



Decision Network: Who Decided What in the Building of the Paris Métropolitain, 1898-1920

Pascal Desabres

In this paper, I study decision-making during the building of the Parisian subway. I sought the answers to questions concerning important decisions such as: who was the most important actor, among a trio that included private entrepreneurs, the capital's complex double Administration, and the public works engineers (City employees working closely with the entrepreneurs to build a new mass transportation system in Paris)? Reviewing all the daily documents (such as engineers and Prefect's reports, entrepreneurs' letters, and complaints) helps provide a response to this question. A careful reading allows us to discover how and why the entrepreneurs formed an alliance against the City, and if the polite relations between City and Department men (the administrative territory) were harmful or beneficial. One figure stands out among the engineers: Fulgence Bienvenüe, whose influence went beyond his function as Chief Engineer, even as he defied the rules. I also hope to contribute to the understanding of the use of the notion of network in public works history, for which there is plentiful evidence in the administrative papers, if arranged in a meaningful order.

Dominique Larroque recently drew up two schemes of two different decision networks concerning whether the Parisian subway line would have local or national status.¹ We can describe some elements in such a scheme. We are not concerned with the status of the network, which, once the building began, was resolved.² According to Jean Carassus, there are

¹ Dominique Larroque, *Paris et ses transports XIXe-XXe siècle*, (Paris, 2002), 64.

² We studied this point in an other paper, "The Parisian Subway during the 1880-1900 Period: A Local or a National Interest Line? On the Concept of Globalization," BHC/EBHA joint meeting, Lowell, Mass., 17-19 June 2003. Paper on line on the BHC website. Concerning the debate about the status of the

Pascal Desabres is a Ph.D. student in History at University Paris-Sorbonne.

four steps in a building project.³ The first is financial: how and where to find the funds? The second is conceptual: the drawings of the final project, and all the legal aspects, contracts, sharing of responsibility. The third step is construction, divided into four sub-steps (installation; building; supply networks such as water and electricity; and completion). The fourth step is acceptance. I focus on the last two steps, after political and legal decisions have been made, when it is time to enforce rules and laws.

After decisions are made and votes taken, the number of actors with real decision-making power is reduced. The various councils gave their advice before the vote. After the Parliament's decision, it is time to build, which is the duty of the City's engineers, collaborating with the entrepreneurs, within the limits of very precise procedures.

What is a decision network? It is a decision process that is not necessarily linear. At some steps in a decision-making process (for instance, the building of a tunnel, or payment of an entrepreneur), one can go back to the previous step. At the same time, the notion of network includes the opportunity for its actors to refer to a superior authority in case of disagreement.

Three actors were involved in the building process: the entrepreneurs, the City administration, and the Prefect's administration. The coexistence of two different administrations sometimes complicates the typical process. Each of these three actors has power in the decision, at each step of the construction process, that is, from the project's beginning to the final accounting. However, each does not always have the same power, or, more accurately, their maximum power at each point in time. Legally, the Prefect's staff is the court of last resort. In practice, the steps are rather different.

About the Sources

The Métro is a perpetual construction site. The administrative process is begun again for each new line: numerous discussions of the project, entrepreneurs' bids for the contract, the actual construction, and payment. All four great steps mentioned are apparent in these documents. Each step of the process is made under the authority of the public administration, and that is why all administrative aspects of the Métro's memory are in the public archives. The most important archive is the *Archives de Paris et de l'ancien Département de la Seine* (APADS). The name itself explains the complexity of the situation: Paris is both a Municipality and a department, which existed until 1976 under two

Métropolitain railway in Paris, see Michel Margairaz, *Histoire de la Ratp*, (Paris, 1989), in particular on pages 16 to 21.

³ Jean Carassus, *Construction: la mutation* (Paris, 2002), pl. 8, p. 85.

authorities, of which the Prefectoral is the highest. This is an important point in our reading of events.

From the perspective of analyzing the decision network, these archives are very well stocked. The technical aspects are not so obvious; in this paper, I focus only on the administrative aspects.

Tender: When the Market Has the Power

Once the project is accepted and the public usefulness law is voted on, the contest is opened to entrepreneurs. It is based on very precise specifications. Nothing is left to the imagination: this is not an architectural contest. A first choice is made from among the pre-contestants. The jury takes considers a variety of elements; for example, the entrepreneurs' experience and their technical solutions. With respect to experience, only a few companies are skilled in railroad building and tunneling. In addition, there are few technical solutions, because the prescriptions are very restrictive. It is a "closed tender," that is, the choice is made based on the discount rate proposed on the price given by the Administration. That is why there is a preliminary selection of contestants, and why the prescriptions are very strict. Each entrepreneur is proposes a discount rate by secret bid. The highest discount rate wins the market.

Depending on the context of the construction market, the entrepreneurs then find themselves in either a strong or weak position. In 1898, for example, Paris was a huge construction site. During the Universal Fair preparations the Grand and Petit Palais were built in a few months in 1899, just two medium-sized examples of buildings that remain today. To these we can add the building or repair of some of the main city sewers, and the expansion of the national railroad networks.⁴ Thus, an entrepreneur who could not get into the market through the Métro network certainly could get in elsewhere. In this case, the discount rates were very low. On Métro Line 1, in 1898, the average discount rate for the building was 1.28 percent per lot. In addition, this figure is based on a second tender, because the first one, on August 6, 1898 failed. The contestants' offers were 20 to 50 percent higher than the price proposed by the Administration.⁵ The City was forced to accept the contestants' offers and to pay the maximum price. Just a few years later, the only important construction site remaining was the Métro. Reaching an agreement was harder. The numbers were explicit: the average discount rate on Line 2 reached 20.4 percent.⁶ In 1905, the average discount on

⁴ See Philippe Cebron de Lille, "Les eaux et les égouts à Paris au XIXe siècle : évolution technique," in *Paris et ses réseaux*, ed. BHVP/Hotel de Lamoignon (Paris, 1990), 101-137, in particular 123-132.

⁵ APADS, V2 O8 2, from the documents about the tender for Line 1.

⁶ Based on APADS, V1 O8 9.

Line 4 is 34.16 percent.⁷ However, this figure is based only on the successful candidates, and not on all the proposals. We know the chosen proposed the higher discount rate. The narrower the market, the higher the discount rates. At first, the most influential actor can be the entrepreneur, only if the demand exceeds the offer. Comparing the discount rates for Line 1 and Line 2, Bienvenüe wrote: “We know the works on this line [1], made during a difficult period, did not give any opportunity during the submissions, to the usual savings (...) it happened differently for the Line 2, which markets, negotiated just after the Universal Fair, have been passed in very favourable circumstances.”⁸

Bienvenüe is on the City’s side. The “favourable circumstances” for him represented a very limited market for the entrepreneurs. We could say that the most powerful actor is not really in our decision network, but is the market itself. This could be. However, in practical terms, let us consider the “actors” as human beings and the market as a context, just like the law, which defines the infinity of possibilities in a strict structure.

Building: The Most Skilled Have the Power

Certainly, the prescriptions bestow great power upon the Administration’s men (whether they belong to the City or to the Prefecture). However, on the ground, on the site, the entrepreneur and workers are the masters. It is their duty, for good or ill.

City employees conducted inspections to determine if regulations were followed, and if the buildings would last a century. Inspectors wrote short reports (2-3 pages) about their visits. I found only two examples of such reports, and they mainly dealt with a quarrel between a worker and one of the two inspectors.⁹

There was no quarrel, however, between the City’s engineers and entrepreneurs during the actual construction. Engineers and entrepreneurs did differ in their *curriculum vitae*. The fact that engineers were usually more highly-educated than entrepreneurs, however, did not mean that entrepreneurs did not have diplomas. In the end, they both dealt with the same reality: mud, rocks, danger, and the need to avoid increasing expenses. Leaving theory and calculations behind, they were both trying to find solutions to the same problems, using the same vocabulary, and, sometimes, innovating.

Line 4, which crosses Paris from south to north, represented a different case. The decision network was radically modified. Between

⁷ Based on APADS, V5 O8 5.

⁸ APADS, V1 O8 11, Report on the account for Line 1, lots 5,6,7 and 10, 28 Jan. 1902.

⁹ APADS, V1 O8 9, Inspections on 13 and 18 Dec.1898, and 26 Jan. 1899. We study precisely these reports in “The Notion of Construction Site in Contemporary History: The Example of the Paris Métropolitain,” *French in Histoire, Economie et Société*, in press.

August 1905 and May 1907, when the line was to cross under the river Seine, the tunnel construct interrupted ship traffic.¹⁰ Indeed, the technique used, “caisson,” involves first building the tunnel on the shore of the river, bringing it in position on the river and sinking it. Precise description of this spectacular process is beyond the scope of this paper, but it is important to note that this technique is very disruptive of traffic. At this point of the river, where the Island of the “Cité” stands, two arms surround the island, and boats pass through the Great or the Small arm depending on whether they are headed east or west of Paris. If one of the two arms is closed, all traffic is stopped, which is what happened during this point in the building of line 4. The Seine is a national route, under the authority of State, not the City. Thus, the Minister of Public Works had to give permission for Line 4 to cross under the Seine. Some other lines crossed the river, but none using the caisson technique. The other lines either crossed the river underground or on a bridge. Although bridge construction disturbs traffic on the river, it does not totally stop it. This is the only instance I know of when the usual decision network rules changed.

Payment: The War of Departments

When construction is completed, the administration gives final approval by paying the entrepreneur, or, more precisely, paying the balance due. The entrepreneur presents a detailed account for each lot. This document is based on official prices and tariffs accepted before construction began. Entrepreneurs claim more than they were promised, arguing that they met various obstacles and difficulties. There is nothing unusual about this; it is the usual game. Theoretically, the City’s administrative role is limited: it has only to transmit it to the Prefect. However, Bienvenüe and his staff often negotiated to reduce the amount due without consulting the Prefect, who was the only one authorized to make such decisions. When Bienvenüe negotiated and signed the accounts, he not only committed the City, but also the Prefect, whether he agreed or not. This is the heart of the decision network concept. Overall, the accounts Bienvenüe accepted were usually much more generous than the Prefect would have liked. Why did Bienvenüe evade the Prefect’s advice? Not, I argue, to ignore the rules but for two complex reasons.

Day in and day out, the City’s engineers work hand-in-hand with the entrepreneurs. They know each other very well and can be sure they will need each other in the future: for new works, the Métro, or perhaps some sewers, for example. Bienvenüe knows that generosity, rather than losing money, is an investment in good negotiations for future work. There are not many sharp-skilled entrepreneurs in Métro building. This

¹⁰ Ratp, Bienvenüe’s monthly report to the Métropolitain Commission at the Municipal Council, Aug. 1905 and May 1907.

link is apparent in a single word in a document regarding two entrepreneurs accused of depredation of parts of the municipality's water network. The City's chief Water Department engineer wrote: "Transmit it to the Works Director, requesting him to pass on to the Chief Engineer in charge of the Métro, whose advice could be interesting, before taking proceedings against one of *his* [emphasis added] entrepreneurs."¹¹

This City engineer knows how close the relationships can be between entrepreneurs and engineers. The very important "his" emphasizes the link existing between the engineer and the entrepreneurs. As far as he is concerned, he accepts the fact that Bienvenüe, almost like the private boss of a team, has his men, even if, by law, the relationship is strictly defined and the only link should be professional contacts to complete the prescribed job. Bienvenüe has "his" entrepreneurs in a world where any other engineer theoretically could replace him. However, after years of working together engineers and entrepreneurs become close and this human factor can alter the initial decision network and even lead to corruption (although I should emphasize I did not find any evidence of corruption in the building of the Métro).

Second, this bypassing provides a piece of evidence of the ancient conflict between the City and the State, represented by the Prefect. This opposition was also sometimes rude. We can see its appearance in some reports written by the Prefect's staff. Even when Bienvenüe negotiated alone and without any authorization, the Prefect's administration had to write a report on what he would accept as payment, if Bienvenüe had not accepted another account. These reports could not change anything, because Bienvenüe's agreements *de facto* engaged the City and the Prefecture to pay. From a strictly legal point of view, we could consider these Prefect's reports as a "diplomatic protest." Perhaps this is why, because they lack of any influence, that these reports are so explicitly scathing: "It is important to understand that the Métro's technical department must respect the rules explicitly stated in the circular of January 13, 1903, written in response to its own erring ways. This Department must renounce these execrable practices (...) and resolve on its own the difficulties in the building that are causing new expenses."¹² The 4-year-old respectful opposition between Bienvenüe and the Prefect's staff suddenly stands out. Little by little, the relations between the City and the Prefect's Works Department seem to get better. In November 1904, the Director of the Prefect's Works Department was about to agree to a final accounting. However, some elements remained unexplained. The Director wanted more precise information concerning these points: "I am requesting Mr Bienvenüe to give me this information," he wrote at the

¹¹ APADS, V3 O8 2, Clerk of the works' report on destructions on Line 2, made by Lamarre & Senton, entrepreneurs, 1903.

¹² APADS, V2 O8 11, Prefect's report on account of Lines 2 and 3, 13 Jan. 1905.

end of his report on this account.¹³ This was a very polite request, and signaled the end of the quarrel between the Prefect's and the City's Offices. However, notice the way the Director addresses Bienvenüe, referring to him only "Mr. Bienvenüe," instead of by his title, Chief Engineer, Chief of the *Métropolitain* Department, as the usual administrative rules required. Omitting his correct title is a sign of loathing, or a way to indicate precisely who the chief is in the last analysis.

Once again, even though we would think that time would have dimmed the issue, in 1905, the quarrel re-appeared. Contesting an increase in an account regarding Line 3, the Department in charge of inspecting the accounts once more protests against Bienvenüe: "As we can see, these increases are reaching an important amount, revealing allotments allowed by the engineers, probably in response to entrepreneurs' unofficial claims. This account (...) follows the same old erring ways."¹⁴

Indeed, it was this Department's duty to contest the increases and to identify those responsible, because they considered an increase a mistake. However, we can see that Bienvenüe and his methods—being closer to the entrepreneurs, and, at the same time, bypassing the authorities—were very often criticized.

Bienvenüe was the center of the network. When he became Chief Engineer in charge of the building of the *Métropolitain* in 1898, he was beginning his 26th year as engineer, 15 with the City of Paris.¹⁵ Bienvenüe should have retired in 1922, but in response to the demands of the City Council and some suburban elected officials, the Public Works Minister extended his active life. He did not retire until December 1932, after 59 years in public administration, a career of exceptional duration.¹⁶ This is evidence of Bienvenüe's importance in the construction and decision network; he was a very good engineer, very accurate, a diplomat when necessary, and he knew everyone involved in the works. He was, in the end, both the memory and the moral authority of the decision network. Although this was not his legal role, Bienvenüe did not overstep his functions and his position. The station Montparnasse was renamed the "Montparnasse Bienvenüe" in 1933, while the engineer was still alive, something that never happened before or since.

Of course, Bienvenüe was not alone. He had several assistants during these years, but only one became Chief Engineer. All the others retired before Bienvenüe. He had six other engineers under his

¹³ APADS, V3 O8 2, Works Department Director's note to Bienvenüe, 11 Nov. 1904.

¹⁴ APADS, V3 O8 8, Advice of the Inspector in charge of the control on accounts, concerning an account for Line 3, Sept. 1905.

¹⁵ APADS, V1 O8 9, written note about Bienvenüe, circa 1898-1899.

¹⁶ Claude Berton and Alexandre Ossadzow, *Fulgence Bienvenüe et la construction du Métropolitain de Paris* (Paris, 1998), 202.

management. However, from an historical point of view, he remained the only great character on the administrative side of the Métro epic, opposite the famous names of early twentieth-century French public works entrepreneurs like Cagnaud, Cail, or Fougerolle. In addition, his longevity demonstrates even more convincingly than his career that the building of the Métro was not only a technical or administrative venture. It was perhaps, above all, a human challenge. Bienvenüe, better than any others, met that challenge.

Conclusions

In seeking new answers and analysis, only the original archives provide adequate breadth for historical research. Although there were very precise procedures for the Métro building process, we see that it was the human factor in these longtime relationships that was necessary for this long-term building project. The creators of these procedures were sometimes the first to circumvent them. That is why the moral authority of law is so important.

The complex route from initial project to final construction requires that what is to be built should be built well. The more complex is the decision network, the more supervision the final product requires. Although this is not a rule for every product, it is for construction.

Bienvenüe's performance shows that the decision network involved in building the Métro was above all a technical network, even if, officially, it was primarily an administrative one. The technical aspects were secondary to the City and Prefect's administrations. Yet, on the ground, they were the most important aspects. Bienvenüe acted as a highly-skilled technician. It is obvious that the Prefect and the City Councillors knew nothing about these technical aspects; it was not their duty. By defying the rules, Bienvenüe revealed the importance of the technical network, hidden, but efficient and absolutely necessary.