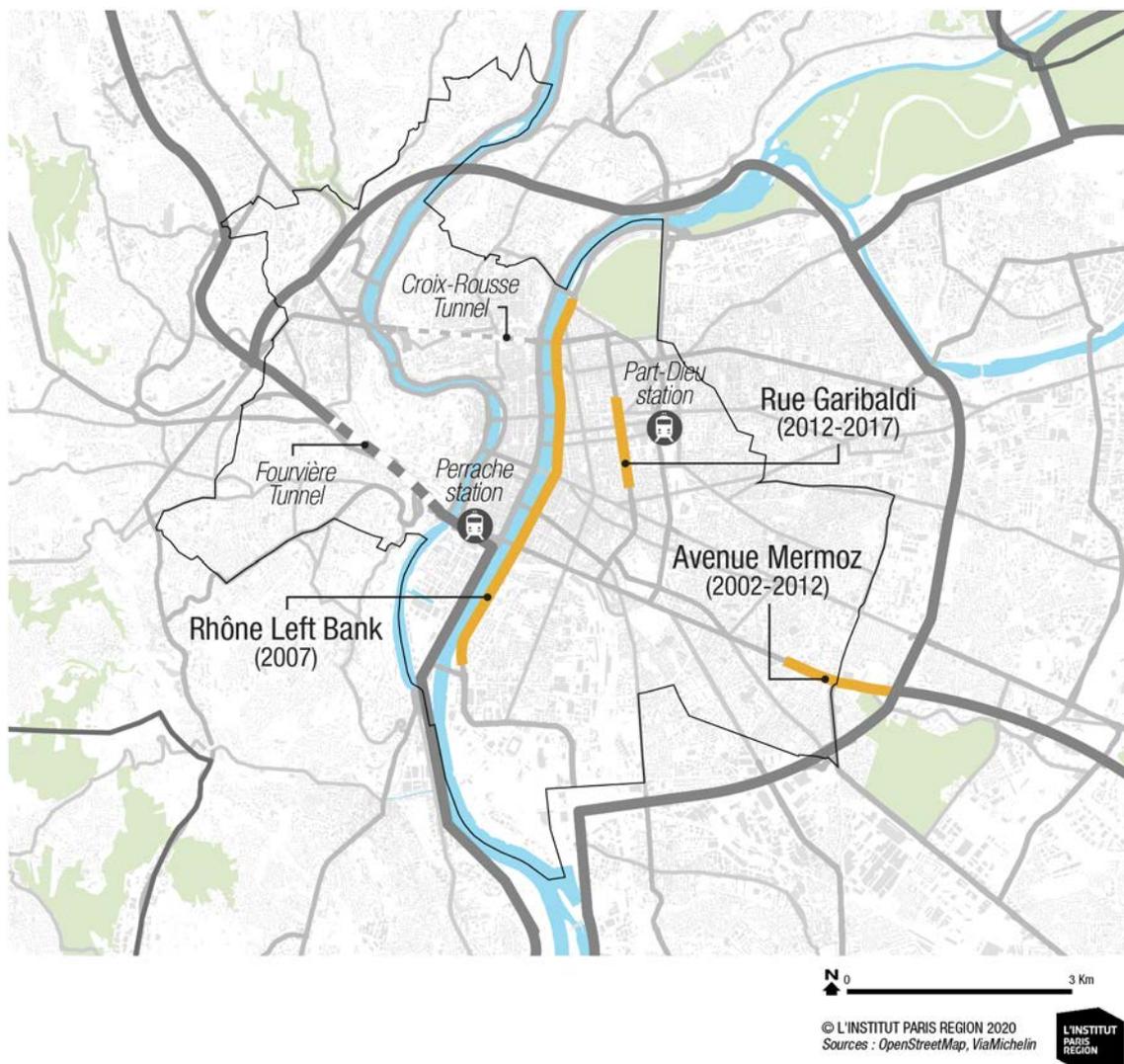
© Paul Lecroart, L'Institut Paris Region

2.3. From Roads to Streets: The Lyon Experience

Since the 2000s, the city of Lyon has engaged a car reduction policy, to increase walkability and public space quality. This ambition is translated into public space redesign projects and pacification of high-traffic roads. Three main projects have been met with success:

- the transformation of the Rhône's left bank from parking lots to a promenade and a park,
- the demolition of the A43 viaduct on Avenue Mermoz and the creation of an urban boulevard,
- the pacification of the Rue Garibaldi in Lyon's central business district

In all three cases, the transformation increased access for alternatives modes of transport and public space quality. It also improved quality of life and street greening in the concerned neighbourhoods and was integrated in a regeneration of the whole area.



Three Roads-to-Streets transformation projects delivered in Lyon since 2007 (in orange)
Rhône River banks pedestrianisation, A43 highway flyover removal, Rue Garibaldi Boulevard

2.3.1. Rhône's Left Bank Linear Park (2007)

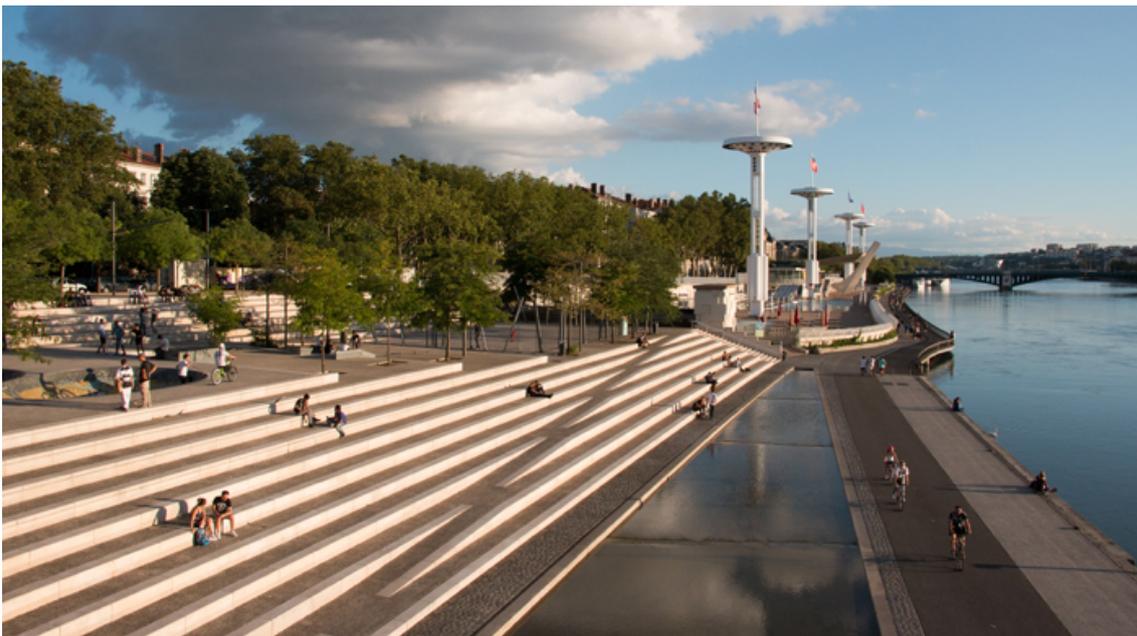
The Rhône's left bank was a major transformation project targeting the reduction of spaces dedicated to the car in Lyon. Since the 1950s, the left bank of the river had been used as a parking lot, with silo car-parks for 16,000 cars. The *Blue Plan* approved in the early 1990s was a first step towards a reconnection of the city with the river.

A public consultation was launched in 2002 to design the brief for the transformation project. The new Rhône bank, stretching on 5 km across the city with a surface of 10 hectare, was inaugurated in 2007. It now serves many functions: park, promenade, barge harbour, playground, open air swimming pool... A continuous pedestrian pathway and a cycle track were built, connecting the Tête d'Or Park in the north to the Gerland Park in the south, two of Lyon's major green spaces. Two underground parking lots were to compensate for the removal of parking spaces. The project cost in total €30 million. It contributes to giving back riverfront access to Lyon's inhabitants and improve its attractiveness.



The open air swimming-pool on the left bank of the Rhône banks after removal of the parking silos

© Paul Lecroart, L'Institut Paris Region



The park on the Rhône's left bank, reconnecting the city to the riverfront

© City of Lyon, Sébastien Fanger

2.3.2. The A43 Highway Flyover Removal Avenue Mermoz (2012)

At the south-eastern city entrance used to be a 1.2 km long viaduct connecting the A43 penetrating highway to the Avenue Jean Mermoz. The A43 links Lyon to the Alpine cities of Chambéry and Grenoble and had an important traffic charge that could reach up to 85,000 vehicles per day. It used to generate disturbances for the adjacent neighbourhood, mostly composed of social housing.

From 2002 to 2012, the Métropole de Lyon undertook the demolition of the A43 flyover and the pacification of Avenue Mermoz. With the demolition and the change of status came a new design: cycling and bus lanes, larger sidewalks, reduced car space, for a total cost of €21 million. The transformation of the infrastructure allowed a regeneration of the social neighbourhood. The area is receiving important investments to upgrade public space, build more housing units, modernize a shopping mall, and create more commercial space. The regeneration process is ongoing since 2007.

Avenue Mermoz creates a precedent for later projects in Lyon, by proving it is possible to transform a major road infrastructure and reduce car use without creating more congestion. Research shows a traffic evaporation of 15% compared to the initial situation²¹. The 2017 Metropolitan Structure Plan points out the potential further transformation of the A43 highway.



Avenue Mermoz, after the demolition of the A43 viaduct, is now a pacified urban boulevard

© Gautier Conquet / Fabian Da Costa

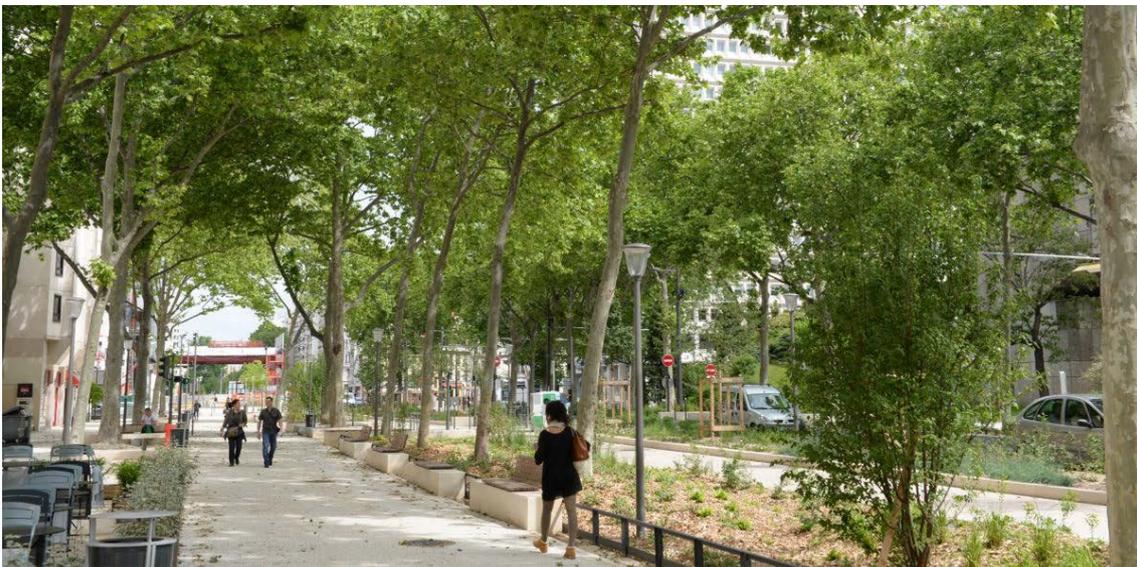
2.3.3. Urban Transformation Rue Garibaldi (2012 – ongoing)

This 3.8 km long axis is one of Lyon's longest streets and central arteries, going from the north to the south of the city centre. It crosses La Part-Dieu, Lyon's central business district. Rue Garibaldi was converted into a hybrid express boulevard in the 1960s to cater for more car traffic. It used to be a one-way street, with up to five lanes. There were few traffic light with underpasses at most crossstreets for to keep traffic moving. Daily traffic volumes could reach 30,000 vehicles. Rue Garibaldi used to be an important north-south barrier in the city, difficult to cross and unsafe for pedestrians.

²¹ Yves CROZET, Aurélie MERCIER. Induction et évaporation de trafic : revue de la littérature et études de cas. [Rapport de recherche] laboratoire Aménagement Economie Transports – LAET (UMR 5593); Métropole de Lyon, 2016, pp.47.

The transformation of Rue Garibaldi began in 2012. The aim was to tear down the barrier by reconnecting the road to the neighbourhoods. Pedestrian bridges and three (out of five) road underpasses have been removed and backfilled to reconnect with the perpendicular streets. Space allocated to cars is reduced to three lanes, with a dedicated two-way bus lane and a two-way bike lane. Sidewalks have been enlarged, allowing restaurants to offer outdoor terraces. The street has also made greener thanks to vegetation strips that protect cyclists and pedestrians from motor vehicles, provide shade and take care of rain water. A first transformed section was completed in 2016, followed by a second one in 2017. The project cost €32 million in total. So far, 1.2 km of Rue Garibaldi has been pacified, and a third section is currently underway.

The transformation of Rue Garibaldi is part of the ambitious urban redesigning and intensification of La Part-Dieu CBD, clarifying the status of urban spaces formerly devoted to car-use. The area is undergoing a comprehensive uplift to strengthen its economic attractiveness²², improve liveability through better public spaces and services, and promote more sustainable transport modes. Rue Garibaldi's new design welcoming new uses of urban space.



Rue Garibaldi after the removal of its expressway-like features. Green sidewalks welcome outdoor uses
© SPL Lyon-Part Dieu (top); P. Lecroart, L'Institut Paris Region (bottom)

²² La Part-Dieu is France's second central business district, after Paris-La Défense



**From top to bottom: After (left) / Before (right):
Rhône banks in 1989 and in 2019**

© Urbalyon, Antoine Merlet

Avenue Mermoz redesigned after the demolition of the flyover

© UrbaLyon, Fabian da Costa / Gautier Conquet

The new design of rue Garibaldi, dedicating more space to pedestrians, cyclists and bus commuters

© Passagers des villes

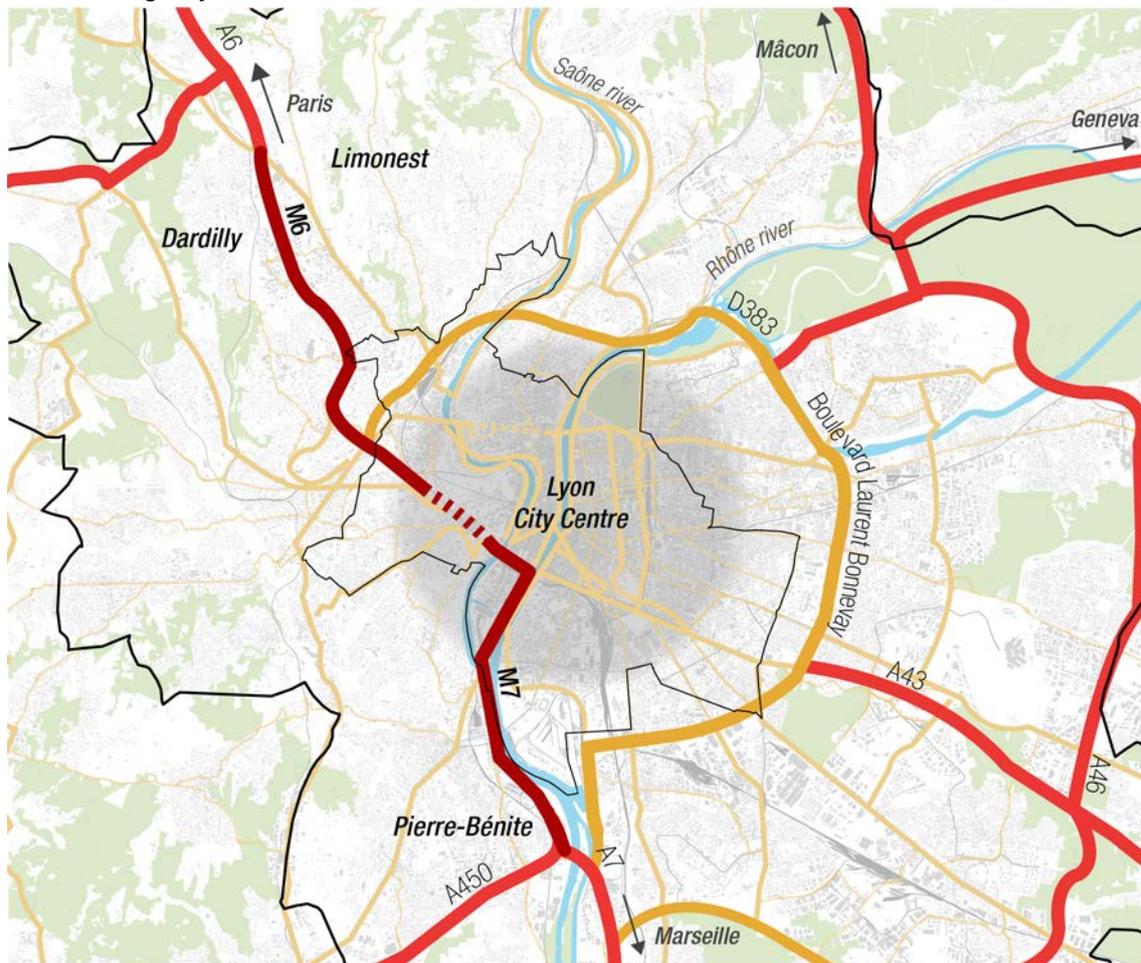
3. Transforming the M6/M7 Highway Corridor

The M6/M7 corridor is Lyon's second most important road axis (over 120,000 vehicles per day). The debate about its transformation into a metropolitan avenue dates back to the 2000s. The discussion carries issues related to noise disturbance, frequent air pollution peaks and a poor urban integration. The M6/M7 project was initially presented as complementary to the construction of the *Anneau des Sciences* (*Science Ring*), a western bypass highway, meant to deflect traffic from the city centre.

The approach adopted by the Métropole de Lyon is progressive, with incremental steps towards a complete transformation, initially targeted for the year 2030. The decommissioning of A6/A7 from national highway to M6/M7 metropolitan highway in 2016 was a strong signal of the authorities' will to turn the page on car-oriented urban planning. Among the first changes are landscaping works along the roads and experimentation on new forms of mobility (carpooling, P+R, express bus).

The year 2020 marks a milestone for the M6/M7 project with the cancellation of the Science Ring project. This announcement is an upheaval for the future of M6/M7, as the strategy has to be adapted to a situation without a relief highway. How to achieve a deep transformation of mobility patterns without a new road infrastructure?

The M6/M7 Highway Corridor

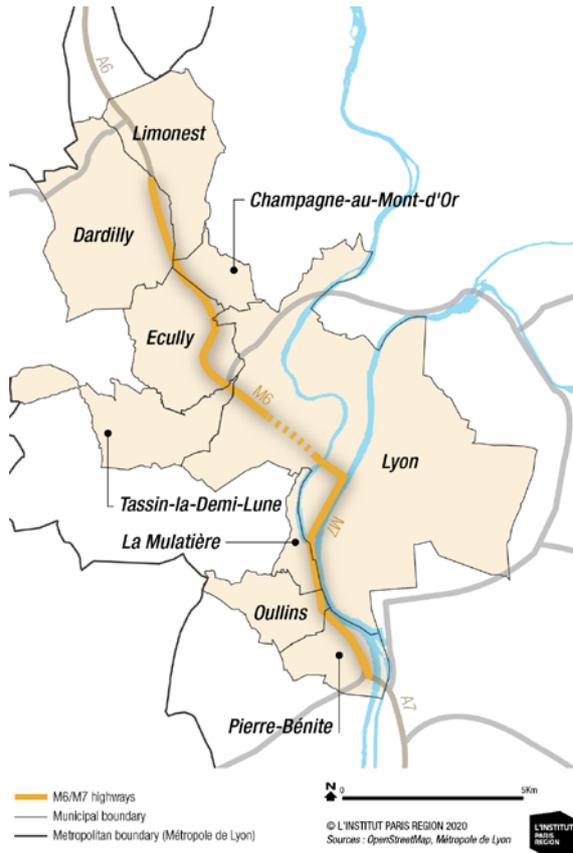


- Highways
- Expressways
- Axis subject to transformation (M6-M7)
- Municipal boundary (City of Lyon)
- Metropolitan boundary (Métropole de Lyon)
- City centre

N 0 5Km

© L'INSTITUT PARIS REGION 2020
Sources : OpenStreetMap, ViaMichelin,
Métropole de Lyon



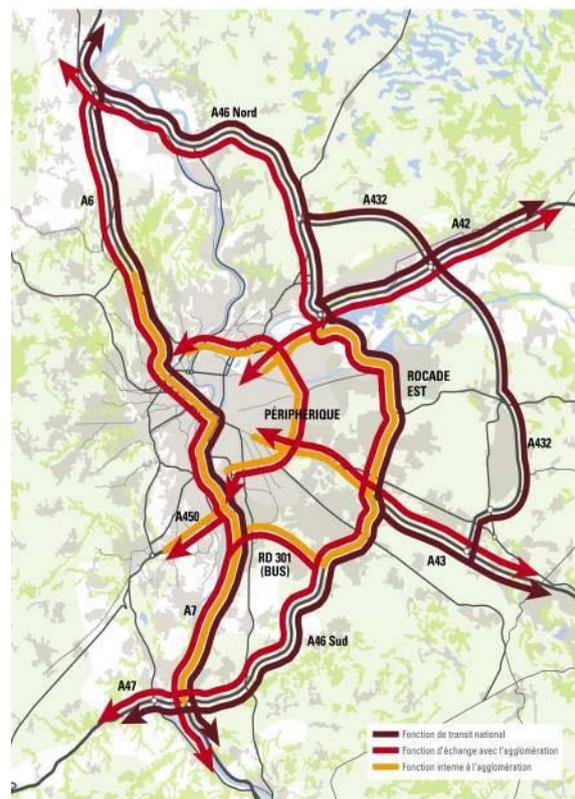


Strategic importance of the M6/M7 Project in Lyon.
 The 16 km M6/M7 stretch to be transformed is significant metropolitan project as it crosses 9 municipalities of the City-Region from north to south.

Traffic functions of highways in the metropolitan area of Lyon

The M6/M7 axis serves 3 functions: long distance, metropolitan and local
 Brown = long distance traffic
 Red = metropolitan traffic
 Orange = local traffic

© Métropole de Lyon / Département du Rhône



3.1. The M6/M7 Highway and its Urban Environment Today

3.1.1. A Cross-City Motorway



Traffic jam on M7 highway, on the Rhône hard bank of the central peninsula

This heavy-traffic road deprives Lyon's inhabitants of their riverfront

© Paul Lecroart, *L'Institut Paris Region*, 2017

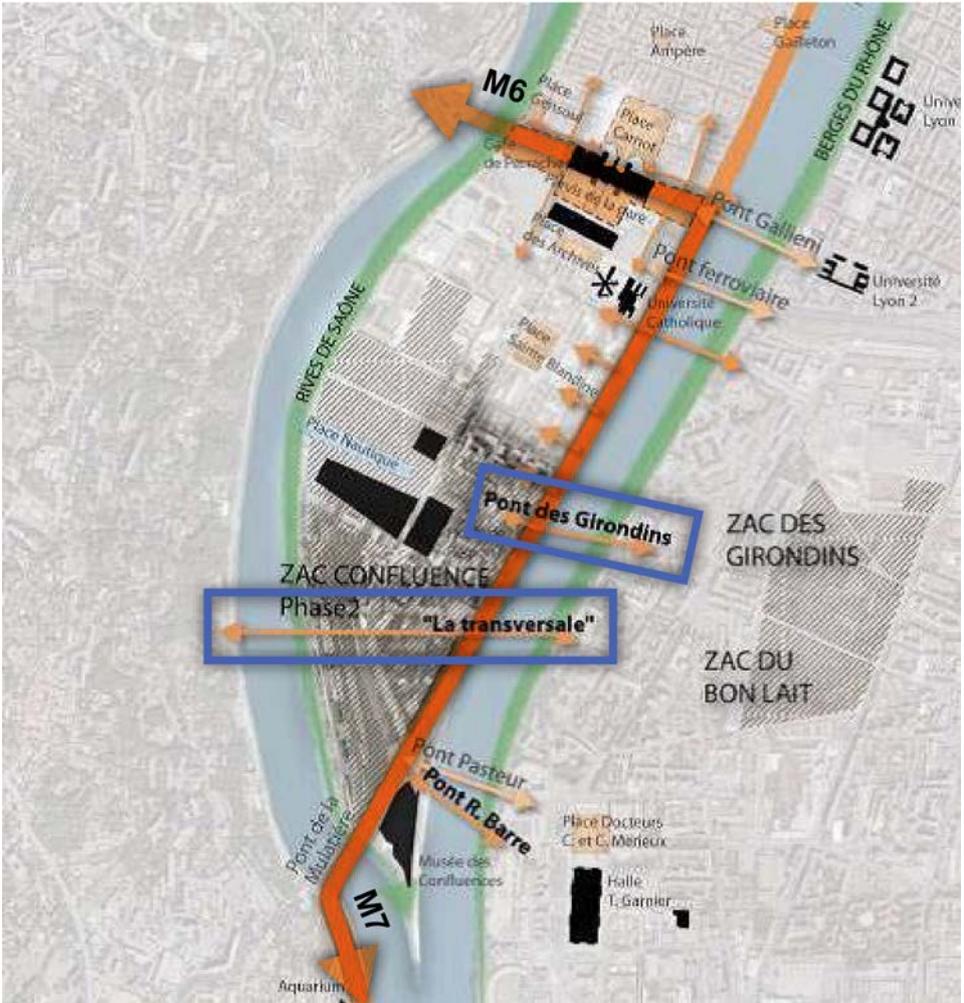
The section targeted by the transformation project is 16 km long, from La Garde interchange to the A7/A450 interchange (map below). It crosses nine municipalities, from north to south: Limonest, Dardilly, Champagne-au-Mont-d'Or, Ecully, Tassin-la-Demi-Lune, Lyon, La Mulatière, Oullins and Pierre-Bénite. The profile of these cities is very different from one another, from wealthy suburbs like Limonest and Dardilly, in the north, to socially-deprived areas in La Duchère (Lyon), La Mulatière, Oullins and Pierre-Bénite, in the south.

The M6/M7 is 2x3 lanes (6 lane) wide in central Lyon, with a hard shoulder on each side outside the city centre, reaching up to 50 metres wide on some sections. On the stretch impacted by the transformation, the highway has eight interchanges and six half-interchanges. To cross the hills, the M6 is buried for 1.8 km in the Fourvière Tunnel, where the road narrows to four lanes. Both highways join on Lyon's central peninsula, under the Perrache intermodal station. The M7 then borders the Rhône banks southwards for 5 km, along the peninsula and in the more industrial environment of the Chemistry Valley. On this section, the highway cuts away the riverfront, hindering any possible pedestrian connection to the water.

Today, the M6/M7 serves three functions: local and regional access to city centre, city centre eastern bypass, and long distance traffic for national and international journeys (about 15% of traffic volumes). The road is often congested, especially at three nerve points: in the Fourvière Tunnel, under Perrache intermodal station, and on the bridge to La Mulatière in the south. Métropole de Lyon estimates that 30,000 inhabitants live less than 300 metres from this infrastructure, and thus suffer from associated health problems and physical barriers in their neighbourhoods²³. In light of this situation, the M6/M7 as an urban highway is often criticised, both by inhabitants and local officials. The axis is described as an "urban, ecological and health scandal" or even as a "historic mistake"²⁴ to be corrected.

²³ Rapport de présentation, Plan local d'urbanisme et d'habitat, Métropole de Lyon, 2019

²⁴ Compte-rendu du débat public Anneau des Sciences Tronçon Ouest Périphérique de Lyon, Commission Nationale du Débat Public 2013



Road infrastructure in the Confluence peninsula: urban barriers and future links
 Three bridges are under study to give access to/from the mainland. M6/M7 and Perrache are physical barriers.
 © Métropole de Lyon, modified by L'Institut Paris Region



Future footbridges over the M7 highway and river. 2015 Masterplan (north is to the right)
 © SPL Lyon Confluence

3.1.2. The Confluence Urban Regeneration Project

The southern part of Lyon's peninsula has been an industrial and logistic zone until the 1990s. The severance of this area from the rest of the city centre dates back to the 19th century, when the Perrache railway station was built and divided the peninsula in two: a residential and wealthy neighbourhood in the north and a city-fringe with unwelcoming functions in the south (factories, prison, warehouses). The separation was accentuated in the 1970s when the A7 highway was built along the Rhône bank.

In the 1990s, former mayor Raymond Barre saw in the southern peninsula the project that would “*bring Lyon in the third millennium*”²⁵. The location is strategic, at the heart of the city centre, with exceptional landscape qualities, where the Saône and the Rhône rivers meet. Confluence's regeneration project is envisioned as an important driver of the metropolitan development on a 150 hectare site. By 2030, the area should welcome 25,000 inhabitants and 22,000 jobs. This new high end eco-district is designed for mix of land-uses, such as offices, shops, leisure, art galleries, museums, housing with green space along the Saône banks.

Confluence's regeneration is carried out by SPL Lyon Confluence, a public developer created in 1999 for the project. The reconnection of the southern peninsula with the city is progressive since its beginning in 2003. In 2005, a first tramway extension allowed for public transport accessibility of the area. A second extension was inaugurated in 2014, linking to the eastern mainland with the building of a tramway, bike and pedestrian bridge. The Confluence Museum, an important cultural facility at the tip of the peninsula, opened to the public that same year.

The transformation of the southern peninsula into a liveable neighbourhood is embedded in a larger reflection on car-free living and infrastructure in central Lyon. The 2015 Confluence Masterplan draws up the construction of four new bridges: one on the Saône and three others on the Rhône, to give an easier access to the neighbourhood. Two bridges on the eastern side are faced with the issue of crossing over the M7 highway and the river allowing boats to pass underneath.

Giving back the river to the residents of Lyon for civic uses, creating a promenade along the Rhône and restoring the river ecosystem is one of the main challenges facing the Confluence project as regard to the transformation of M7 concrete barrier. The Confluence urban intensification project was one of the catalysts for the pacification of the M6/M7 highway corridor. As a first step, the SPL Lyon Confluence public developer is currently redesigning of the street along the M7 highway.



New residential neighbourhood in Confluence along the new harbour docks in 2014

From an industrial city fringe, Confluence is transforming into a central mixed-use area since the late 1990s.

© P. Lecroart, L'Institut Paris Region, 2014

²⁵ Sylvain GENEVOIS, “La France: des territoires en mutation. Lyon-Confluence, un exemple de rénovation urbaine”, Geoconfluences, July 2005

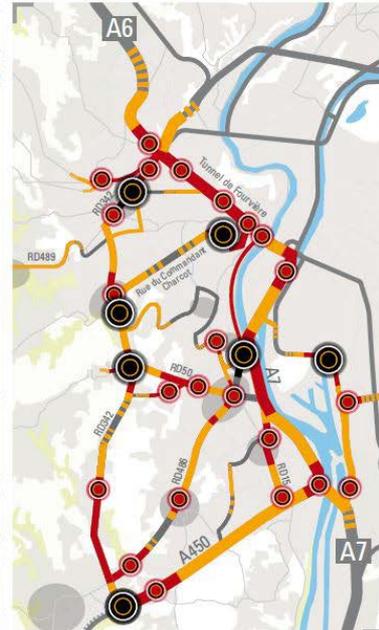
LES CONGESTIONS DU RÉSEAU ROUTIER (SITUATION ACTUELLE) EN HEURE DE POINTE DU SOIR



LES CONGESTIONS DU RÉSEAU ROUTIER EN 2030 (HYPOTHÈSE N°1) EN HEURE DE POINTE DU SOIR



LES CONGESTIONS DU RÉSEAU ROUTIER EN 2030 (HYPOTHÈSE N°2) EN HEURE DE POINTE DU SOIR



Three traffic simulations in Lyon, without the Science Ring project (in 2013)

Current situation (a), development of public transport as planned (b) and reinforcement of public transport with the transformation of A6/A7 into a multimodal city boulevard (c). In all cases, congestion is presented as inevitable and worsens in the absence of a western ring © Métropole de Lyon, 2013



The envisioned route of the Anneau des Sciences in the 2013 Project, mainly underground

Construction of western ring-road was embedded in an intermodal mobility strategy © Métropole de Lyon

3.1.3. Debate over the *Science Ring* Western Ring Project

Since the construction of Lyon's highway network from the 1960s onwards, the idea of completing the eastern ring-road has been brought up many times by different mayors. In the 1990s, under Mayor Raymond Barre, the project was considered but not built. In 2007, the central government wrote down the western ring highway in the national Directive for the Lyon region. At that time, Mayor Gérard Collomb revived the abandoned project of the Western Ring-road (*Tronçon Ouest Périphérique*) and initiated feasibility studies that led to a public consultation in 2012-2013²⁶.

This new western bypass project was named the *Science Ring (Anneau des Sciences)*, referring to the scientific hubs of the metropolis the highway was meant to link together. Carried out by Métropole de Lyon and the Rhône County (*Conseil départemental du Rhône*), this new infrastructure was presented as a way to relieve the existing congested roads and to deflect car traffic from the A6/A7 axis in the city centre to the periphery.

The project's advocates described it as a 14.6 km long "*ecological highway*"²⁷, to be built mostly underground (80%), with 7 interchanges in the western side of the City-Region. During the public consultation in 2012-2013, three scenarios *without* the construction of a new infrastructure were presented. They were based on the projected traffic in 2030 and only relying on improvements in public transport (including the development of carpooling):

- Scenario 1: development of the public transport system, as planned in strategic plans;
- Scenario 2: development of the public transport system and transformation of the (then) A6/A7 into a multimodal urban boulevard
- Scenario 3: reinforced development of the public transport system, going further than the strategic documents, especially regarding rail infrastructure

The conclusion was that none of the three scenarios would be able to cater for the increase in traffic demand, due to the complex mix of traffic on A6/A7²⁸. The construction of a western bypass was presented as the only solution to avoid traffic chaos in Lyon.

With a targeted completion for 2030-2035, the *Science Ring* was not only meant to be just a new road project, but the driver for a multimodal strategy for mobility and a metropolitan project that would enhance economic development. Thanks to this western ring-road, mobility in the Lyon region would be reorganised: it would allow the transformation of A6/A7 into a boulevard, the redesign of streets in western Lyon for reduced traffic flows and the development of intermodal facilities (P+R, regional train...).

The public consultation revealed a general agreement on the need for a transformation of A6/A7 highways with a combined development of alternative modes of transport. But the *Science Ring* project was highly criticised, as its necessity was not unanimously acknowledged by all stakeholders. The main opponents were the Green Party, environmental activists and impacted inhabitants. They criticised the *Science Ring* as an obsolete project that would not solve the issue of traffic but would only move it further to the periphery. They pointed out the fact that it would be an important source of pollution, urban sprawl and a costly project – estimated around €3 to 4 billion.

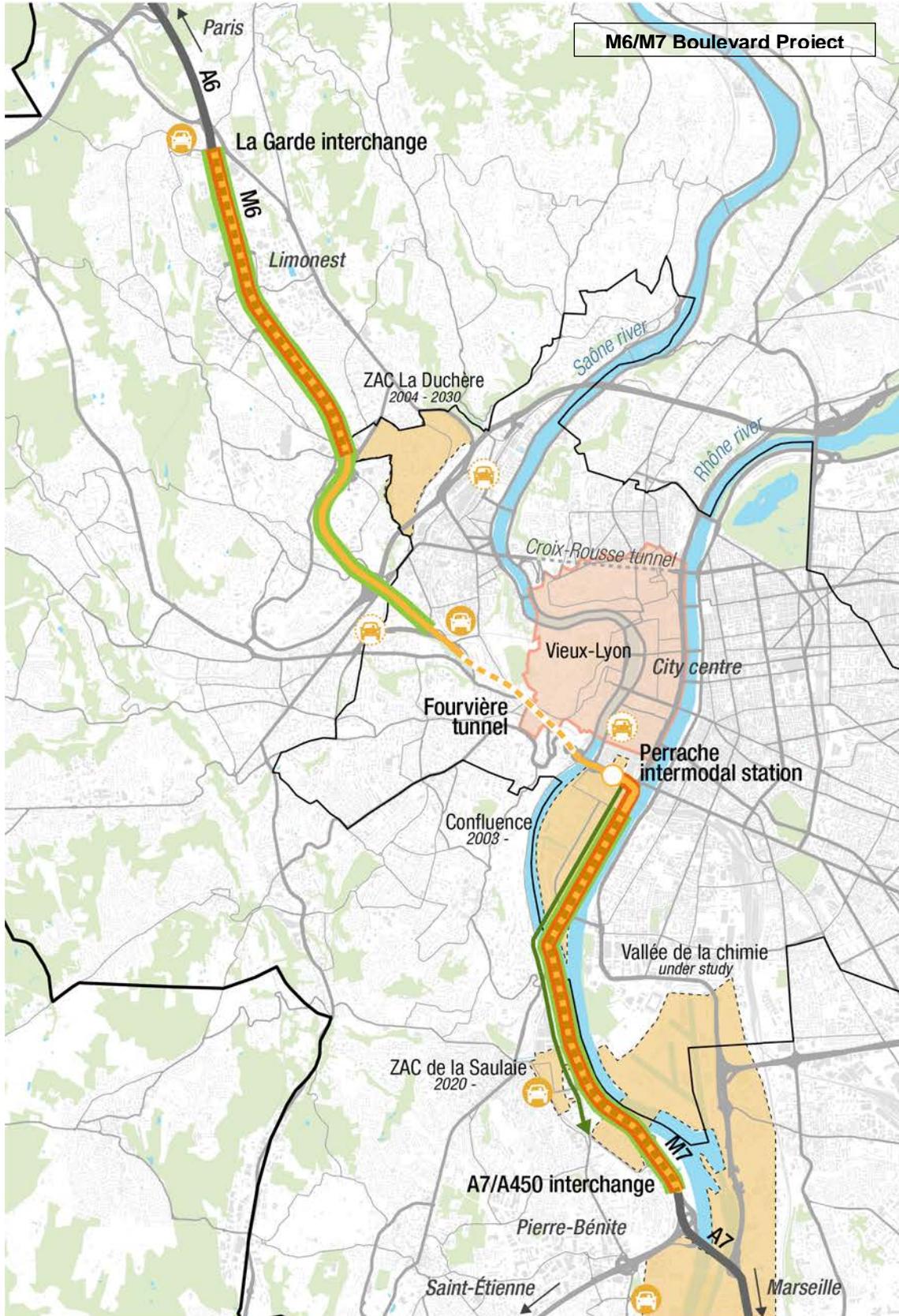
The debate went on even after the public consultation and became a hot topic of the 2020 municipal elections. With the increasing criticism, the *Science Ring* progressively lost its supporters, including the central government. The project did not seem to be a priority by Lyon's inhabitants and Gérard Collomb, former mayor of Lyon and president of the Métropole decided to cancel his support of the project a few weeks before the elections.

The rising Green Party candidate, Grégory Doucet, pledged to abandon the project if he got elected. His appointment as mayor in June 2020, and that of another Green party member as President of Métropole de Lyon, marks the cancellation of the *Science Ring* project.

²⁶ Compte-rendu du débat public Anneau des Sciences Tronçon Ouest Périphérique de Lyon, Commission Nationale du Débat Public, May 2013

²⁷ DELIGIA Florent, "L'Anneau des sciences de Lyon ne verra jamais le jour, nécrologie d'un anachronisme", Lyon Capitale, May 19th 2020

²⁸ Débat public Anneau des Sciences, Synthèse du dossier, Département du Rhône, Métropole de Lyon, Réunion territoriale, 2013



M6/M7 Boulevard Project

- M6/M7 urban boulevard
- Express bus lane
- Carpooling lane
- Bicycle lane

- Landscaping
- Park-and-ride
- Adjacent urban project
- Unesco Historic site

- Municipal boundaries
- Metropolitan boundaries

0 1 Km
 © L'INSTITUT PARIS REGION 2020
 Sources : OpenStreetMap, Métropole de Lyon



3.2. The Future M6/M7 Metropolitan Boulevard

3.2.1. Project Overview

To allow the metropolitan authority to manage and ultimately redesign the infrastructure, the A6/A7 had to lose their national status in 2016. Since status of Metropolitan Main Road (*'Route à grande circulation'*) as M6/M7. The initial project has been designed with a two-phased delivery: a preparation phase until 2021 and a transformation phase until 2030. By 2030, the M6/M7 corridor should become a multimodal urban boulevard, with pacified traffic and space for other modes of transport, while reconnecting with the city and the landscape. Working on the road axis should also allow an improvement of living conditions in the adjacent areas. From over 120,000 vehicles per day, the goal is to decrease traffic volumes to 80,000 vehicles in 2025 and eventually to 50,000 in 2030. In 2014, the total project cost was estimated around €140-150 million²⁹.

The project (see map) is currently carried out by Métropole de Lyon, in agreement with the nine affected municipalities. The central government is involved in the discussion for matters regarding large-scale traffic and road regulations (e.g. regulation for carpooling lanes). SYTRAL, the public transport and mobility authority in the Lyon region, is the main stakeholder for public transport related themes. UrbaLyon, the metropolitan planning agency, is also a stakeholder the project, providing strategic advice and leading prospective studies for Métropole de Lyon.

The 2020 municipal and metropolitan elections mark an important change for the M6/M7 project. The newly elected city and metropolitan councils cancelled the project of the Science Ring western bypass, initially presented as complementary to the transformation of M6/M7. Lyon's new decision-makers are driven by the ambition of greening the city and changing mobility patterns, targeting a strong reduction of the place of cars. They have defined the transformation of the left Rhône banks as one of the main priorities of their municipal mandate³⁰.

This recent political shift raises immediate questions regarding the phasing of the current M6/M7 project and more fundamental questions concerning the redesigning of the whole approach, including its framing and ambitions. One of the interesting questions raised is what could be the conditions to achieve a radical transformation on the axis and a significant decrease of car traffic without building any road alternative.

The phasing described below relies on the initial project approved in 2017, currently being revised.

3.2.2. Phase 1: Preparing for the boulevard (2016-2021)

A public consultation and preliminary studies were launched in 2018 for the future M6/M7 boulevard. Meanwhile, Métropole de Lyon has engaged progressive actions to foreshadow the future transformation of the 16 km stretch. The aim is to get people accustomed to the new situation and promote behavioural changes towards alternatives of solo car use, while 'heavier' transformations are under study.

In 2019, speed limit was lowered from 90 to 70 km/h to discourage long distance traffic on the axis and reduce noise levels. In 2020, heavy goods vehicles in long distance were not allowed to circulate on M6/M7 anymore. The same year, the northern and southern sections underwent landscape works to create planted lanes along the road. These new green frames signal the entrance in the metropolitan area and the transition towards the urban boulevard. During summer 2020, an express bus lane was put into service on M6, between La Garde interchange in Dardilly (northern section) and Vaise station, in northern Lyon.

The dedicated bus lane was created on the hard shoulder's location. At the bus terminal in Dardilly, a park-and-ride was open to the public, with parking spaces for cars and bikes. Commuting by bus between Dardilly and Lyon takes 20 minutes. In Vaise station, one can take another bus, the metro or a regional train.

²⁹ Cécile FERE *et al.*, *Les Métamorphoses de l'autoroute urbaine*. Point FNAU, Ed. Alternatives, 2014

³⁰ Site visit and exchanges with Juan Castro, Cécile Bracco and Odile Pagani (Grand Lyon) and Olivier Roussel (UrbaLyon), Sept. 2020.



M6 Northern section, towards Limonest

In the northern part of the metropolitan region, the M6 is surrounded by green areas, serving as buffer spaces helping to protect neighbourhoods from noise disturbances

© L'Institut Paris Region, 2020



M7 south of central Lyon along the Rhône banks, looking north

The highway has 2x3 lanes and is very often congested

© Terry Pak

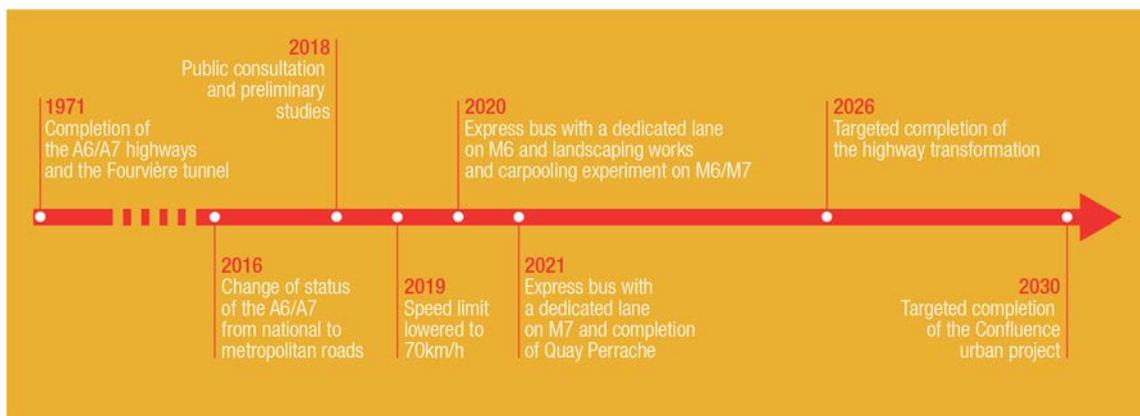


Artist's vision of the future Quay Perrache street along the Rhône, in the central peninsula (2017 Project)
 SPL Lyon Confluence is transforming public spaces surrounding M7 along the waterfront to improve the road's urban integration
 © Métropole de Lyon

A carpooling experimentation on M6/M7, planned to start in September 2020, was postponed until December 2020. Carpoolers have now a dedicated left lane on the M6 northern section which is activated five days a week. Reserved loading/unloading spaces for shared vehicles were also designed in La Garde's P+R. This carpooling lane is only the second one to be delivered in France: the first experimental carpool lane on a highway was implemented on an 8 km section of A48 highway in 2020 in city of Grenoble.

On the M7 southern section, where the number of lanes did not allow for two reserved lanes, express busses share the lane with carpoolers since December 2020. Within 20 minutes, the new bus service is meant to link central Lyon (Bellecour) with Yvours-Irigny station in the southern periphery.

Another incremental step in the transformation is the redesign of public spaces on Quai Perrache, along the M7 axis bordering Confluence. These landscape works are undertaken by the Grand Lyon and Lyon Confluence public developer (SPL). The project does not change the road capacity yet, but aims for a better integration along the waterfront, with larger sidewalks, vegetation and a cycling path joining an existing one southwards in La Mulatière. The transformation of Quai Perrache should be completed in 2021.



Timeline of the M6/M7 Transformation Project in 2020

Source Grand Lyon © L'Institut Paris Region, 2020



The entrance of the P+R in La Garde (Dardilly, northern section) named 'Lyon's gate' (Porte de Lyon)
 The P+R was inaugurated in 2020. It has facilities for car and bike parking to encourage people to commute by bus to central Lyon

© Tanya Sam Ming, L'Institut Paris Region, 2020



M6 in the northern section (2020)

The northern part of the transformed highway underwent landscape works in 2020. A dedicated express bus lane has been created, linking Vaise station (Lyon) to La Garde P+R (Dardilly).

© Métropole de Lyon, 2020



M7 highway along the Rhône River in the southern section with the new landscape planted in 2020
 © Métropole de Lyon, 2020

3.2.3. Phase 2: Redesigning M6/M7 as a boulevard (2021-2030³¹)

From 2021 onwards if plans follow initial schedule, the M6/M7 axis should be gradually converted into a multimodal urban boulevard, with incentives for a modal shift to alternatives to solo car-use. The construction of new park-and-rides hubs is planned: there should be in total 7 on them in the corridor. The aim is to encourage people to enter the city core without their cars. In complement, the public transport system should be developed, as well as facilities to foster cycling and walking.

The redesign of M6/M7 is used as a sign to drivers of a change of environment, therefore calling for a slower speed and a share of road space with other modes. In that regard, artist visions commissioned by Métropole de Lyon show an urban boulevard with removed highway signposts and safety barriers. A different color for lanes dedicated to buses and carpooling is also considered but the matter needs to be further discussed with the central government, which is in charge of road regulations. The transformation of M6/M7 should give the possibility to reclaim adjacent public spaces, especially on the central section. On M7 southwards, access to the Rhône's riverfront should be opened to pedestrians, with a pacified car traffic. A promenade along the banks in Lyon, La Mulatière, Oullins and Pierre-Bénite initially planned for 2030, but could be delivered before 2026 in a revised project.



Artist's vision of the transition towards the urban boulevard in Pierre-Bénite (southern section) (2016 Project)
 New vegetation and removal of highway signage.
 © Métropole de Lyon (extract)

³¹ Awaiting for the new phasing agenda as project is being revised by the newly elected mayor of Lyon and president of Grand Lyon.



Artist's vision of the M7 urban boulevard in central Lyon, on the Rhône right bank (2016 Project)

The M7 Boulevard welcomes buses, pedestrians and cyclists, with two lanes remaining for cars. On the Rhône bank, the M7 will open to its urban environment and reconnect with the waterfront.

© Dumetier Design, Métropole de Lyon



Artist's vision of M7 in La Mulatière and Oullins (southern section) (2016 Project)

These socially-deprived areas should benefit from a new promenade along the Rhône River and a calmer traffic on the M7 axis

© Métropole de Lyon

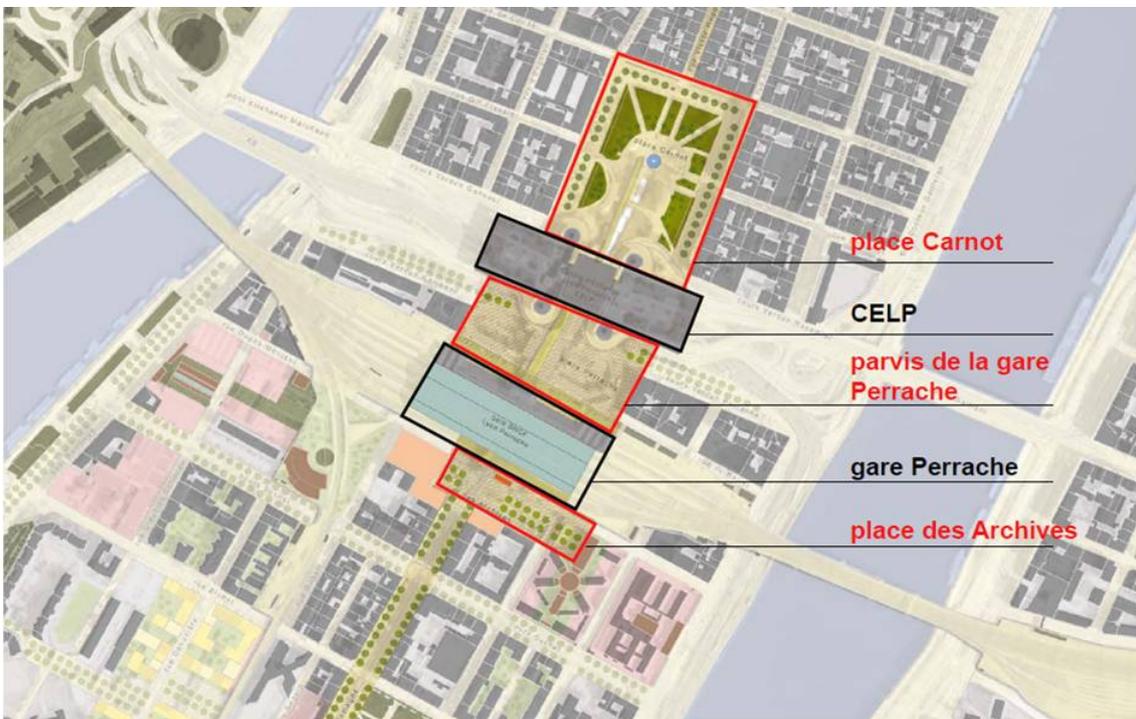
3.2.4. Redesigning Perrache's Highway-Based Megastructure

Opened in 1976, Perrache Intermodal Hub (Centre d'échanges de Perrache) was built as a response to the junction of the M6/M7 highways in the vicinity to Perrache's high-speed train (TGV) and regional station. This *megastructure* was meant to reconnect the northern to the southern side of the Perrache peninsula, giving access for pedestrians, cars and metro through both train and bus stations. This intermodal hub is a complex system made of overlapping functions:

- The M6/M7 east to west motorway underpass with two interchanges,
- A north to south metro tunnel (ground floor),
- 3 north to south local traffic road tunnels,
- A long distance bus station (first floor),
- A silo car-park (upper floors),
- An elevated pedestrian crossing through train and bus stations,
- A shopping mall (central upper floors),
- An exhibition space (top floor and rooftop; now closed).

Another layer of complexity was added in the 2000s, when one of the three tunnels was reserved for the passage of the tramway, joining the area of Confluence.

What was meant to be a connector and a meeting point increased the severance of the southern peninsula. Perrache is now an uncrossable labyrinth for pedestrians and a nerve point for traffic jam. Pedestrian crossings on both sides of the train station and the intermodal station are on a different level, making them hard to find. The buildings surrounding the transport node are depreciated due to the important noise levels and the difficulty to move around. Among local residents and elected officials, the intermodal station is often criticised. In the 1990s, Mayor Raymond Barre even considered its demolition.



Perrache's "bottleneck" of transport infrastructure

At the centre of the peninsula are located the railway station and the intermodal station, forming together Perrache's "bottleneck". They contribute to traffic congestion and urban barriers between the northern and the southern parts of the area. The intermodal station is marked as 'CELP' (*Centre d'échanges Lyon Perrache*).

© SPL Lyon Confluence

Transforming Perrache's transport node (even without removing the highway) is an incredibly difficult puzzle to solve, the intricate spatial system being complemented by a complex legal framework regarding ownership of the different parts. Since the 2010s, studies and design for a better urban integration have been done they seem to lack global consistency.

During the public consultation for the Science Ring project in 2012-2013, design sketches for both of Perrache's road junctions were presented, set in a projected future with reduced car traffic levels on M6/M7. Métropole de Lyon commissioned architects to imagine how public spaces surrounding the station could transform (see 3D sketches below): half of the underpasses would be removed, car lanes reduced and road ramps removed. Space reclaimed from the highway facing the river on each side of the complex could be converted for the pedestrians. This scenario would help reconnect with Perrache's history, as it used to be a large planted plaza before the construction of A6/A7 highways. Somehow, with the political shift and upheaval in the M6/M7 project, these sketches do not seem to have had a follow-up so far.

In 2015 was launched the project "Let's open Perrache up" (*Ouvrons Perrache*), meant to transform the transport node of both stations. This initiative takes place in the continuation of Confluence's regeneration project. Project coordination is complex, with four different stakeholders involved: SNCF (National Rail; owner of train station), Métropole de Lyon (intermodal station), SYTRAL (public transport) and SPL Lyon Confluence (public space).

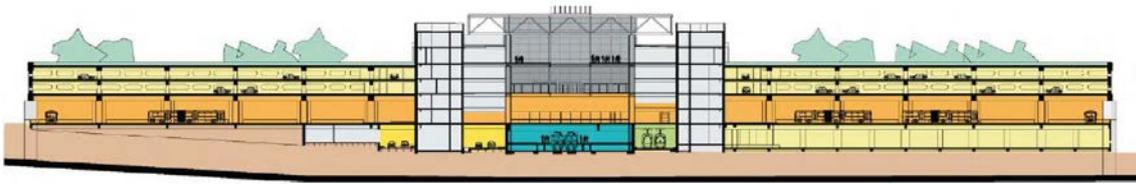
The first phase of Perrache's transformation started in 2018 and should be completed very soon. Construction works aim at improving the walking and biking connections between the north and south of the peninsula: a road tunnel linking both stations is to be converted into a pedestrian and bike lane, the extension of the tramway line, the redesign of the southern plaza facing the train station (*Place des Archives*), and easier accesses to metro and to trains.

The second phase was launched in 2020, in the form of a design call for proposals. The focus is here on the intermodal station and the northern plaza (*Place Carnot*). Proposals should improve the current spatial organisation and improve the urban integration. Winning team should be selected in early 2021.



Lyon Perrache's complex megastructure, with the intermodal station overlapping the A6/A7 highways

© D.Valot



- M6/M7 highway
- motor vehicle
- metro
- tramway
- parking space
- bus station
- technical space
- shopping mall
- exhibition space

Longitudinal section of Perrache intermodal station, current situation

Transforming Perrache is a complex task since functions overlap on one another: highway, bus station, parking lot, shopping mall...

© Aliénor Heil-Selimanovski, according to René Gagès Archives



Spaghetti junction today (East side)



Potential transformation of Perrache on the eastern side (Rhône). Artist's vision from the 2013 consultation

Removing roads ramps and car lanes would allow for the creation of pedestrian public spaces facing the river

© Dumetier Design, L'Atelier Villes & Paysages. Photo: Métropole de Lyon



West side of Perrache today



Potential transformation of Perrache on the eastern side (Saône). Artist's vision from the 2013 consultation
 Reducing road capacity opens the possibility to redesign public spaces between Perrache station and the Saône River
 © Dumetier Design, L'Atelier Villes & Paysages. Photo Métropole de Lyon

3.2.5. River and City: The North-South Expressway along the Rhône

From the northern Ring Road to the tip of the peninsula in the south, Lyon has a 5 km long Rhône river bank occupied by heavy traffic boulevard with ramps at the main junctions. This is a remnant from the 1950s, when the Rhône's right bank was meant to be transformed into a north-south motorway crossing the city centre³². The project was never completed and only 2 km in the southern section have become the M7 highway. This piece of infrastructure is a major barrier between the UNESCO-listed old city of Lyon, the Croix-Rousse hill and the now artificialised river side.

The road is has of 2x3 lanes, with four underpasses (from north to south): at the junction with the Croix-Rousse tunnel, at the crossing with the Morand bridge, at the crossing with the Guillotière bridge and the last one under the A7 interchange. Up to three parking lanes occupy this tree-lined hybrid boulevard: one on each side of the road and a median parking space.

The Rhône's right bank is disconnected from the river. There are only a few locations where pedestrians can access the water. Cars tend to block the views towards the Rhône and walking along the axis is uncomfortable, due to noise and narrow sidewalks.

Lyon's new city council, elected in 2020, defined the improvement of the north-south axis as one of their priorities for the forthcoming years. During the municipal campaign, the mayor-to-be's team presented a concept for the north-south axis, with a conversion into a pacified urban boulevard, a tramway extension linking the peninsula (Bellecour) to La Part-Dieu CBD. The concept also includes the reduction of the road space to 2x2 lanes, the creation of bike lanes and the widening of sidewalks. The project is currently under study and should be connected to the ongoing transformation of Confluence's Quai Perrache and the future redesign of the M7 highway.

The combined transformation of both the M7 highway and north-south axis could reunite the City-Region with its historical river along a 10 km central stretch.



The Green Party's concept proposal for the transformation of the north-south axis (2020 municipal campaign)

The concept presents the road axis a green urban boulevard, with a new tramway extension, cycling paths, larger sidewalks and a reduced presence of cars.

© EELV, 2020

³² Louis BALDASSERONI, "Une autoroute dans la ville: l'axe Nord-Sud de Lyon", Histoires lyonnaises, 2017



The north-south axis along the Rhône bank

Along this road, the bank is higher than the water level, pedestrian access to the Rhône is possible at a few locations only. Important traffic and parking spaces block the view with the waterfront.

© Tanya Sam Ming, L'Institut Paris Region, 2020



The north-south axis underpass approaching Perrache's interchange along the right bank of the Rhône river

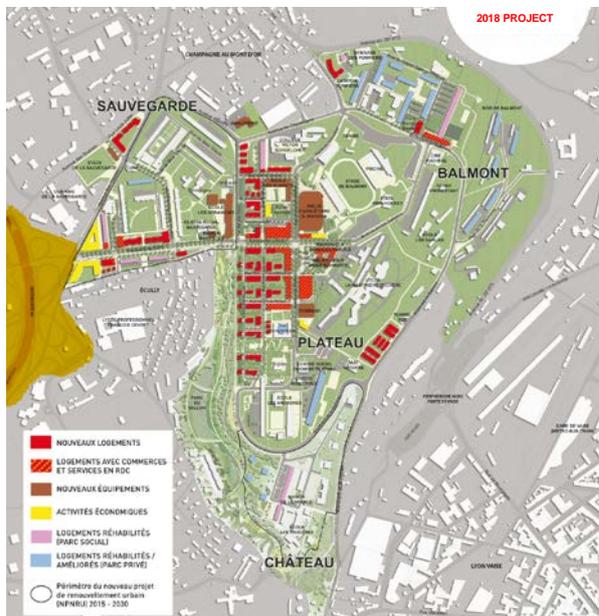
© Tanya Sam Ming, L'Institut Paris Region, 2020

3.3. Urban Regeneration in the M6/M7 Corridor

The 16 km stretch of M6/M7 subject to transformation crosses nine municipalities, each with a different character. The conversion of highway should benefit the adjacent areas, as noise and air pollution levels are reduced. Neighbourhoods currently separated by a 50 m wide barrier could be reconnected, as well as the Rhône river banks. At this stage, four major urban regeneration projects within the M6/M7 corridor are conducted more or less independently from the highway transformation.

3.3.1. Urban Renewal of La Duchère (Lyon)

In northern Lyon, La Duchère is a large social housing estate built in the 1960s. Since 2003, this 120 hectare site is undergoing an urban renewal process led by a public developer (SERL). The renewal program includes demolition/reconstruction of 1700 housing units, with new facilities and green space, as well as the improvement of connections with the rest of the urban area. The new express bus on M6 linking Vaise station to Dardilly crosses La Duchère on a new dedicated street. The project currently is in its last phase with the renewal of the Sauvegarde area, close to the M6 highway. Transformation of the M6 junction could reconnect the area with neighbourhoods to the west (map).



La Duchère's 2016 Masterplan with M6 highway to the west (orange)

© Atelier Alain Marguerit, SERL 2014, modified by L'Institut Paris Region



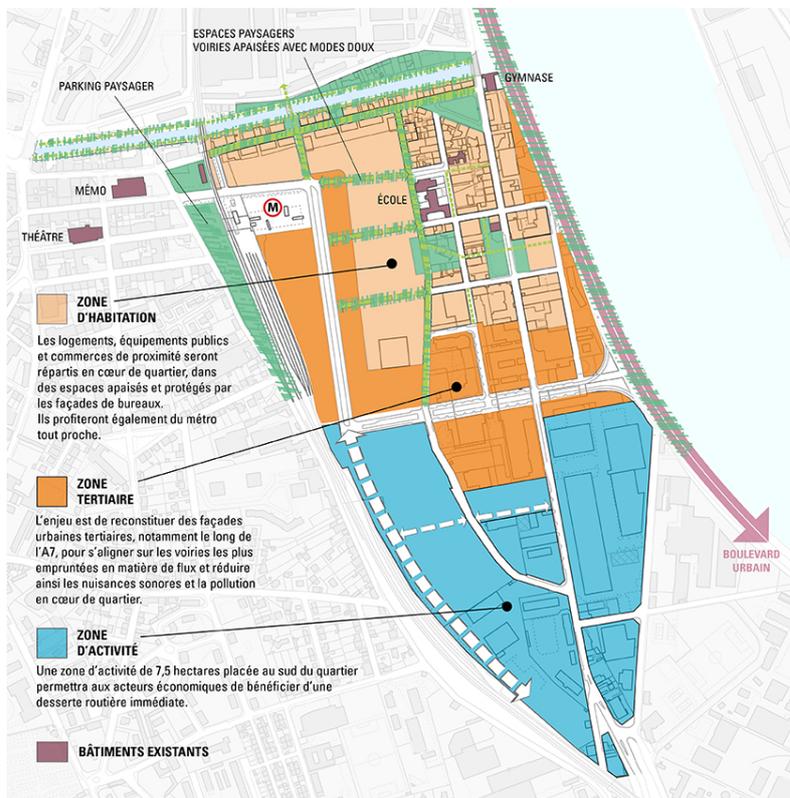
The new Rosa Parks Avenue with its express bus lane leading to M6 highway awaiting redevelopment in 2014

© Paul Lecroart, L'Institut Paris Region

3.3.2. The Regeneration of La Saulaie (Oullins)

The industrial municipality of Oullins, in southern Lyon, borders the Rhône River. Between the railways and the M7 highway is located an area composed of a large brownfield site, industrial buildings and poor quality housing. In 2018, the municipality initiated the regeneration of this 40 hectares site, starting with a new neighbourhood in the development area of La Saulaie (17 hectares), a large brownfield site close to the metro station. The project steered by a public developer (SERL).

The area should be redeveloped by 2033 into a mixed land-use district, with housing, office spaces along a future M7 Boulevard and a business park. Reconnecting this isolated site with the rest of Oullins relies on new green and blue corridors and increased accessibility. The metro arrived there in 2013, with an extension southwards planned for 2023. Transforming M7 into a multimodal urban boulevard is crucial for the regeneration of La Saulaie and the rest of the city, and its reconnection to the riverfront. However, timing of the road change and that of the development will need to match.



Planning principles for the future of La Saulaie along the M7 highway

New office spaces (orange), businesses (blue) should line the future M7 boulevard © Ville d'Oullins



The artificial channel of the Yseron river in the industrial neighbourhood of La Saulaie

© Paul Lecroart, L'Institut Paris Region

3.3.3. The transformation of the Chemistry Valley (since 2014)

The *Chemistry Valley* is located along the Rhône River in the southern part of Lyon's metropolitan area. It is one of the largest industrial areas in Europe, with an important concentration of chemical and petrochemical activities. The area is approximately 800 ha wide, it stretches on a 17 km long corridor over 14 municipalities, and hosts around 20,000 jobs. The Chemistry Valley is an important driver of Lyon's economic development but remains isolated from the urban life.

A first development initiative '*L'appel des 30 !*' was launched in 2014 by Métropole de Lyon. This call for proposals was elaborated with the Valley's industrial companies and affected municipalities. The aim was to define an economic and urban development plan for the Chemistry Valley by 2030. Renewed twice, this initiative led to the creation of the Task Force Chemistry Valley (*Mission Vallée de la Chimie*) to carry out the project with the appointment of consortium OMA/Base/Suez for the masterplan. The Task Force is made up of public and private stakeholders, including the Valley's largest companies.

By 2030, The Chemistry Valley wishes to reinforce its strategic role as an international leading area for industry, research and innovation while improving its urban integration and shifting towards a more sustainable model. The Task Force aims at:

- Developing renewable energy in the valley,
- Rethinking productive landscapes through biodiversity and renaturation strategies,
- Optimising transport systems, including rail and waterway freight transport.

The M7 project ends at the gate of the Chemistry Valley in Pierre-Bénite. In the valley, the presence of the highway is still seen as an asset for businesses located along the axis offering fairly good access for heavy goods vehicles. This shows that the transformation of the M7 must be designed as to make freight traffic to continue to move smoothly, which may require traffic management measures such as dynamic speed limit management or road pricing. If the M7 boulevardisation is a success it could possibly be extended south to Givors in the long term.



The Chemistry Valley, between the Rhône River and the A7 highway

This industrial corridor is meant to transform into a more sustainable and more urban area in the coming decades, while comforting its lead position as a major economic driver. A7 highway (centre) meanders through the Valley.

© Jacques Leone



From top to bottom: the urban renewal of La Duchère; Brownfield sites of the future ZAC de La Saulaie; Masterplan for the development of the Vallée de la Chimie

© P. Lacroart, L'Institut Paris Region, 2014- Ville d'Oullins - OMA



Heavy-goods traffic on M7 Highway along the artificialized banks of the Rhône in the centre of Lyon

© Paul Lecoart, *L'Institut Paris Region*, 2017



The deprived Saulaie neighbourhood in Oullins with the M7 blocking access to the Rhône River in the background.

© Paul Lecoart, *L'Institut Paris Region*, 2020

4. Discussion and Takeaways

The Evolution of the M6/M7 Highway Transformation Project

The decommissioning and gradual transformation of the 16-km stretch of the M6/M7 motorway into a metropolitan boulevard is a major project for Lyon. It has the potential to reconnect the whole City-Region to its river, not only along a 6 km southern section, but along a complete cross-city riverside stretch of 11 km if it is combined with the redesigning of the north-south hybrid Rhône bank expressway.

Since it was approved in 2017, the M6/M7 project has been mostly focused on improving the highway landscape and managing the car-traffic demand on the highway with express bus services, P+R and carpooling lanes. The assessment of these experiments will be very much affected by the influence of Covid lockdowns on the commuting patterns region-wide. It is however likely that the impact of these light measures on the reduction of traffic will not be that significant.

A further critical step will be the revision of the global strategy and transformation project in light of the western highway ring (the *Science Ring* project) cancellation by the new elected officials.

The potential impact of a future reduction of speed and capacity in the M6/M7 corridor may be huge, going far beyond the Grand Lyon's limits. For one thing, by reducing the attractiveness of fast cross-city vehicle-travel, this project may have an impact on the eastern Lyon bypass (A46/RN146) affecting European and national traffic. Regionally, it may effect mobility patterns of car commutes from towns and villages 20 or 40 km from central Lyon, some of them not having few, if any, public transport alternatives.

This raises the issue of political cooperation with suburban territories in the area of influence of the crossed by the M6/M7 corridor infrastructure. How to create a compromise that benefits all stakeholders, including people living 20-40 km from the city centre? One of the themes to be researched is the increase in public transport services and multimodal facilities (P+R, carpooling priority; regional express trains and busses) needed to compensate for capacity reduction on M6/M7. The bike and e-bike development potential needs to be assessed too.

In order to transform the M6/M7 and its surrounding districts, reducing car-use for those who have other transport alternatives may be a major local and regional issue that will need the backing of some kind of constraints, such as infrastructure toll, road-use tax or congestion charge giving priority to alternatives to metropolitan-bound solo-car use and truck traffic and encouraging through traffic to use external bypasses and ring-roads.

Other major urban highways that require a better urban integration have been identified in the 2017 Urban Structure Plan. Among them is Boulevard Laurent Bonnevey, Lyon's most heavy-trafficed road axis (150,000 to 175,000 vehicles per day). This 25 km long eastern ring road impacts 35,000 inhabitants living less than 300 metres away. In 2019, the Métropole decided to reduce the speed limit to 70km/h, a first step for a future transformation project that needs to be studied and financed.

The Green and Urban M6/M7 Corridor Project

Reducing the impact of M6/M7 could open major urban regeneration opportunities for deprived areas that were considered inaccessible or unliveable. A very draft estimation by us shows that over 330 hectares of land could be revitalised by transforming the M6/M7 into a boulevard, adding to the opening-up of the riverfront for the 150 hectare new Confluence district (and reinforcing of its synergies with the 700 hectares of the Gerland redevelopment area).

To the north of the Fourvière tunnel in the Dardilly/Limonest, transforming the M6 corridor into an urban avenue could stimulate the transformation of business parks into a mix-use northern gateway for the Grand Lyon; reducing the footprint of the highway and of its interchanges in the La Duchère-Valvert areas could make room for new parks along the highway transformed into some kind of parkway boulevard. All together, some 165 hectares of urban land could potentially be redesigned in this section.

To the south of the tunnel, transforming the M7 corridor could potentially give back to the city a 6 km stretch of river banks that could be softened, renatured into a linear riverfront park and reconnected to the city and town centres. An estimate by us shows that around 45 new street connections to the river could be made, opening up the potential revitalisation of 160 hectares of deprived neighbourhoods and underused industrial and rail lands.

The urban planning and environmental design components of a future M6/M7 corridor project need to be worked on and coordinated to the revised transport and mobility management project.

Grand Lyon's Experience

In its attempt to implement strategies that move away from car-oriented patterns, focusing on public transport, multi-use public space and compact urban development, Grand Lyon's experience is most interesting for other European city-regions.

Lyon's 30-year know-how in pedestrian-friendly public space planning and delivery has had a significant impact on the city, with more intense and diverse uses of urban space, a steady decrease in car-traffic within the central areas of the metropolitan region and an increase in use of the public-transport system, including of the many extensions of metro, tram and bus rapid transit (BRT) lines.

Previous and successful highway transformation into boulevard in eastern Lyon with the A43 highway has resulted in reconnecting deprived neighborhoods, regenerating public space, with no evidence of any negative impact on congestion: approximately 25% of traffic has evaporated in the process, showing how road environment can influence travel behaviour.

Generally, Grand Lyon has been very consistent and successful as a City-Region authority in building a leadership on urban intensification and transport strategies. At the wider metropolitan region scale, Lyon has long experience of inter-territorial cooperation at different scales, including the setting up of a Regional Transport Organisation in 2013 covering 4 counties and 435 municipalities. But, moving away from the car-oriented development model and delivering a car-free living opportunity for everyone in the region will require more joint-thinking and common action on coordinated mobility, environmental and urban development. Building a comprehensive regional express train network, solving the housing unaffordability issue in the central areas of the region are difficult challenges to face. With less investment capacities than just a year ago.



The M7 highway south of Lyon Confluence in 2014. The sign says "use the metro, the bus or your bike".

© Paul Lecroart, L'Institut Paris Region

KEY DATA ON PROJECT

M6/M7 Highway Transformation					
Strategic Documents	Project progress	Relevant authority	Highway section subject to transformation	Daily traffic prior to transformation	Potential regeneration area
<p>Plan local d'urbanisme et de l'habitat intercommunal 2016 (Urban & Housing City-Region Masterplan)</p> <p>Schéma de cohérence territoriale 2017 (Metropolitan Region Structure Plan)</p> <p>Plan de déplacements urbains 2017 (SUMP)</p>	<p>Phase I (2016-2020) delivered</p> <p>Phase II (2021-2030) under revision</p>	<p>Métropole de Lyon</p> <p>National Government</p>	16 km	<p>115,000-120,000 vehicles per day</p>	330 ha + (estimate)



The M6/M7 project has so far focused on mobility management.
 © Métropole de Lyon 2016

INTERVIEWS

Olivier Roussel, Deputy-Director, Head of Metropolitan Strategies UrbaLyon, September 2020

Sébastien Rolland, Regional Planning Coordinator, UrbaLyon, May 2020

Laurent Michelin (Former Director of Infrastructure, Métropole de Lyon), October 2020

Site visit and exchanges in September 2020 with:

- Odile Pagani, Head of Public Spaces and Infrastructures, Métropole de Lyon,
- Juan Castro, Project Manager M6/M7 Project, Métropole de Lyon,
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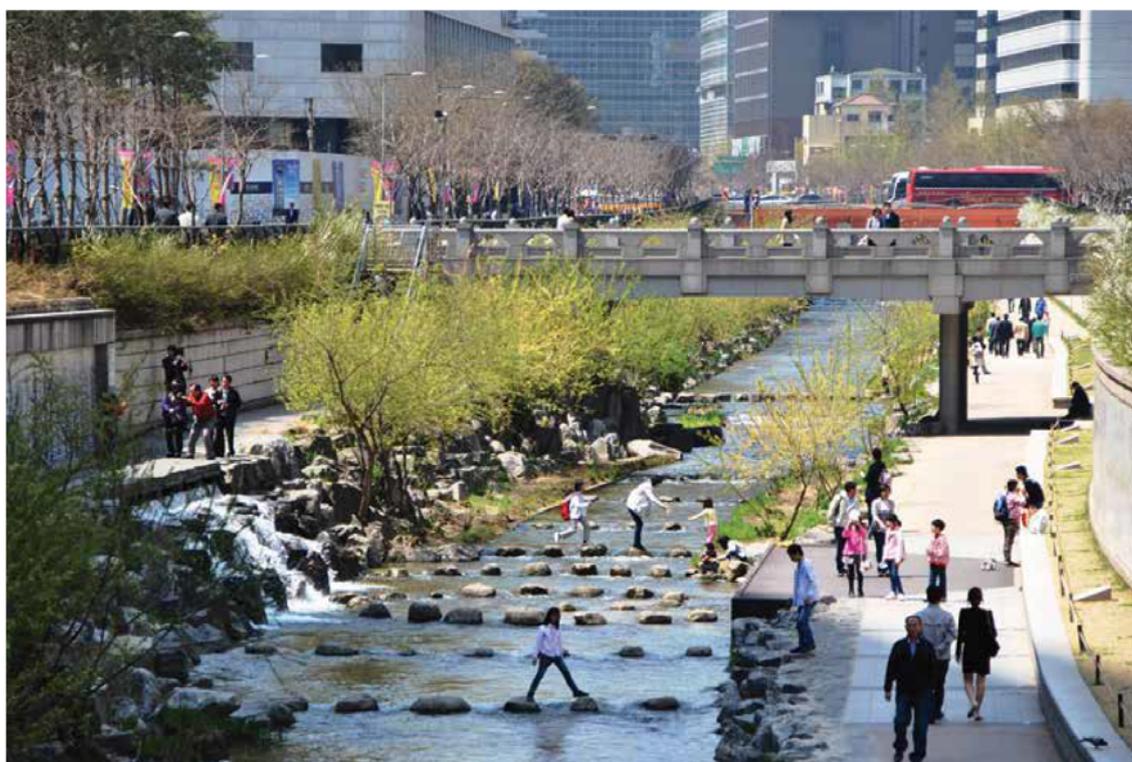
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APPENDIX

Reinventing Cities: From Urban Highway to Living Space

Paul Lacroart shows the many benefits of transforming urban highways into people-friendly boulevards



In 1974 Portland replaced its Harbor Drive with a waterfront park; in 1991 the Embarcadero Freeway in San Francisco was dismantled; in 2001 New York rebuilt the 12th Avenue where an elevated highway had stood; in 2005 the Cheonggyecheon Expressway in Seoul made way for the river hidden underneath; and between 2013 and 2017 Paris pedestrianised the Seine riverbank highway. Now Paris Metropolitan Region is launching an international design competition to rethink the *Périphérique* and the *Grand Paris* motorway network.

So will segregated highways become a thing of the past in the post-car and carbon city? Research by the Planning Agency for the Paris Region (IAU) suggests that converting stretches of highways into multi-use boulevards and public spaces may open up new avenues for rethinking our cities in terms of liveability, mobility and resilience.

HIGHWAY-TO-BOULEVARD CASE STUDIES

Functionalist thinking and post-war planning have left many large cities, including London and Paris, with extensive, yet unfinished networks of urban highways. As they were built they were used, and still have a role in moving people and goods

within metropolitan areas. However, these limited-access grade-separated roads create physical barriers, tend to devitalise centres, neighbourhoods and waterfronts, and hinder regeneration. The high levels of traffic they support generate noise, dust and air pollution, raising health and social justice issues. By providing seemingly easy access for cars, extensive highways networks tend to encourage car-centric lifestyles, urban sprawl, and more traffic congestion.

In the last decades, many cities have successfully started tearing down obsolete urban highways and replacing them with multi-use boulevards lined with mixed use new development, or new linear parks. Why are they doing that? What happens with the traffic? What are the benefits and costs? Are these projects backed by public support?

1 Seoul: the Cheonggyecheon River, formerly a highway carrying 168,000 cars a day; removal of the viaduct and restoration of the river significantly reduced traffic. Image by Paul Lacroart IAU

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To find answers to these questions and others, I have looked into over 20 highway-to-boulevard experiences either fully completed or planned in cities worldwide. Of these, nine cases were studied in depth on-site with reports published (in French): Seoul (Cheonggyecheon Expressway), Portland (Harbor Drive), San Francisco (Embarcadero, Octavia), New York (West Side, Sheridan), Milwaukee (Park East), Montreal (Bonaventure), and Vancouver (Northern False Creek Viaducts).

Most of these cases involve fairly central stretches of highways supporting heavy traffic volumes (in the range of 50,000 to 150,000+ vehicles per day), before being replaced by a boulevard and/or a linear park. This research is reference material to inform highway transformation strategies and projects in the Paris Region.

WHY DO CITIES GET RID OF URBAN HIGHWAYS?

Depending on the physical context and circumstances, city authorities decide to remove highway stretches for quite a pragmatic combination of reasons, including:

- **Aging infrastructure and rebuilding costs.** In San Francisco, Seoul, New York (West Side), or Toronto (East Gardiner), it appeared cheaper to dismantle crumbling elevated highways than to rebuild or bury them. Recycling viaducts into pedestrian connections can also give a new life to obsolete infrastructure cheaply, as in Seoul (Seoullo 7017) and Paris (La Défense Boulevard).

- **Revitalising blighted areas and unlocking redevelopment opportunities.** This is a main driver for change in Vancouver, Milwaukee, Montreal, Birmingham (Inner Ring Road), Lyons (A43 Mermoz), and Oakland (I-980).

- **Reclaiming the waterfront.** Transport engineers enjoyed building highways along river or seafronts, but these created barriers and therefore suppressed real estate values. Reconnecting cities with their historic setting and 'giving the waterfront back to the people', residents and visitors alike, often means converting the highways, such as in Portland, Seoul, New York and Paris.

- **Reducing through traffic and related nuisances.** This is central to the strategy supporting the Seoul, Paris, Lyons (A6/A7 Confluence), and Strasbourg (A35) reconstructions.

These context-specific goals are usually part of wider urban intensification policies, eco-friendly transport plans and economic strategies. However, many highway removal projects were accidental: both the Embarcadero and Central Freeway viaducts in San Francisco were closed after being damaged by the Loma Prieta earthquake in 1989, and New York's West Side elevated highway collapsed when a maintenance truck went through the viaduct in 1973!

DOES HIGHWAY TRANSFORMATION REALLY HELP REGENERATE CITIES?

Evidence from research shows that redesigning highway corridors can be a powerful driver for regenerating blighted or abandoned parts of cities, with a lasting positive impact on the city as a whole. Removing visual barriers, reconnecting streets, and improving the quality of the environment has changed the face of Portland, San Francisco, Seoul, Milwaukee and Birmingham. Replacing interchanges and ramps by straightforward crossroads unlocks vast pieces of land that can be reconverted into denser mixed use districts and parks.

WHERE DO THE CARS GO?

To many traffic engineers' surprise, closing highways does not usually create traffic chaos beyond initial adjustments. Where spare road capacity did exist in some of the cases studied (Seoul, San Francisco, New York), car traffic switched to local street networks. Traffic thus gets distributed more evenly on a larger number of streets. Congestion remained limited and less than forecast.



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Average daily traffic in the road corridor may decrease dramatically after removal – from 20 per cent in Portland to up to 82 per cent in Seoul. When accounting for trips diverted to alternative roads or to public transport, a significant share of earlier traffic appears to have simply evaporated, typically in the range of 10-25 per cent in the cases studied. Faced with a reduction of road capacity and speed, a proportion of motorists change their routes, time of travel, trip frequency or activity programme, while others switch to alternative modes. Changing conditions makes car drivers think twice, leading some to change destination or give up less essential trips.

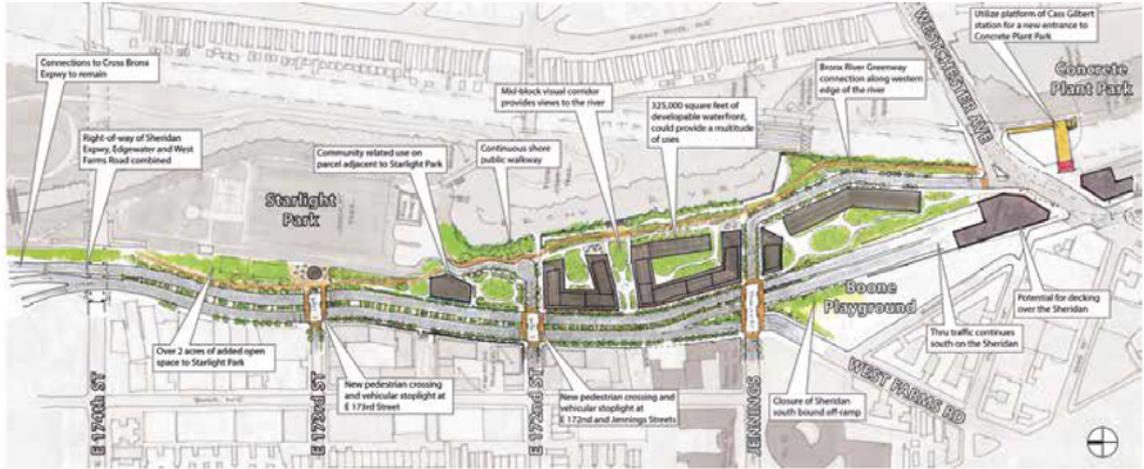
INCREASED CONNECTIVITY FOR EVERYONE

Some cities back up removal projects with specific alternative transport and travel management strategies. While reducing road supply on the Cheonggyecheon corridor, Seoul increased metro and express bus services, and discouraged solo car use through infrastructure tolls and parking policy. Local accessibility often improves with the removal of detours. A decrease of vehicular trips may mean increased accessibility for people as a whole.

Pedestrian and cycle mobility and static uses of public space for enjoyment increase sharply. However, more people on streets with still heavy car-traffic

2 San Francisco: Embarcadero Freeway in the 1960s, photo Tim Pharoah
3 The same area after the removal of the Freeway gave back the Bayfront to the people. Image by Paul Lecroart IAU

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levels (80,000 vehicles a day on New York's 12th Avenue today) may result in more car-pedestrian or car-cyclist collisions: the careful design of multi-lane boulevards is critical to their overall success. Ultimately, what we may see is a shift from a system providing off-peak fast travel for some (the motorists) to a 24/7 system of slower accessibility for all.

ENVIRONMENTAL EFFECTS

A reduction in the volume of motorised traffic and distances travelled tends to reduce fuel consumption, as well as CO₂ and fine particle emissions. Perceptions of noise levels decrease, even when actual levels remain high. Some highway-to-boulevard projects providing more greening may have a positive impact on the local climate: in Seoul, summer temperatures along the former highway corridor are now a welcome 5°C lower than on other arterial roads.

A FAVOURABLE COST-BENEFIT RATIO?

Transforming highways has a cost: in the cases studied, capital investment was in the range of €35-70 million (about £30-60 million) per kilometre. In view of the costs of maintaining or rebuilding infrastructure nearing the end of its life, transformation often proves cheaper. It may be a more affordable and longer-term solution than capping or tunnelling. Land freed for redevelopment can contribute to meet the costs.

COMPLEX PROCESSES, PUBLIC SUPPORT?

Redesigning a highway into a boulevard is always a lengthy, complex, and uncertain process in which open technical expertise,

citizen participation, and political will play key roles. Convincing car-users and business interests requires lots of data, meetings and leadership. While controversial to begin with, these projects often win over the public during the process... or not, as in the case of Seattle (Alaskan Way). Just as in the 1970s, extensive highway plans were defeated by public opinion in San Francisco, London and other cities, many smart grass-roots coalitions are pressing governments today to remove existing highways and flyovers in cities including Paris, New York, Denver, Dallas and Sao Paulo.

SYMBOLIC ACTIONS OR PARADIGM SHIFTS?

Highway transformation projects have a strong symbolic impact because they affect objects traditionally connected with the idea of freedom and modernity. They bring us back to some of the fundamentals of city development, such as nature, heritage, parcels and streets, and into a more holistic way of thinking.

LEARNING FROM INTERNATIONAL EXPERIENCE

From an urban planner and designer's perspective, the main lessons can be summarised in four points:

- Transforming urban highways into boulevards encourages people to change their travel patterns: less essential car trips tend to disappear and eco-friendly transport modes tend to increase. This can free-up road capacity for other needs, such as higher added value car trips or goods distribution. Improving local accessibility is not detrimental to longer-distance metropolitan or regional trips.
- An integrated boulevard offers a comprehensive metropolitan level of services connecting people and activities, moving as many people, if not more, than a highway, but at a slower, smoother speed. Boulevards enable social and cultural interactions to take place, ultimately the

4 New York: plan for the Sheridan Expressway in the South Bronx. Highway-to-boulevard projects can help deprived neighbourhoods while maintaining road capacity. Image by New York City Department of City Planning-ARR
5 New York: the boulevard replacing the Westside Freeway (2001): spectacular growth in bike and pedestrian traffic. Image by Paul Lacroart IAU



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raison d'être of cities and a key to their economic performance.

- Replacing a highway with a well-connected high-quality multi-use boulevard creates value and can unlock the mixed use regeneration of deprived urban spaces and improve the liveability of the city as a whole.

- As a tool in the sustainable planner's kit, highway conversion can be used pragmatically, for instance to leverage the revitalisation of a specific area. Successful tactical action on a short stretch where the highway is easy and cheap to change rapidly will help garner support for the transformation of longer stretches in the future. This is the strategy chosen by New York City for the Sheridan Expressway (by the Bronx River). In the United States, the country of the automobile *par excellence*, the success of removal projects stimulates many other cities to redesign obsolete highways. Seoul has removed 16 flyovers since 2005.

International successes in highway-to-boulevard transformation offer food for a wider rethinking of the functions, uses and status of urban highways in city regions. Profound changes are affecting the behaviour patterns of people and businesses, and the way that cities and regions are organised. Many developed cities worldwide, including Paris, New York, Los Angeles, Tokyo, London and Stockholm, have experienced an overall reduction in car use, traffic levels, and car ownership over the last decade.

Redesigning the existing urban highway network of large cities may be a smart way to address citizens' aspirations and metropolitan development challenges, including global warming related issues. It is not just about design: it is about rethinking the planning, movement, lifestyles, and wealth creation of cities and regions. This is a major trans-disciplinary task for the coming decades. ●

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Highway transformation projects have a strong symbolic impact because they affect objects traditionally connected with the idea of freedom and modernity.



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6-7 Montreal: the Buonaventure Highway, before and after the viaduct was demolished with a positive impact on the environment.

8 Paris: former Left Bank Expressway, now a pedestrian and cyclist promenade. Image by Paul Lecroart, IAU



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