

Chapter 2

The Greater Paris Metro Project: Characteristics and Challenges

Jean-Claude Prager¹

Abstract

In this brief introduction, the author will highlight the two important characteristics of our project and our overall challenge of carrying out a robust assessment of its socio-economic impact, and then he will ask four questions which seem to him to be fundamental.

The Greater Paris Metro represents a considerable structural change which will cut a number of journey times by 50%. This metro thus poses new questions about the scale of threshold effects in public transport.

¹ Société du Grand Paris.

1. The large scale of the planned investments

In this brief introduction, the author will highlight the two important characteristics of our project and our overall challenge of carrying out a robust assessment of its socio-economic impact, and then he will ask four questions which seem to him to be fundamental.

The Greater Paris Metro represents a considerable structural change which will cut a number of journey times by 50%. This metro thus poses new questions about the scale of threshold effects in public transport.

The Greater Paris driverless metro is made up of about 175 km of new lines and roughly 60 stations. It will expand the size of Paris' current metro network by 70% and will make it possible to carry 2 million travellers per day (the current metro network extends for about 215 km with 300 stations and carries 4 million passengers every day). Trains on the Greater Paris metro will move at an average service speed of 65 km/h, which is three times the current service speed of the metro. The frequency of metro trains will be flexible, with intervals of as little as 85 seconds between trains at peak times.

Today, 70% of journeys in Île-de-France are made from suburb to suburb, and 80% of the latter journeys are made by car. The Greater Paris Metro will also make it possible to avoid passing through Paris when going from one suburb to another and will reduce passenger numbers on all lines of the current metro network by 10-15% on average. The burden on some lines of the network could decrease by as much as 25%, as in the case of Line 13, and 30% on the central part of the RER. It will be possible to travel to the three airports and TGV stations easily from all points within the Paris region. It has also been ascertained that between 10% and 15% of users will abandon their cars and take to public transport.

The general outline of the project was approved by the Government in August 2011.

2. The Greater Paris project is also a major development project

The explicit aims of the Greater Paris Metro are to encourage the economic development of the capital region by improving the attractiveness of the area, the operation of the job market, interaction between socio-economic actors, and the creation of a network of centres of excellence and development across the region.

Our project thus forms part of a new policy of growth and innovation in the Île-de-France region. This policy also entails restructuring the region's major universities and an innovation strategy in line with the priorities set out in the European Union's Lisbon Strategy, and a strengthened housing

construction policy to support this growth. This policy is intended to address the issues raised by the shortfall in the return on investment of the region's innovation powerhouse by comparison with Tokyo, London and New York. The region has considerable potential: the number of researchers, the diversity of its industry and services, its rich fabric of artisans and small and medium-sized enterprises, the power of its industrial sectors, its attractiveness to foreign investors, the number of major company headquarters, and its strength as a world-class financial, cultural and tourist hub. Yet the innovation powerhouse of the Île-de-France region yields a lower economic return than those of London, Stockholm, New York and Los Angeles, not to mention Silicon Valley, due to the inadequate interaction between research and the business world in the Île-de-France region, among other reasons.

In addition, the areas of the region are highly disparate and poorly connected to each other and their airports, and as a result, the lack of internal mobility within the region is an obstacle to the movement of ideas and workers and the optimisation of initiatives and human resources. A city, understood as an urban area, is the perfect example of a place that makes connections between actors possible and facilitates them. The infrastructures envisaged by the Greater Paris project are apt to facilitate interconnections between areas, and hence to boost the efficiency of the exchange of people and ideas and encourage agglomeration forces.

3. The challenge: adapting evaluation methods to a large-scale project

The first aim of the infrastructure is, therefore, to contribute to a positive “growth shock” for the region and the country, over and above the usual benefits of transport investments.

In France, as in most OECD countries, infrastructure projects which are financed with public money are subject to a public inquiry, which includes an evaluation of the economic and social effectiveness of the operation. This project evaluation includes a provisional assessment of the benefits and disadvantages caused, whether directly or otherwise, and an estimated rate of return for the local authority. The assessment calculates the updated amount of all anticipated monetary or monetisable costs and benefits and also impacts that cannot be quantified, or hence expressed in monetary terms. The evaluation must state the project's impact on the various economic operators concerned, customers of the future metro, businesses, the State and other public authorities and, more generally, the entire population.

The first evaluations of the socio-economic returns – which were carried out in 2010 using standard approaches to evaluating improvements in accessibility and agglomeration effects – pointed to a promising return from the project. However, we have not yet been able to quantify all of the effects of this new metro, and the margins of uncertainty for the calculations are quite great.

To appraise the socio-economic impact of such an innovative project, which anticipates the future growth of the region in all of its aspects, we must therefore evaluate phenomena which we know are being debated by experts. We are in a grey area of knowledge and the calculations are inevitably subject to a high degree of uncertainty. Our aim is therefore firstly to explain the terms of the debates on the basis of current knowledge.

In this brief introduction, the author will present some important issues which concern us.

Question 1: The role of mass transport infrastructure in the growth of areas is a debate which is still inadequately documented

Since one of the reasons for creating the Greater Paris Metro is its impact on growth, it is crucially important to provide points of reference with regard to the link between transport infrastructures and economic growth. The overall link between the level of public capital and growth, such as between transport infrastructures and growth, is documented in general terms even though the overall conclusions may spark lively or even somewhat ideological debates. The literature tends to conclude that there is a positive link between infrastructures and growth in the long term. The elasticities that have been calculated may be significant. However, the impact of infrastructures when considered separately is highly dependent on the exact nature of the infrastructures and calculation methods. In a nutshell, it can be highly variable.

The issue of the mutual influence between transport investments and the growth of areas is a matter of debate; there is a causal relationship in both directions. On the one hand, urban development is supported and anticipated by means of transport facilities, and in the other direction, some infrastructures help to shape and anticipate the expected development of cities. Since they are usually difficult financial choices, decisions concerning infrastructures are based on criteria of rapid returns and therefore tend to favour the construction of transport networks in areas which are already densified. So it can be said that infrastructures which respond, *ex post*, to the transport needs created by development, which “support” this development, apparently produce a bigger economic impact and return in the short term than infrastructures which anticipate the development of urban areas and tend to shape them because the number of people using them is necessarily lower at first, until their long-term effects on urban structuring make themselves felt.

In the past, some transport infrastructure planning decisions have had considerable long-term effects. For example, one may ask what the urban growth of large metropolises such as London, New York and Paris would have been like and what the forms and costs of congestion in them would have been today if the first key decisions on their metro networks had not been taken during the second half of the 19th century. It would be interesting to have an *ex-post* economic assessment of these decisions and to compare them with the calculations that could have been performed, *ex ante*, on the basis of traffic forecasts made according to mobility and location behaviour at that time. Perhaps such studies have been carried out, but we are not aware of them.

The issue, therefore, is being able to characterise these major projects in advance, and the way in which their economic effects can be assessed.

Question 2: How to characterise major infrastructures and assess their effects?

These major infrastructures, which constitute very long-term decisions, such as the Greater Paris Metro, are disruptive infrastructures which may be described as “public policy shocks”. They raise the issue of the limitations of applying standard transport models.

Major transport infrastructures are actually much more than mere incremental improvements to existing networks; they are infrastructures which are unique by virtue of their immediate consequences, especially in the long term. This is true in the case of, for example, creating complete bypasses around metropolitan regions which are still partially served, or creating the first rail-based public transport system in a metropolis which did not previously have one (e.g. the metro networks of London, New York or Paris at the end of the 19th century), or creating a system with highly

innovative features (high frequency, automation, high speed, etc., as in the case of the Greater Paris Metro).

For these infrastructures, it may be considered that the overall effect is markedly greater than the sum of the effects taken separately from their components and that we are dealing with steeply-curved parts of demand functions where the effects can be very great and underestimated by models which, all too often, are still linear.

For example, the construction of a peripheral circular ring should normally have effects greater than four times the economic impact of building a quarter of this ring. The difficult part is assessing the economies of scale in the production function, and to what extent and under what conditions these economies of scale may manifest themselves. Specifically, it is necessary to measure the difference between the impact of, for instance, 200 km of additional extensions to metro lines and that of a new and different system; for example, a set of radial and interconnected lines such as the RER in the 1960s or rings as in the case of the Greater Paris project, with radically different technology, allowing for much greater time savings than the usual 5% or 10%. We must also assess the conditions in which these economies of scale can be amplified by appropriate urban policies or, conversely, in what conditions competition may arise within a single mode of transport, a phenomenon known in industrial organisation as “cannibalisation”.

The economic and social effects of major projects are multiple and complex, and standard calculations of increases in accessibility based on transport models only capture some of the impacts, even if one decides to incorporate aspects which are not normally clarified, such as increases in productivity related to agglomeration effects, supporting the emergence of new, secondary centres.

A parallel can be drawn with analysing the economic impact of a radical innovation. To assess the value of this innovation, it is necessary to measure repercussions in very varied fields of economic activity, which arise only in the long term and were not necessarily foreseeable when the innovation came about.

To clarify the public decisions to be made in this area, it is necessary to consider all possible effects over the very long term and to try to establish their relative importance without exceeding the bounds of scientific plausibility.

Question 3: How to measure the effects on prosperity caused by urban facilities?

Major public transport infrastructure projects have a significant effect on the form of cities, but this effect is ambiguous. Transport infrastructures simultaneously encourage urban sprawl of an entire city and a certain amount of densification around stations, which experience surplus demand for land.

The driverless metro network must, therefore, also contribute to polycentric development (polycentrism being the opposite of monocentric polarisation).

As is the case with most other cities, the urban sprawl of the Paris region is linked to the way in which the conflict between housing areas, land prices and travel costs and times is settled. A certain preference for private transport was, *de facto*, encouraged between 1960 and 2000 by population growth, the improvement in living standards, the fact that petrol prices remained relatively low despite oil shocks, the construction of two major ring-road infrastructures, and the near-absence of any regulatory or tax measures tending to keep urban sprawl in check. These dispersal factors were sufficiently powerful to counterbalance the polarisation or control of urban sprawl that should have

been caused by the construction of the Réseau Express Régional network, associated with a new towns policy which was adopted during the 1960s.

The context of the Greater Paris project is different. The use of available land within the small inner suburbs of Paris and the improvement in the density of the public transport network, have already made it possible to support a certain amount of re-clustering of population and employment. The aim of our project is to ensure that population and employment growth, which will represent 15% to 20% of the current population and employment levels, will primarily be concentrated, over the next twenty to thirty years, in ten or so secondary centres. These centres will have full urban functions and will be well-connected to each other and to the Île-de-France urban centre, thanks to an ultra-fast and efficient means of transport. The choice that has been made is not to block urban sprawl, which would require the implementation of very strict regulatory measures and could lead to a loss of social efficiency, but to accept the continuation of the controlled spatial development of the urban area. Oil price forecasts suggest that petrol prices will remain high, and this will therefore boost the return to public transport in the long term.

The regulations concerning infrastructure projects require us to assess these effects in terms of social wellbeing.

Effects are firstly seen in the expectations of economic operators, especially land agencies, and the value of land. The effect also continues over the long term, once the infrastructure has been created. Polarisation is more marked around stations and nodal points of transport systems in terms of population density and land values. It seems to be all the greater when the investment is a strategic decision for future development than when it supports continued urban development which is already under way or existing needs which are poorly catered to.

We will calibrate land-use models which are simulation models, such as UrbanSim, or general equilibrium models such as Relu Trans, to evaluate the effects that the metro's creation will have. We know what these solid and established techniques can give us and are counting a great deal on the support of Professors Anas and Waddell, who are the fathers of these analyses, to help us to evaluate these complex issues.

Aside from the overall analysis of foreseeable effects, the literature is relatively modest when it comes to quantifying the economic benefits of greater control over urban development. The existing literature tends to support the idea that the urban policy proposed for Greater Paris is a second-best option. But our challenge is to quantify these benefits. We need to know what polycentric development will bring in terms of social wellbeing and reducing wealth and income inequalities as opposed to monocentric or diffuse urbanisation. Parts of the answer already exist, as far as polarisation of economic activities is concerned, thanks to the literature on agglomeration effects. The effects on residential polarisation are less well documented.

Question 4: How to estimate the effects of improving the international competitive position of the Paris urban area?

Analysis of the impact on growth must distinguish between internal growth of areas and growth linked to greater attractiveness of the metropolis in terms of mobile resources (major property investments and industrial or research investments). This major issue concerns the geographical factors of urban development and the role played by the expectations of economic operators in the long-term growth of cities. We can already see an increase in the external and international attractiveness of the urban area through multiple contacts. The announcement of a major policy and a

new policy of stimulation are a signal which is changing the expectations of economic operators, and especially industrial and property investors who can anticipate the future advantages of locations, contribute to polarisation around transport nodes and hence boost the economic and social effects of urban agglomeration. But empirical evidence of the influence of infrastructures on the attractiveness of mobile resources is still poorly documented even though this is probably one of the keys to the surplus potential growth of the urban area.

Part of our problem, therefore, stems from the difficulty of evaluating the effect on our share of the market of “footloose” international activities with high added value.

In conclusion, for the time being, our response can only cast partial spotlights on these complex issues, bearing in mind the need for diversified approaches in the absence of a central method which is recognised by all.



From:
Major Transport Infrastructure Projects and Economic Development

Access the complete publication at:
<https://doi.org/10.1787/9789282107720-en>

Please cite this chapter as:

Prager, Jean-Claude (2014), "The Greater Paris Metro Project: Characteristics and Challenges", in International Transport Forum, *Major Transport Infrastructure Projects and Economic Development*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789282107720-3-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.