

Everyday carpooling, technological and societal aspects

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Abstract:

Given the massive growth in long-distance carpooling, the prospects of reproducing this trend for the 600 billion passenger-kilometers per year by car for trips of less than 80 km have attracted several players to the market for short-distance carpooling. The mounting difficulty of covering the costs of daily trips and the determination to limit their environmental impact have not sufficed to turn this potential into a profitable business model. What levers to use so that carpooling for everyday trips becomes a reality?

Short-distance carpooling: Informal and varied

For more than ten years, Coralie and Eric have carpooled together every morning to go from Cambrai to work in Lille. Costs and fatigue motivated them to make this choice. As Coralie explained, *“Eric and I have an hour on the road morning and evening.”* Although 30% of the French say that they have resorted to carpooling during the past twelve months, this percentage covers quite different situations.¹

A few characteristics set short-distance apart from long-distance carpooling:

- For short distances, 41% of persons involved in carpooling are, at times, drivers and, other times, passengers (IFOP 2017).
- 35% carpool at least once a week; and 65%, fewer than four days a month (IFOP 2017).
- The persons using a carpool for the home-work trip are, on the average, older than those who use long-distance ride-sharing services for weekend trips or vacations.
- Most users of short-distance carpooling work, and some own a car. The average age when the first car was purchased has constantly decreased.
- More persons carpool daily in areas not serviced by public transit. Public transit connections are a drawback for short, frequent trips.
- More than 60% of the persons living in urban areas fewer than 100,000 inhabitants use a car to go to work, as compared with 33% in the Parisian metropolitan area (CGDD 2016a).
- For long-distance carpooling, people are more willing to go meet a driver in a far part of the city in order to save on a journey that will last several hours.

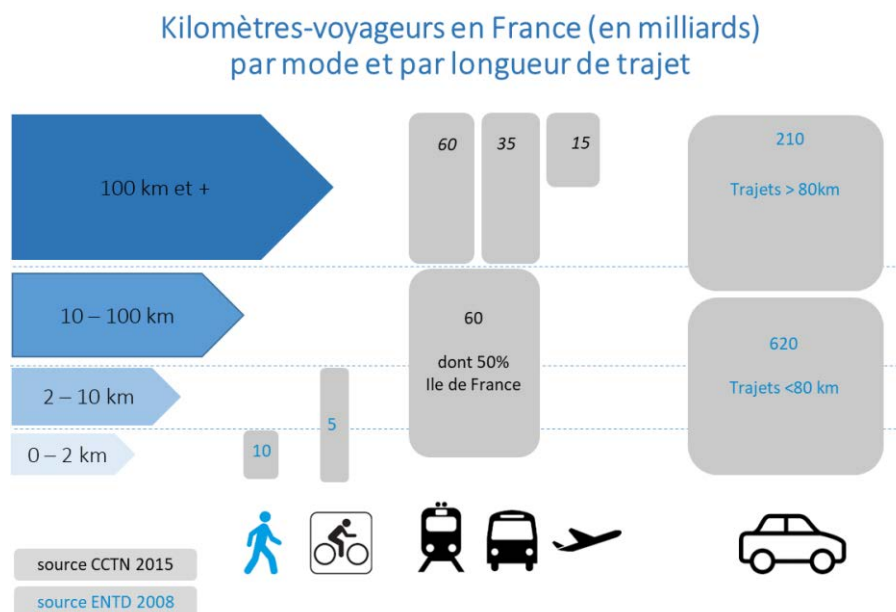
Despite its potential, carpooling is an informal practice not well developed. The occupancy rate per car for commuting (home-work journeys) has stagnated in European countries between 1.04 and 1.2 persons (CGDD 2014).

¹ This article, including quotations from French sources, has been translated from French by Noal Mellott (Omaha Beach, France). The translation into English has, with the editor's approval, completed a few bibliographical references. All websites have been consulted in October 2019.

A great potential with positive spinoffs

Since daily trips are frequent and mostly made in a car with no passengers (apart from the driver), they offer an opportunity to change practices, at least for certain destinations (CGDD 2016b). Some players see this as a business opportunity; others, as an opportunity for reducing CO₂; and still others, as an opportunity in mobility, since carpooling could help relieve traffic congestion by fostering shared forms of transportation in local areas.

Figure 1: Passenger-kilometers (pkm in billions) by mode of transit and by length of journey in France



However only half of the users of short-distance carpooling go through an online platform (CGDD 2016a). To tap the potential of electronic technology, it is necessary to: gain leverage from key features in digital technology, design incentives (in particular via infrastructures), and make it easier for people to plan trips. These arrangements would make a massive use of carpooling possible, this being a prerequisite for developing a business model (which will necessarily differ from that for long-distance carpooling).

The user experience

What is to be done:

- **BUILD TRUST:** Users' expectations for commuting extend beyond confidence (a characteristic and, of course, prerequisite of peer-to-peer platforms) to the question of reliability. Users want to be "on time, anywhere, everyday". During strikes in the spring of 2018, satisfied users who contacted iDVRROOM's customer service mentioned punctuality, cleanliness of the car and prudent driving more often than the friendliness of the vehicle's occupants. In addition, users wanted to be sure they would have a ride back home in the evening.

- FOSTER CARPOOLING WITHIN THE USER'S INNER CIRCLE: Belonging to a group or community (school, firm, etc.) breeds trust and increases the chances for sharing rides.
- FACILITATE CARPOOLING: Software for planning trips and following accounts can provide assistance to persons who regularly use carpooling services. When people take turns driving, the platform can remind them of who owes how much to whom at the end of the month as a function of their turns as driver or passenger.
- CONNECT A CAR FOR INSTANT SHARING: Many drivers are willing to share a ride but do not give advance notice lest they have to alter their plans for the journey. For this reason, iDVROOM worked with Renault to make ride-sharing as simple as a click on the car's navigation screen.
- ACCESSIBILITY: As paradoxical as it might seem for a "digitally native" service, carpooling must be made easier for persons who do not have a smartphone or do not feel comfortable with mobile applications, but who would like to share rides. On iDVROOM, 40% of uses are via the Web, clear evidence of this platform's nationwide presence. In addition, the number of uses planned for the week is significant.

Solutions (such as Stop Connecté) based on text messaging are being proposed in Switzerland and France. A message sent to a short number triggers the display of the destination. When an automobilist stops to pick the passenger up, the passenger sends his license plate number to the short number. This message, which is surcharged, enables the driver to be paid. These solutions are promising even though they are still not often used.

The technology for short-distance carpooling

To reach a critical mass faster, many businesses are concentrating on dense zones and home-work commutes. For this, they target persons who are used to instant services.

GEOGRAPHICAL PRECISION AND REAL-TIME CALCULATIONS: A much greater computational capacity is needed to make real-time calculations for short-distance rides than for long-distance trips. Long-distance ride-sharing has grown, along with the websites that compare train or airplane ticket prices for city-to-city destinations. In contrast, short-distance ride-sharing means a precise address at a distance ranging from 500 meters to 15 kilometers (on iDVROOM). In Île-de-France Region, the address is somewhere in more than 1200 communes with more than 25,000 bus stops. The intent is to connect areas poorly served by public transit. The whole architecture would have to be altered to calculate a real-time detour so that driver and passenger meet. Some operators skirt around this problem and display on their apps the itineraries of drivers already on the way to make a pickup. A user can then visualize where vehicles in his vicinity are heading, contact them via the app and ask the driver to make a stop along his itinerary.

PAYMENTS FOR MULTIPLE PETTY TRANSACTIONS: For recurrent uses of short-distance carpooling, the user has to frequent pay small amounts: from 50 cents to €5 for trips 5-50 km long. To use carpooling like a bus, users should not have to take out a payment card for each trip, or to have the exact amount of spare change for the ride. An efficient solution is for payment by e-wallet or mobile telephone. Financial incentives for carpooling entail managing several small amounts subject to the conditions set by sponsors (such as Île-de-France Mobilités which, in the greater Paris area, partly covers the costs of carpooling trips during strikes and on peak pollution days). Carpooling is a peer-to-peer service subject to conditions. The passenger pays in advance (thus reassuring the driver), but the payment is placed in a reserved account and then, after the ride, transferred to the driver's account.

Incentives

Incentives, financial or linked to the infrastructure, motivate fraudulent behaviors that have to be detected without inconveniencing honest users. Striking a balance between the fluidity of the user experience, the efficiency of incentives and the control of fraudulent practices is an ongoing effort.

Since the passenger's propensity to pay is not on par with the earnings expected by the driver, incentives must be introduced for short-distance carpooling. Several methods have been or are being tested. Here are a few examples:

- During episodes of pollution in 2017, the mayor's office in Paris decided that only cars carrying at least three persons would be allowed to come into the city. Within a few minutes, traffic on iDVROOM's website shot up fourfold (before communications with the user base).
- Experiments with free trips for passengers and with driver subscriptions have not been very conclusive for striking a balance between efficiency and the control of fraudulent practices.
- For a kilometer-based compensation for carpooling, regulations would have to be changed to motivate drivers (who already benefit from kilometer-based indemnities) to make fewer trips.
- Access to reserved infrastructures is a method long used in the United States but recent in France. ATMB has opened a lane for carpooling and also reduces fares for carpool vehicles. When traffic is already saturated, reserved infrastructures have a negative impact on those who do not carpool, since they are deprived of part of the roadway.

These incentives raise sensitive issues about controls, fines and sanctions.

The business model

The French Agency for the Environment and Energy Management (ADEME) has reported more than fifty initiatives in this field, and 17 operators have joined the carpooling program of Île-de-France Mobilités.

A 10% commission on the ten million short-distance trips (at, for example €3/trip) would amount to €3 million in sales. Short-distance carpooling does not, therefore, turn a profit for the service (or website) that brings people into contact with each other, at least not when the only income comes from users — not even in a market with a few players. Furthermore, there are two obstacles to increasing the platform's income. For one thing, regular carpoolers have no interest in repeatedly paying for the contact. For another, the acceptable level of commissions depends on the value of the service of bringing people into contact — but as perceived by users. As pointed out previously however, the value perceived by passengers and by drivers is not yet on par with the technology that is being used. For this reason, most short-distance carpool operators are looking for income from business-to-business services (B2B), local authorities or firms.

Firms have an interest in carpooling services being offered at a lower cost to less dense areas or to their employees. In Seine-et-Marne department, the number of places per day proposed by iDVROOM on short-distance rides is the equivalent of running a hundred busses. When a firm reduces the number of parking places or sets up operations in an outlying zone poorly served by public transit, its stake in carpooling rises. In this case, services have to be pooled in a network in order to benefit from the total mass of targeted users. For example, the iDVROOM app can be used for employees to carpool if their firm has opened a "community" on the Copilot (the website for carpooling in Luxembourg operated by iDVROOM Business).

The equation for a successful business model will evolve as advantages come into play. For example, if those who carpool are granted preferential access to highways, their perception of a trip's value or of the action of bringing people into contact will change. Users might then be willing to pay more per trip (under condition that this advantage be an incentive for those who have access and a disincentive for those who do not). After all, carpooling initially became popular for long-distance trips. This is not surprising since, for such trips, tolls often have to be paid on controlled access highways. Furthermore, long-distance public transportation is less subsidized than public transit. To add value to this business mode, efforts have been made to offer services related to short trips (for example, using the trip to make deliveries), but they have not yet proven their mettle. The constraints on the business model are the propensity to pay and the value of the perceived advantage (compared with traveling alone).

Bear in mind that carpooling regulations limit the price of a trip to the sharing of costs without profit for passengers and drivers. In addition, they restrict carpooling to trips that the driver would have normally made on his own. Under these conditions, there can, by definition, be no margin on the service of bringing people into contact. For a margin, another source of value has to be found. It might come from controlling the access to highways or lanes, from using the customer database in order to sell other services, or from the income derived from the data on users or on the trips made. Without this added value, the only way to achieve an economic equilibrium is to break free from the regulatory framework and authorize drivers to earn more. However the operators who have proposed this have been called to order.

A step farther: Blockchains for carpooling

Public authorities hold, as pointed out, a major key to developing short-distance carpooling: incentives related to infrastructure access (reserved lanes, tolls, etc.). They do not want to develop their own carpooling services since such services already exist, but they do often want to interconnect operators so as to reach a critical mass sooner.

Blockchains make transactions possible between parties who do not have confidence in each other. A blockchain managed by public transit authorities could allow the passengers of one operator to carpool with the drivers of another operator without disclosing the identities of these parties to competitors. For interconnections between carpoolers, it would be useful for the state or transit authorities to set up a blockchain that opens access to infrastructures, as foreseen in the Covoiturage Express program in Lyons.

References

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