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ARCTIC MOBILITY VERSUS POLAR TRANSPORTATION: HOW FAR IS THE FAR NORTH AND FOR WHOM?

Introduction

Transport constitutes one of the most concrete dimensions of mobility. Decision making which aims to develop safer, more efficient, comfortable and sustainable transport systems remains a challenge for planning. The integration of transport networks at different scales and the resolution of conflicts between users or stakeholders are parts of the day-to-day puzzles which transport planners face. This puzzle may appear even more complex in an unusual area like the Arctic. Remote, cold, expensive, environmentally sensitive and characterised by an unusual network of governance dealing with native rights and foremost international issues, the Far North certainly remains an unusual region for transportation specialists.

The present paper intends to examine how transportation in the Far North has been treated by the general literature including scientific reports, media and political tools and how the perception of the polar/arctic world has made transportation issues in the Far North considered specific. The paper argues that despite important focus and coverage of role of transportation in the international dimension of the Arctic, the importance of unequal and conflicting access to transportation in the Far North by different actors and, especially from the perspective of local communities, remains a geopolitical issue that impacts on the political agenda of national and international stakeholders.

Following this statement, the paper wishes to demonstrate how transport issues are linked more deeply to the general question of mobility and the question of political control of mobility. Thanks to the theoretical insights developed by structural geography – of which we will briefly summarise the key premises – the analysis will enlighten the reader as to how dissimilar geographical and structural abstract positions affect the trajectories of actors enjoying differing degrees

of political control of their mobility and to what extent these trajectories impact upon the transportation systems in the Arctic region. Therefore, the paper will try to illustrate swiftly and intuitively the assumptions of structural geography in the fields of transport and in the Arctic regions.

In the final section, the paper would like to pinpoint a few major key elements that may help to deepen the previous approach and better understand how various actors at different levels facing differing needs negotiate, dispute and cooperate in the field of transportation. Therefore, we argue that the Arctic region constitutes not only an uncommon area, but also a laboratory for transport diplomacy.

Moving to, from and within the Far North

Far-North Transportation: Global Perspective vs. Local Visions

As the ultimate region of conquest, the Arctic appears sometimes (wrongly or rightly) as a paradoxical space of tranquillity and turmoil. The history of this conquest is intimately connected to transport, to the long and risky trips to reach the pole and set up in the most remote areas. Tribes from Asia crossing the Bering Strait, the vessels of intrepid explorers trapped in ice, ice road truckers blasting through the polar night are among the general narratives and personal stories expressing mobility challenges about the Circum-Arctic.

Symbolically, the Arctic remains an area which seems out of the ordinary: inaccessible, hostile, exotic and spectacular. As a testimony to the challenge it represents, the race to the North Pole in which many nations were committed more than a century ago, generated considerable interest amongst the general public as well as financial support from the major newspapers and influential politicians of the time, culminating in nationalist rivalries[1]. Conversely, albeit risky, weren't the displacements in the northern polar region, part of the vagaries of the day-to-day life of the local people since generations[2]? In recent decades, the highlight of the large economic potential of the Far North, its strategic interest for questions related to international security and the attention brought to the environmental vulnerability of the Arctic, which has been amplified by the escalation of concerns over climate change, have helped to perpetuate the particularity of the Arctic.

This popularity is continuing to show up in an increased number of scientific publications as well as in the substantial circulation of popular books in the public media. Non-arctic countries and political entities have begun to show an

[1] E-A. Drivenes, H. D. Jølle, *Into the ice: The History of Norway and the Polar Regions*, Oslo 2006, pp. 105–117; R. Labévière, F. Thual, *La bataille du Grand Nord a commencé…*, Paris 2008, pp. 25–26.

[2] The so-called "Friendly Arctic".

interest in the northern polar region. Furthermore, the Europe Union itself has started worrying about "its" northernmost periphery with several publications of reports, white papers, policies and involvement in scientific programs[3].

Within the whole literature about polar geopolitics, the importance of transport as a key issue for the development of the Arctic region is constantly mentioned. One may observe that the general treatment of Arctic transport is most often related to three restricted, however weighty, issues. These issues concern:

1. The security and the militarisation (or demilitarisation) of the Arctic; the defence of sovereignty and national interests.
2. The development of access to natural resources and the rich economic potential (mining, fisheries, energy, tourism) of the circumpolar region.
3. Climate change and its impact on the opening of Arctic waters to navigation or international trade, environmental protection and the decontamination of infected arctic areas.

Although these issues remain central, the actual treatment of transport challenges in the Arctic seems, time and time again, to mask one major aspect: that of transport itself, i.e. the mobility of people and goods "from, via and to" the northernmost communities. If this concrete concern is not at first glance specific to the Arctic, the example of issues raised at the local level by Far North residents has been proven to face specific challenges, obviously different from those in "southern" areas.

However, it is unlikely to be mistaken in asserting that as regards the geopolitical dimension of transport in the Arctic, dramatic and global issues have been more prompt to grab the public's attention in recent decades than local challenges, often leaving transport problems which affect local communities. Thus, the

[3] About EU's recent initiatives on Arctic: *European Parliament, Resolution of 9 October 2008 on Arctic governance*, http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P6-TA–2008-0474&language=EN; *Commission of the European Communities, The European Union and the Arctic Region. Communication from the Commission to the European Parliament and the Council. Brussels, 20.11.2008. COM (2008) 763*, http://eeas.europa.eu/arctic_region/docs/com_08_763_en.pdf; *Council of the European Union, Council Conclusions on Arctic Issues. 2985th Foreign Affairs Council meeting Brussels, 8 December 2009*, http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/EN/foraff/111814.pdf. On EU Maritime Policy: *European Commission, Martime Policy*, http://ec.europa.eu/maritimeaffairs/subpage_mpa_en.html; About climate change: *EU Consilium, Recommendations of the High Representative on follow-up to the High Representative and Commission report on Climate Change and International Security, December 2008*, http://www.consilium.europa.eu/uedocs/cmsdata/docs/pressdata /en/reports/104895.pdf; About European research on Arctic climate change: European Commission, European Research Tackles Arctic Climate Change, http://ec.europa.eu/research/environment/newsanddoc/article_2993_en.htm; DAMOCLES, http://ec.europa.eu/research/research-for-europe/environment-damocles_en.html; *IPY-CARE*, http://www.polarfoundation.org/projects/project_detail/ipy-care_climate_of_the_arctic_and_its_role_for_europe/; *Svalbard Integrated Arctic Earth Observing System (SIOS)*, http://www.unis.no/20_RESEARCH/2080_SIAEOS/default.htm (dostęp: 28.03.2011).

public has benefited in recent years from generous press coverage concerning the Russian operation that resulted in the flag-planting on the seabed of Arctic waters and an abundant literature on rivalries for the control of Arctic sea passages[4]. However, interest in issues such as the safety of small boats in local communities, the expenditure of perishable food attributable to transportation costs, difficulties relating to the disposal of industrial and domestic waste and the impact of the Northwest Passage development on local communities appears to be far more discreet to the hoi polloi[5].

On the other hand, it would be mendacious to affirm that local issues are nowadays utterly unfamiliar, at least to government officers and northern transport planners. Far-North local mobility issues are nowadays better known that they used to be, thanks to the implementation of northern regional transportation plans supported by comprehensive infrastructures inventories and diagnoses. The carrying out of prefeasibility and impact studies for transport projects, the elaboration of national northern strategies partly taking into account community visions from public consultations, as well as Arctic trans-border cooperation outcomes have been helpful in pinpointing Far-North specificities. They have identified uncommon characteristics of polar transportation and therefore provided the rhetorical guideline, not to say the main leitmotivs, about the specific needs of Northerners. Further academic concern to deepen well-being issues in the remotes areas have helped to elaborate a more concrete portrait of the mobility (and immobility) needs of the local population. However, local transport issues haven't seemed to find a place in the general analysis of the geopolitics of Arctic transport. Is there an unbridgeable gap between day-to-day transportation problems treated by policy-makers or government officers and the paramount issues threatened by geopoliticians and Arctic political specialists?

Isn't possible to question the weight that local issues actually have on the national and international political scene? Does the daily mobility of northern users influence the geopolitics of the Far North? How do services and transport networks aiming to answer basic local circumpolar needs impact the dynamics of global mobility in the Far North and vice versa? How influential are local actors? This specific issue of levels of intervention and analysis is a classical problem in the field of geography and more specifically in the field of transport

[4] M. Byers, *Who Owns the Arctic: Understand Sovereignty Disputes in the North*, Vancouver 2009, pp. 88–89; R. Labévière, F. Thual, *La bataille du Grand Nord a commencé…*, pp. 63–65; L. Carter, *Arctic Neighbours Draw up Battle Lines*, http://news.bbc.co.uk/2/hi/americas/6941569.stm (28.03.2011); The Barents Observer, *Russia's Mission to Claim Arctic Sea Bed*, http://www.barentsobserver.com/russias-mission-to-claim-arctic-sea-bed.526282–16149.html (28.03.2011).

[5] On climate change, geopolitics and Aboriginal communities, Cf.: S. Pelletier, C. Desbiens, *Changements climatiques et communautés inuit*, in: *Passages et mers arctiques*, eds. F. Lasserre, Québec 2010, pp. 185–222; S. Arnold, *Construire la nordicité autochtone: le «nouveau partenariat» et le projet nordique du Canada*, in: *ibidem*, pp. 119–140.

geography. In land use planning, this problem concerns the so-called "integration of network" at the vertical level. However, it could be said that both global and alleged day-to-day local polar transportation issues start from the same general "particularity" of the Far North. This context provides the key elements for both academic and public policy analysis.

Far-North characteristics, Regional speech-making and transport connections

As part of the Far North, the Arctic region usually fits the characteristics proposed by the Northern Research Forum (NRF) to describe the conjugated specificities of high latitudes. These characteristics constitute a good summary of what could be found in the general literature about the subject. These characteristics include:

– economies based upon the extraction of natural resources;
– lack of internal capital resources;
– limited infrastructural development;
– harsh climates and vulnerable ecosystems diverse;
– relatively strong indigenous cultures and sparse populations[6].

Another characteristic that is worth mentioning here is that apart from Iceland, all Arctic countries have their centres of major political decision-making in the "far" South, many kilometres away from the Arctic circle and the land of the "real" Northerners[7].

One more aspect of the Far North concerns the political system of governance inherited by both northernmost regions and, in general, the Arctic countries. Partly based on the previous mentioned characteristics and structuring circumstances, the Arctic comprises nowadays a governance-network unlike those in other southern area of concerned countries making decision-making more complex. The occurrence of northern treaties between aboriginal peoples and states, the emergence of northern forums and arctic organisations, the accelerated enhancement of circumpolar cooperation, more especially after the 90s, has led to the development of an intricate governance-network within and among Arctic countries at all local, regional, national, pan-regional, trans-national and international levels[8].

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[6] *Northern Forum*, http://www.northernforum.org/servlet/content/about_the_northern_forum.html (28.03.2011).

[7] O. R. Young, N. Einarsson, *Introduction: Arctic Human Development Report*, Akureyri 2004, p. 15.

[8] O. R. Young, *Arctic Governance: Preparing for the Next Phase. Background paper prepared for the Fifth Conference of Parliamentarians of the Arctic Region, Paper presented at the Arctic Parliamentary Conference*, Tromsø 11–13 August 2002; L. Heininen, *Circumpolar International Relations and Geopolitics*, in: *Arctic Human Development Report*, Akureyri 2004, pp. 207–225;

These specificities nowadays feed part of the rhetoric of northern regions which is handled by local actors to advocate the necessity of adapted transportation intervention measures in northern areas, but also by national governments to justify the avoidance of wall-to-wall solutions in the North and the relevance of Northern policies, Arctic strategies and intervention programs in remote areas.

As a consequence of this specific context, the Far North has had a considerable impact on both day-to-day life and public policies. In terms of the mobility of people and goods, one may observe that northern specificities have set hurdles for transport planners, policy makers and other stakeholders involved in transport issues in many ways.

– At the technical level, transportation engineering and logistics must constantly innovate and cope with the unusual reality in order to facilitate the mobility of people and goods both between the Arctic region and the rest of the continent as well as between northern communities themselves. Technical challenges include handling remoteness, cold, environmental fragility as well as omnipresence of wildlife and permafrost issues. As an example of the technical complexity, it is worth mentioning the case of infrastructure maintenance in remote villages. In the Nunavik region for instance (in the North of Québec province) where the fourteen Inuit villages are not linked by road to the south of the province and where navigation is possible for only a few months a year, the rotation between villages of equipment such as crushers must be planned years in advance by taking into account works on infrastructure to be done (on maritime, roads and landing strips) and the anticipation of the need for maintenance, depending on the different uses of infrastructures. Such equipment must travel by boat from one village to another during the navigation season[9]. The advent of one major problem requiring sudden major maintenance or refection in one village or the delay in the schedule of work in one project may soon turn into a major headache, especially if multiple partners (different layers of government) are financially involved in the project or if the necessary works must be done for safety reasons. As another example, the unexpected appearance of boulders in a river that gives access to a village may threaten the delivery of petroleum products in the community because of the risks involved. This situation is especially tragic in northern remote villages where the community cannot afford to wait for the next delivery which will take place in several months.
– At the economic level, the Arctic may hold enormous potential in the energy, forest, mining, fishery and tourism sectors. These activities may themselves drain other development in other sectors, especially in construction, services

N. Wegge, *The Political Order in the Arctic: Power Structures, Regimes and Influence*, "Polar Record", Cambridge 2010, pp 1–12.

[9] It is not relevant or economically rational to have such equipment in every village.

and the transport industry itself. The enthusiasm, however, also leaves room for large uncertainties in long-term benefits, the capability to exploit new lodes, impediments due to the development of international law, operating costs, environmental risks and the possibility of piracy. Alongside the market economy, Northern regions must also contend with the importance of the subsistence economy[10]. This aspect, which also comprises the sharing of common pool resources, is certainly less significant in the southern part of the northern hemisphere (the South of North). It has several consequences for land management, negotiations between the groups involved in regional development and even on the sustainability of wildlife[11]. Issues linked to the subsistence economy still figure at the heart of claims of locals, more specifically indigenous peoples who encompass, in some cases, the majority of the regional population. The development of local economies and the structure of governance have given birth to several specific economic associations linked to traditional activities, as well as to co-operative economic systems, small companies serving local needs or monopolies due to the limited market of protective measures for indigenous business. This situation causes difficulties in the negotiation of new projects or the introduction of new players as the need to find the best compromise must take into consideration the lifestyle of northern populations, the protection of areas for traditional activities, treaties, the limits of the market economy and competition.

– At the political level, as already mentioned, the signature of numerous treaties at the international and national level, the emergence of specific organisations in the North, the improvement of indigenous autonomy in several spheres of activities and development of Arctic cooperation has resulted in a complex system of governance whose architecture influences decision-making, but also the implementation of projects. The planning of cross-border projects in the Barents Sea region must, for instance, cope with many politico-administrative asymmetries between Sweden and Finland (members of the European Union), Norway and Russia, the first three countries also being members of the Nordic Council. The dissimilar evolution of Aboriginal governance between the three countries, as for Sámi, the participation of subnational authorities and a Pan-Arctic agenda adds even more to the complexity. It is in this context that the Barents Euro-Arctic Council (BEAC) plays a coordination role including for targeted projects in the Barents Euro-Arctic Pan-European Transport Area (BEATA)[12]. Arctic governance(s) impacts upon

[10] Cf.: *Arctic Human Development Report*, especially G. Duhaime, chap. 4: "Economic Systems", pp. 69–84; R. A. Caulfield, Chap. 7: "Resource Governance", pp. 121–138; J.-L. L. Jernsletten, K. Klokov, *Sustainable Reindeer Husbandry*, Tromsø 2002.

[11] *Ibidem*.

[12] *Barents Euro-Arctic Pan-European Transport Area (BEATA)*, http://www.beac.st/?DeptID=8573 (28.03.2011).

transportation decision making in many ways that diverge from other regions of the countries concerned due to specific environmental regimes; difference of languages and presence of different cultures; original consultation process and critical path for decision making, standards of project achievements. Governance building in the Far North area may have an impact on the costs of transportation policy implementation and delays in carrying out works, but also positive reconciliation between the parties.

Far North transportation and local communities: A few illustrations

Unlike the situation in their southern counterparts, the national governmental authorities of arctic countries have to deal with unusual transport concerns from local Far-Northerners. Some transportation issues at the local level deserve to be mentioned here to illustrate the particular concerns of northern people regarding transportation issues. These issues include:

– Access to trap lines and hunting areas in order to facilitate subsistence activities by local people. This is because an important part of the aboriginal nutritional regime comes from traditional activities. It has been mentioned that subsistence activities for some aboriginal peoples are not only the end result of the traditions, but also the consequence of economical rationality the cost of many products remains expensive in the Far North, notably due to the cost of transportation and logistics[13].
– Concomitantly, small craft safety constitutes for many aboriginal people an imperative concern as it allows them to secure day-to-day life activities (fishing, hunting, access to living areas, etc.). Improvement of rescue services cooperation and the availability of relevant safety instruments, as well as maritime infrastructure, have been raised as legitimate requests by Northerners. An agreement between the government of Canada and the provincial government of Quebec in the early 2000s provided an opportunity to ensure the construction of 14 maritime infrastructures in Nunavik, which were partly justified by safety motivations[14].
– Adapted snowmobile networks and their regulation may appear as another issue particularly linked with Northern realities. If, in many cases, snowmobiles could be associated with leisure activities, this means of transport has another significance for Far-Northerners using it in everyday life while going to work, school, for hunting, conveying merchandise and visiting neighbours. Regulations regarding driving license requirements, unfair taxation, use and practice of ORVs or network development for reasons other than tourism projects may

[13] N. Bernard, *Nunavik Comparative Price Index*, Québec 2006, p.17.

[14] Québec Government, Makivik Corporation and Kativik Regional Administration, *Entente de partenariat sur le développement économique et communautaire au Nunavik*, p. 10, http://www.saa.gouv.qc.ca/relations_autochtones/ententes/inuits/20020409.pdf (28.03.2011).

involve a discrepancy of views between northern locals advocating adapted measures and southern policymakers defending pan-regional standards.

– Mobile health care and evacuation also deserve to be pinpointed as a specific concern in the Far North as many villages are spread out from each other and not all of them may enjoy equal access to health services. This case is particularly obvious in the case of emergencies where people have to be evacuated by plane to the hospital assigned as the regional one or even, in some cases, far south where major medical services can be provided. This situation has led to some baroque circumstances, notably in Canada where Inuit or Cree elderly people and young children, who do not speak the main languages (French nor English), have to be evacuated south to far major central areas, but cannot be accompanied in the plane by relatives (notably for safety reasons).
– The risky impact of new transport connections in terms of access to drugs, alcohol, gambling and crime in Far North communities. Even if the implementation of a new access road or infrastructure is usually perceived as an improvement of access for remote localities, this situation may also provoke major discussions inside a community and among stakeholders regarding the negative externalities of such projects. Many northern villages have, for instance, an alcohol policies based on interdiction or strong restriction in addition to committed initiatives to prevent crime and drugs. This situation is even more relevant in Arctic communities where young people (here people under 25 years) account sometimes for more than 50% of the population. Not only must new infrastructure projects be conducted in a fragile environment and with expensive implementation costs, they also have to take into account some social issues addressed as major concerns by northern communities.
– Limiting access in some areas to local people. Even if some jurisdictions, northern local communities and especially the Aboriginals have inherited specific exclusive or semi-exclusive land rights, Northerners are still confronted by land use conflicts with external stakeholders. Among many examples, one may mention the use of northern lakes by tourist seaplanes which land in some of them, without considering that these lakes constitute a source of water for the local population and fauna. Local grievances related to limiting some land, water and even air access to non-residents is a politically delicate issues requiring complex arbitration among the stakeholders involved. This includes issues concerning the impact of military transportation and exercises on local northern populations and fauna, the protection of trapline areas, mining prospection activities, etc. As a matter of fact, the absence of transportation infrastructure doesn't mean the absence of mobility or the evidence of the lack of land use by local people.
– East-West connections. If many services and infrastructure have been provided to facilitate the movement of people and goods between the South and

the North, especially those linking the major centres and capitals to the Northern area, many local stakeholders nowadays defend the improvement of infrastructures and services in order to ensure the efficient and safe transport East-West bounds. Communities which have historical relations have been separated, sometimes following political events or national decisions. The creation and consolidation of national impervious borders has even resulted in the separation of communities, notably between Alaska and Russia or in Sápmi between Norway, Sweden, Finland and the Kola Peninsula in Russia. Regional transport planning exercises, the new context of Arctic cooperation and regional building has helped put back on the agenda the issue of connections between northern communities. Requests and concerns may include ORV links between remote northern villages; the adaptation of rail infrastructure and norms between Russia and its Finno-Scandinavians partners; flight connections between Norden communities. In some remote localities, people prefer to take shortcuts using resource access roads – which are non-public roads and considered less well maintained or potentially more risky – than using the longer public and maintained road to go back to their hometown after travelling within the region. This is the case between Matagami and Lebel-sur-Quévillon, two close communities in the James Bay Area and local partners in many projects, where citizens and drivers preferred to use the non-compliant forest road (120 km) instead of taking the public road which involved driving 360 km and increases the distance by more than 200 kilometres[15].

Many other issues could be mentioned here and would deserve further explanation. We think here, for instance, of the norms regarding the allowed driving hours for truckers which appear to be difficult to apply on long northern road trip; the impact of logistics and extended travel on food safety; the presence of animals and humans (notably children) on northern community landing strips; considerations about the empirical evidence (or not) of the positive impact of asphalting gravel roads in remote communities for "health reasons" (dust reduction) despite the importance of the implementation/maintenance costs; the training of skilled workers in remote areas; transport safety awareness campaigns using local and native languages, etc. The previous examples reported here mainly intend to illustrate the originality of the transportation issues in the Far North. They highlight three relevant aspects regarding the geopolitics of transport in the Arctic region.

1. The physical mobility of people and goods in the Arctic regions is structured by complex systems of infrastructure, services and public policies. These systems are supported by a specific rhetoric (we are not like others, our

[15] Québec Government, Transports Québec, *Transportation Plan of Nord-du-Québec: Analysis*, 2005, p. 26.

transportation issues are different, we have special needs, interventions and decision making must be adapted to our realities), supported by differentiated governance systems (indigenous organisations, pan-regional cooperation, etc.) and strengthened by a framework of specific intervention plans and standards (land regimes, Arctic and Northern policies, regional treaties, etc.).

2. Geopolitics does not only concern spectacular, international and conflict issues, but must also take into account the interaction of local actors and consider issues in a perspective integrating different scales and cooperation alliances that facilitate the realisation of joint projects. This is particularly compelling for the north following the "geo-political" context discussed above.
3. Decision making in transportation must deal with several actors at different levels having varying influence, means and interests (needs, concerns). The previous examples concerning the Arctic region have shown an important hiatus between issues that seem to be important on the international level versus those mentioned for local actors.

Regarding the implementation of transportation infrastructure and services in the Far North, one may ask, referring to the classic Lasswell question: "Who gets what, how and when?"[16]. This question barely hides the assumption that actors (local residents, mining companies, government, tourists, etc.) don't have the same capacity access different positions in the Arctic region nor do they have the same ability to promote, defend, and implement projects. Long distances, expensive northern costs, relevant legislation, territory knowledge, political rules of "what could be allowed and what cannot"; which land can be used and for which purpose.

Thus, at first sight and by way of example, the ability of large mining and energy corporations to build impressive infrastructures in remote territories (deep-water ports, airfields, rail infrastructure) and to provide transport services for their own employees seems to contrast with the difficulty of local actors in obtaining medical evacuation services or access to protected grazing areas for the reindeer.

The next part of this paper aims to highlight a profound dimension related to the geopolitics of territorial accessibility. It sees how different actors manage to occupy or control dissimilar territorial positions based on distinct capabilities (symbolic influence, financial, political) and to what extent these capabilities affect 1) the morphogenesis of a specific territory and 2) the further development or localisation of transportation systems. This aspect requires a deepening analysis of the distinction between transport and mobility.

[16] H. D. Lasswell, *Who Gets What, When, How?*, New York 1950, p. 274.

From mobilities to mobility

Far from being a new interest in social sciences, the concept of "mobility" has nevertheless been the focus of extensive work over the last decade. The concept refers to several related themes as movement, migration, displacement, circulation, social level enhancement and transport. Research fields on mobility have given a wide range of studies in social sciences.

In the field of ethnographic and anthropological studies, the difference between "nomads" and "sedentary peoples" is an important conceptual distinction of categorizing the "way of life" associated with the basis of human societies' organisation, distinguishing "[...] people that [travel – L. A.] from place to place to find fresh pasture for its animals and has no permanent home„vs. those "inhabiting the same locality throughout life„[17]. This conceptualisation has given to the possibility to distinguish different kinds of nomadism: Hunter-gatherers, pastoralists, gypsies, etc. This categorisation still remains as a conceptual basis for historians, geographers and anthropologists interested in relations between humans and their ecosystems[18]. By analogy, the concept of social mobility has attracted growing interest since the end of World War II. Analysts of social mobility have concentrated their efforts on showing that mobility can be analysed not only on a horizontal (spatial) perspective, but also at the vertical (social) level. Therefore, many studies have been devoted to the development of individuals and their ability to access new functions to evolve in the social hierarchy, or improve their social conditions, livelihood capital, prestige, influence and power, etc.[19]

Away from focusing solely on the movement of people, the movement of objects is also an important field for the analysis of communities and human activities at different scales. If this notion is essential for economists interested in trading systems, access to resources, value and development of objects, terms of negotiation, regulation and the impact of trade (or, in contrast, to non-trade or non-access to resources), the mobility of objects may also be worthy of interest for anthropologists as it concerns the axiology of individuals and human communities. What does circulate and what does not? What is the value of objects that travel in different times?

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[17] *Oxford Dictionary Online*, http://oxforddictionaries.com/view/entry/m_en_gb0561130#m_en_gb0561130 (28.03.2011).

[18] G. Desmarais, G. Ritchot, *La géographie structurale*, Paris 2000, pp. 23–24.

[19] Among them: S. Ternhstrom, *Poverty and Progress: Social Mobility in a Nineteenth Century City*, Harvard 1964; J. Waldfogel, *Social Mobility, Life Chances, and the Early Years*, CASE paper 88, London 2004; M. Duru-Bellat, A. Kieffe, *Les deux faces – objective/subjective – de la mobilité sociale*, "Sociologie du Travail" 2006, Vol. 48, No. 3, pp. 455–473; L. A. Valle, *Quarante années de mobilité sociale en France*, "Revue française de sociologie" 1999, Vol. 40, No. 1, pp. 5–64; A. Nunn & Alli, *Factors Influencing Social Mobility*: *A Report of Research Carried Out by the Policy Research Institute on Behalf of the Department for Work and Pensions. Research Report no 450*, Leeds 2007.

Similarly, there are other forms of movement affecting human communities[20]. There is, for instance, interest in the topic of the flow of ideas during the movement of intangible objects. What causes an idea, a concept, a science, a methodology, a current of thought to spread? What are the barriers and access points to these ideas? Who has the capacity to transmit them? What is the adaptability of an idea or of certain values within a community[21]? Communication systems certainly play a major role in this type of movement and technology has a significant impact on the flow, speed, quality and quantity of information, ideas flowing. As noticed by Lyons and Loo "[...] the advent of virtual mobility challenges the presumption that accessibility is necessarily correlated with mobility"[22].

Finally, transport itself may be considered to be one of the most concrete dimensions of mobility. There is perhaps nothing like "transportology", but, as an object of study, transportation continues to attract many resources on a concrete sphere of life. It opens up a privileged space for multidisciplinary analysis concerning types and modalities of circulation, access, destination, origins and difficulty to access "resources"[23]. Beyond the purely technical aspects regarding locomotion systems, logistics and transportation management, transport studies also include – among many other things – analysis of human behaviour in transport systems, political efforts to control the flow, security issues, environmental risks and the impact of transportation, comfort while travelling, comparative legislation. Recent research efforts have resulted in the publication of many works linked to the social inequalities regarding transport access depending social, geographical origins and other factors[24].

From Mobility to Transport

The question of transport inequities and mobility asymmetries between different actors has proved to be variously crucial for political decision-making and intricate for social sciences assessments.

Crucial for political decision-making. Needs (desires) can be endless, but resources are more finite. This assumption constitutes one of the rational

[20] Non-anthropic phenomena (as epidemics and contagious diseases) are not considered here.

[21] J. Battilana, M. Anteby, M. Sengul, *The Circulation of Ideas across Academic Communities: When locals re-import exported ideas*, "Organization Studies", Vol. 31, June 2010, pp. 695–713. Cf. also: P. Bourdieux, *Les conditions sociales de la circulation internationale des idées*, "Cahiers d'histoire des littératures romanes", 14e année, 1–2, Augsbourg 1990, pp.1–10.

[22] G. Lyons, B. Loo, *Transport Direction to the Future*, in: *Transport Geography: Mobilities, Flows and Spaces*, eds. R. Knowles J. Shaw, I. Docherty R, Oxford 2008, pp. 215–226.

[23] R. Knowles, J. Shaw, I. Docherty, *Introducing Transport Geographies*, in: *Transport Geography*, pp. 3–9.

[24] J. Hine, *Transport and Social Justice*, in: *Transport Geography*, pp. 49–61.

touchstones of transport planning. Decision-making about the development of infrastructure and transport services usually tries to take into account long-term predictions; profitable and negative outcomes and many criteria (disclosed or undisclosed/considered rational or not), of which the equity issue is one of them. Must all citizens have the same access to the same service? Should all roads be paved? Should citizens from remote regions who do not have access to road systems pay the same tax on fuel? Should we charge the same fines to all drivers at fault regardless of their income? Should we reduce the legal constraints to certain private entrepreneurs when studies show that new infrastructure development has great potential for economic spin-offs? Transport equity questions pose major challenges as many citizen expect to get the equivalent (or adapted) mobility opportunities as others in the same region, country or comparative area. This includes infrastructure, technology, rules, equipment maintenance, frequency of transport service, etc. At a social and political level, this situation is particularly challenging in regard to discrepancies between the arbitrary so-called "main centre" and "peripheral" areas. The sensibility to the concept of sustainable development has added a notch to the complexity of the debate on inequality.

Intricate for social sciences assessments. If transportation can be seen as one of the most material faces of mobility, in the sense that it allows us to see tangible movements of people and goods, is it not in fact bound more deeply to other forms of mobility? Despite the importance of eclectic interests in mobility for political, economic and social scientists, one may observe with confidence that mobility as an object of study remains largely fragmented and relatively ununified, having not established a wider regional ontology, or haven't been subject to a generic episteme. In other words, efforts to conceive something like "mobility studies" still remain relatively weak. Efforts to link social variables about human capital (education level, wage, cultural origins, etc.) with transport are common. They are usually a set of diverse methodology and statistics based on human activities to understand origins/destinations, transport means preferences; time spent in transportations or to evaluate future needs. However, the general impact of "mobility capital" to found any kind of transport forecasting or explanatory model of physical mobility may always be risky[25].

Speaking about mobility in the Arctic or in the Far North regions, one needs to encompass phenomena as diverse as access to education and health systems in remote communities, the importance of the emigration of young women to the south and its effects on Arctic local communities; the movement of reindeer herders in the *Sápmi*, the policy issues related to the Norwegian visa for Russian citizens from the Murmansk Oblast, the development of the tourism industry

[25] M. Welde, J. Odeck, *Do Planners Get it Right? The Accuracy of Travel Demand Forecasting in Norway*, "EJTIR" 2011, Vol. 11, No. 1, pp. 80–95; C. Charlton, T. Vowles, *Inter-Urban and Regional Transport*, in: *Transport Geography*, pp. 120–136.

according to the supply of maritime transport; the propagation and development of indigenous rights within the circumpolar region. In contrast, despite the differences in object, isn't it legitimate to question the existing interaction between different forms of mobility: spatial, social, human, material and ideal? Isn't it legitimate to question links between different forms of the capital of mobility and geo-social asymmetries?

Does good access to resources give good access to local economic growth? Does good local economic growth give access to better infrastructure? Does better access to good infrastructure facilitate fairer access to goods and give better access to education and health services? Does better access to education and health services impact social mobility? Does social mobility impinge on migration or the propensity to travel?

Welcome North: Increasing, preserving, controlling and restricting access!

Over the centuries people have been displaced within and outside continents, have migrated, have traded with stress levels and various risks. Porous borders have become more rigid with the formation of modern states[26]. Significant events have left their mark on geography making the simplifying of the circulation of people and goods more difficult. As an example, the division of Europe after the Second World War into two political blocks with concrete disincentives and physical barriers, had a strong impact on the limitation of movements as a repercussion and not only on the old continent.

Geographical mobility restrictions nowadays still include passport controls, work visas, residence permits, travel costs, etc. Nevertheless, a larger number of people enjoy the opportunity to travel within and outside the national borders without special difficulties, especially in Europe. Access to imported products is more varied. The education of the majority of the population has created opportunities for travellers. The speed of transportation has been increased through technological developments and has yet not diminished the time that individuals spend today on transportation between their place of residence and other places of business[27].

This pooling of policies, programs and projects affects mobility, but does not obscure the inequities or inequalities that exist between people, groups or indi-

[26] L. Heininen, *Circumpolar International Relations and Geopolitics*, p. 207; I. Angelescu, *On Neo-medievalism, migration and the fuzzy borders of Europe: a critical view of the Schengen Convention*, "Journal of Political Analysis and Theory" 2008, Vol. 3, pp. 45–64.

[27] Cf.: D. Millward, *Time spent in transit has not changed since Roman days*, "The Telegraph" 29 May 2006, http://www.telegraph. co.uk/news/uknews/1519722/Time-spent-in-transit-has-not-changed-since-Roman-days.html (28.03.2011); C. Charlton, T. Vowles, *Inter-Urban and Regional Transport*, pp. 122–123.

viduals. These disparities relate to aspects as varied as physical access to public services (health care, schools, emergency services, etc.) between large, developed agglomerations and remote region; time spend in transport to get to work; possibility to avoid expropriation or relocation; opportunity to participate in land use planning decisions; the availability of safe transport; transport costs and storage of perishable products and its impacts on food-safety; transport proximity and the diversity of options for recreational trips, etc. In some remote communities, even access to the banking system is a problem[28].

From these examples several questions may arise regarding the variable capacity of actors to move or take advantage of transportation infrastructure. The European Union can serve as a good example for this situation as "[a]ccessibility to regions and Member States on the periphery of the continent continues to be of concern to the Commission"[29]. One may ask how the EU and its member states should intervene to promote fairness amongst all in terms of mobility? At which point are inequities are acceptable? How much capital of mobility do the various actors in the European Union have? May we identify this capital depending on the type of stakeholders? How is this capital used? What are the consequences of this use of capital? Then, those questions may be adapted to other contexts of governance and to other regions of the Far North as a periphery.

Without embracing the whole field of these issues surrounding the problem of mobility, the scientific advances of structural geography constitute a relevant start to the fundamental nature of this "capital" including its anthropological, political, economic and physical dimensions and materialisation in space. Among the major fundamental contributions of structural geography, one is to have re-introduced the concept of "mobility" as the critical point of human geography premise; a second contribution is the re-conception of the concepts of nomadism and sedentarism.

Toward a grammar of spatial mobility: a contribution of structural geography

Conceived in the 60s and 70s XXth century through the pioneering works of Gilles Ritchot, structural geography was first developed with the intention to critique the epistemological foundation of classical physical geography (geomor-

[28] Option Consommateur, *L'accès aux services financiers* pour les populations du *Nunavik*, du Nunavut et des Territoires du Nord-Ouest, http://www.option-consommateurs.org/documents/principal/fr/File/rapports/services_financiers/oc_serv_fi_grand_nord_200706.pdf (28.03.2011).

[29] *European Commission DG Energy and Transport, Transport Research Knowledge Centre, Equity and Accessibility*, p. 5, http://www.transport-research.info/Upload/Documents/201008/20100809_172522_24665_TRS-Equity_and_accessibility.pdf; http://www.option-consommateurs.org/documents/principal/fr/File/rapports/services_financiers/oc_serv_fi_grand_nord_200706.pdf (28.03.2011).

phology) before looking at the field of human geography in the 80s[30]. Ritchot developed the theoretical framework of the theory of urban form (*tuf*)[31]. Under the influence and the work of Gaetan Desmarais, the theory deepened the precepts of structural geography using the theoretical advances of two other theories: the Greimas's theory of semiotology and the morphodynamic theory based on the works of René Thom and Jean Petitot[32]. This corpus subsequently opened up the opportunity to a series of important applications of the theory to concrete case studies[33].

The development of *tuf* was initially developed in Quebec City and has mainly been diffused in the francophone world. Its daunting theoretical requirements and its critical position toward the dominant classical current in geography may well have contributed to its limited circulation. Moreover, the diversion of conventional terminology for the purposes of tuf and a major critique of the well-established and founding epistemological, anthropological and economical commonplace of geography has led to a strong negative reaction, if not repulsion, towards Ritchot's work[34].

However, structural geography provides a good starting point and powerful tools to analyse both the phenomena associated with concrete forms of geographical establishment (houses, factories, churches, parks, ports, streets) and understand the principle that brings together these concrete forms to the mobility

[30] G. Ritchot, *Essais de géomorphologie structurale*, Québec 1975; G. Ritchot, G. Mercier, *La géographie structurale: une innovation théorique au coin de la tradition*, "Cahiers de Géographie du Québec" 1992, Vol. 36, No. 98, pp. 167–171; T. Rebours, *Gilles Ritchot: géographe structuraliste*, Paris 2010.

[31] G. Ritchot, C. Feltz, *Forme urbaine et pratiques sociales*, Louvain la Neuve 1985; G. Ritchot, *Études de géographie structurale*, "Les Cahiers du Centre de recherche en aménagement et en développement", cahier spécial, 15, Québec 1991; *idem*, *La modélisation dynamique en Géographie*, "Cahiers de Géographie du Québec", cahier spécial, 42, Québec 1998; *idem*, *Québec, formes d'établissement*, Paris 1999.

[32] G. Desmarais, *La morphogénèse de Paris*, Paris 1995; *idem*, *Dynamique du Sens, autour des thèses sémiotiques de Jean Petitot*, Québec 1998; *idem*, *Pour une géographie humaine structurale*, "Annales de Géographie", Vol. 110, No. 617, pp. 3–21, Québec 2001; G. Desmarais, G. Ritchot, *La géographie structurale*, p. 147.

[33] G. Ritchot, G. Mercier, S. Mascolo, *L'étalement urbain comme phénomène géographique: l'exemple de Québec*, "Cahiers de Géographie du Québec" Vol. 38, No. 105, Québec 1994, pp. 261–283; G. Desmarais, *La morphogénèse de Paris;* I. Marcos, *Le Sens urbain, la morphogénèse et la sémiogénèse de Lisbonne*, PhD Thesis, Aarhus University 1996; T. Rebours, *La théorie du rachat*, Paris 2001; S. Gagnon, *La morphogenèse de Gatineau-Ottawa ou comment se construit l'identité d'une région?*, Gatineau 2003; G. Beaudet, *La structuration de l'espace métropolitain et la production des contraintes environnementales: les exemples de La Prairie et de Beauharnoi*, in: *Les espaces dégradés: contraintes et conquêtes*, eds. D. Saint-Laurent, G. Sénécal, Québec 2000, pp. 147–163; *idem*, *D'un urbanisme d'occupations à un urbanisme de positions: fondements d'une approche critique de l'aménagement métropolitain*, "Urbanité", Vol. 3, No. 4, pp. 28–31; G. Desmarais, G. Ritchot, *La Morphogenèse de Rome, des origines à nos jours*, Paris 2008.

[34] T. Rebours, *Gilles Ritchot: géographe structuraliste*, pp. 1–2, 15.

of actors through a dynamic path linking the anthropological, political, economical, and figurative levels. The present paper does not allow us to provide all the technical and specifics details of the theory. However, it is worth mentioning some of its foremost premises.

1. The geographical area is not a homogeneous, uniform, flat isotropy. The space consists of distinguishable shapes recognizable by humans. Space does not move under "humans", but humans move through/in this heterogeneous space. In this movement, the forms can only be distinguished phenomenologically and invested separately by meanings.
2. Humans are strange animals. Even if they need resources to live and tend to organise their movements and locations following economic logic, this principle is not the only one that influence their mobility. Contrary to what is professed by most spatial theorists, humans do not always go directly to resources, but are also constrained by anthropological events and bans. The occurrence of significant major events, seen as euphoric or dysphoric (death, conflict, etc.) enable the positional investment of values in the space. The subject then operates in a purely "aesthetic" way and is forced to apprehend these values affectively into the forms of a sensitive landscape into a meaningful environment by focusing on salient forms[35]. The emergence of places of significant values set up a dynamic of valorisation with places of importance vs. other places of less importance that create attraction and repulsion. This situation leads to the domains of prohibited vs. authorized; euphoric vs. dysphoric; valued vs. devalued results in a system of qualitative discontinuities.
3. By setting a system of discontinuities in the territory, this dynamic interfere and impacts the mediation of man with nature and affects the trajectories of humans. This rule – the rule of property – establishes a dialectic regarding what is allowed and what is prohibited. This situation is, for instance, particularly apparent in the case of the presence of position when linked to funerary rites. On the one hand, it allows setting up around the location reserved for the sacrificial victim (vacuum) where the funerary rite takes place. On the other hand, it prohibits one to set up within the territory captured by the contact from the salience of the corpse of the victim[36]. As mentioned by Desmarais: "As such, the property appears as a dialectic of authorization and interdiction which anticipates and determine apriori any particular form of

[35] G. Desmarais, *Des prémisses de la théorie de la forme urbaine au parcours morphogénétique de l'établissement humain*, "Cahiers de Géographie du Québec", 36, 98, Québec 1992, pp. 259–262. About the mechanism of victimhood, founding murder and the emergence of vacua (funeral places, cemeteries, memorial sites), cf. also: G. Desmarais, G. Ritchot, *La géographie structurale*, pp. 17–19.

[36] G. Desmarais, *Des prémisses de la théorie*, p. 264.

possession"[37]. As a consequence, the actors have to negotiate between them, the appropriation and the occupation of positions[38].

4. The rule of property and the dynamic of positions introduce a political program which involves the takeover of mobility issues among the subjects[39]. The subjects do not all have the same mobility. Beyond the physical capabilities of the subjects, some of them acquire the political power to determine what could be access and what could not. Dominant subjects can gain access to certain positions in space, controlling these areas, allowing other actors or not to access those positions. Other subjects can only settle in areas authorised by the former. Thus, the structural geography refers to "Nomads" for the "dominant" subjects in control of their mobility and those with the greatest authority to access the space invested by positive value (aesthetic, sacral), but also those who have political control over the mobility others. Concomitantly, the "sedentary" subjects designate those who might have resigned themselves to access spatial positions approved by the former[40]. This situation highlights the existence of an important dimension for the geographical analysis of human settlement: the existence of the political control of mobility by socio-geographical subjects.
5. Ultimately, geographical positions differentiated by co-relative and distinctive positions acquire different economical values which are reflected in the land value hosting various concrete, physical and architectural forms of settlement, depending on their co-location. This localisation of concrete forms must be compensated or made profitable by relevant economical activities. Usually, productive activities are localised in the same areas generated in the mobility process than those that welcomed sedentary subjects while areas attracting and gathering nomads localise more valorised, concrete forms of settlement.

Taking some theoretical shortcuts, it can be said that nomads are historically associated with actors with political and/or symbolic sacred authority and are usually the major landowners. Historically, these are actors who have claimed the most privileged and valued places; they regularly have the political or economical capacity to access the expensive position in space, especially where the rent is high[41]. Monumental and spectacular forms of settlement (castles, cathedral, large protected domains, wealthy neighbourhoods, etc.) are generally localized in the valorised position accessed by the nomads. In contrast, sedentary access to less

[37] *Ibidem*, p. 265.

[38] G. Desmarais, G. Ritchot, *La géographie structurale*, p. 23.

[39] *Ibidem*.

[40] Structural geography makes distinction in fact between the "selective nomads" who may select their position and sedentary and residual nomads, whose mobility and potential occupied positions depend on the former. Instead of "dominant"subject, it is proposed to use the term "endo-regulated" as it will be mentioned below.

[41] T. Rebours, *La théorie du rachat*, p. 258.

valued spaces like working class neighbourhoods, modest countryside farms, production plants, etc. is limited. As often as not, major nomadic landowners of resource-spaces "support" the mobility of the sedentary by funding not only transport and infrastructure, but also workers' housing that they can rent.

The conceptual basis of structural geography has several consequences. Without depreciating the anthropological notion of "way of life", structural geography considers the notions of nomadism/sedentarism from a deep fundamental structural relation between subjects. But, more importantly, it calls into question the traditional dichotomy of "urban/rural" areas respectively associated with the functional dichotomy between 1) high population concentration/technologically and industrially developed vs. 2) the remained spaces on the margins, with low densities supported by economy linked with traditional exploitation of resources of the primary sector. In the structural geographic perspective, the "urban location" is now used for the privileged position of nomadic actors. It opposes the "rural position" by sedentary actors[42]. Consequently, there are always urban areas in the countryside (e.g. rich farmer domains and isolated outfitters) and rural positions in larger cities (e.g. industrial workshops and modest or middle class residency districts)[43]. The urban area doesn't depend arbitrarily anymore on the type of activities or on the number of people. It depends on geographical discontinuities and the further capacity of actors to occupy positions or not, depending their control of mobility. Structural geography is also challenging the disproportionate attention enjoyed by the couple "centre/periphery" advocated by classical geography and most of the dominant radio-centric explanatory models of the territory in which most populated cities figure as "centres " and less populated areas as suburbs and "rural periphery"[44].

Structural geography doesn't deny the existence of "centrality" and "periphery" nor the possibility to pinpoint cultural differences between regions. However, the regional differentiation is first structured by the mobility of actors following their level of political control regarding centres of attraction like certain positive vacua and spaces that are divergent to those poles at their periphery. The trajectories of actors according to their level of mobility is consequently deep-seated. Desmarais and Ritchot write:

> The trajectory that determines a place [lieu] politically as a structural position [position structurale] is then described as "endo-regulated" [endorégulé] if the actor who accesses it, controls its mobility, and "exo-regulated" [exorégulé] if the mobility of the actor is beyond [échappe à] its control. [...] Furthermore, the converging trajectories (constituting

[42] G. Desmarais, G. Ritchot, *La géographie structurale*, pp. 27–28, 61–86.

[43] *Ibidem*, pp. 91–94, 100–101; G. Beaudet, *Domaines "vides" et structuration morphologique de l'agglomération montréalaise*, "Cahiers de géographie du Québec" Vol. 41, No. 112, Québec 1997, pp. 7–29.

[44] G. Desmarais, G. Ritchot, *La géographie structurale*, pp. 61–86.

centralities) are polarising, while the divergent trajectories (constituting peripheries) are diffusing[45].

Following the concept of distinct geo-political mobility described by structural geography, the episteme of space now benefits from a new vision for the organisation of the territory. Subsequent to the premises described above, the two trajectories (polarizing vs. diffusing) and the two types of control of mobility (nomadic vs. sedentary) result in four kinds of geographical occupation (or classes of trajectories). This can be schematised in the following table inspired by the Greimas' semiotic square.

Table 1. Trajectories of actors related to their control of mobility

Control of mobility	Mobility direction	
	polarising	diffusing
Nomadism	congregation (urban)	evasion (dynamic urban)
Sedentarism	concentration (agglomerate rural)	dispersion (deep rural)

The movements are the following:

- Polarizing/nomadic: movements of **congregation** (rassemblement). The emergence of valuable positions attracts "nomads" that can afford the positions (politically and economically). Those poles welcome spectacular concrete forms of establishment (palaces, luxurious houses and districts; cathedrals, etc.). These concrete forms may change depending on periods in history. They, however, take advantage of economic benefits and from production activities (resources exploitation, trade, taxes return) controlled by the nomads which are initially and generally localised in rural area (structural geography meanings).
- Diffusing /sedentary: movement of **dispersion** (dispersion). The monopolization of access to valued positions by nomads limits the access to sedentary actors not having comparable control of their mobility and oblige them to get around and set-up in "accessible" and "authorised" positions.
- Polarizing/sedentary: movement of **concentration** (concentration). Sedentary actors gather around accessible positions. These positions may be partly politically planned, developed and funded by nomadic actors who allow sedentary actors to settle in these areas. Political mobilisation and the funding

[45] *Ibidem*, p. 25. Personal translation. Here "constituting centralities" and constituting peripheries is used to translate literally and unwieldy: "constitutives de centralité" and "constitutives de périphérie".

of productive forces allow nomads to even moved sedentary actors (workers, soldiers, low-class farmers) in certain areas by assuming concrete forms of settlement and even infrastructure and means of transport.

– Diffusing/nomadic: movement of **evasion** (évasion). Actors having or acceding to their control of mobility, escape and reach new valuable positions that cannot be accessed by sedentary peoples or eventually blocked to them. These places welcome some spectacular forms of land use (major national parks, luxurious resort areas).

Desmarais notes:

> These trajectories are fundamentally conflictual. In principle, each trajectory of mobility tends to invade the whole of geographical space, so that the limitation of one results in a conflict with others. The dynamic conflicts between trajectories generate the deployment of spacio-temporal qualitative discontinuities that categorize the empty geographic space areas whose identity is purely urban or rural positional[46].

One of the tasks undertaken by structuralist geographers consists in the reconstruction of long-term human settlement following the trajectories of actors according to their respective control of mobility and trajectories. Using Greimas' actanctial model, it is then possible to map in time the change in the territory where one may observe the morphogenesis of the territory and establish a "morphogenetic path of human settlement". This constitutes another methodological outcome of structural geography that is worth of mentioning[47]. This "play" between mobility direction and the mobility of control is not static, but is developed over time. This morphogenesis can take place over very long terms[48]. The following diagram of the morphogenesis of the territory has been proposed by Desmarais and echoed later by Gagnon. They identify three layers of spatiality (I, II, III) to which the author of this paper has added a fourth layer (IV)[49].

Many aspects of structural geography deserve further clarification here. Its development has given birth to important works and very complex and fundamental insights. Unfortunately, the shortness of this paper doesn't allow a deeper analysis[50].

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[46] G. Desmarais, *Des prémisses de la théorie*, p. 256, personal translation.

[47] G. Desmarais, G. Ritchot, *La géographie structurale*, pp. 61–86.

[48] *Ibidem*, pp. 72–77, 107–129; G. Desmarais, *Des prémisses de la théorie*, pp. 269–270; T. Rebours, *Gilles Ritchot: géographe structuraliste*, p. 15.

[49] Here we differentiate this fourth from the economic layer in order to highlight the physical and concrete forms of settlement. Previously Desmarais refers to "four structural levels hierarchised by relations of presupposition in which it is mentioned the 'figurative level"; G. Desmarais, *Des prémisses de la théorie*, p. 259.

[50] Many publications from the structural geographers of Québec ought to have a translation in English with an important effort to fix the technical terminology in a relevant way. Among the most important works and a good theoretical start for reading, we especially think here of the groundbreaking paper of G. Desmarais, *Des prémisses de la théorie de la forme urbaine au*

Table 2. Dynamics of Morphogenesis of Human Settlement

Layer		Aspects	Dynamic
IV.	prominent (or figurative) layer	architecture/ technologies/ construction /engineering	dynamic of edification
III.	surface layer	economic	dynamic of occupation
II.	intermediate layer	geopolitics	dynamic of appropriation
I.	deep layer	anthropological	dynamic of symbolic investment

It is not possible to undertake here a substantial analysis of the morphogenesis of transportation infrastructure and services in the Far North. Nevertheless, the following part of this paper intends to raise certain assumptions and explain through some examples the relationship between the development of practical forms of transportation and the various forms of mobility control enjoyed variably by some actors in the Far North.

Mobility of actors and transportation systems in the Far North

Subsequent to previous remarks regarding the control of the mobility of actors and the differential relations of localisation due to distinct positional values in the geographical space, some outcomes on transportation systems may be suggested. Three statements which are co-related can be put forward.

1. As a first statement, it could be mentioned that transport infrastructure and systems should not only be regarded in their functional perspective, but in their structural dimension fundamentally linked to the dynamic of human settlement. The infrastructures of transport are a concrete form of settlement and are localised in regards to the dynamic of positional values and their appropriation by different actors.
2. As a second statement, it could be asserted that transportation systems depend on the mobility control of their sponsors. This sponsoring is therefore not only financial, but political. Actors having the control of mobility may fix the conditions under which transport systems (and general spaces linked to physical mobility of people and goods) can be developed, maintain, dismantled or even often abandoned.
3. The settlement of concrete form and activities associated with transportation systems are part of a dynamic process and take place in the morphogenesis of human settlement, impacting yet again on the trajectories of actors.

parcours morphogénétique de l'Établissement humain (1992) and the indispensable monograph of G. Desmarais and G. Ritchot, *La géographie structurale* (2000) which constitutes a summary of structural geography (however quite difficult).

However partially trivial these statements seem, they tend to enlighten the fact that variable positions consequent to the variable trajectories of actors will result and materialise in different forms of transport systems. In general, as noted by Gerard Beaudet: "[the] equipment of transport and production, old residential fabric of the industrial period and modest suburbs are more likely to border brownfield while more comfortable habitats, old or modern, generally accompany squares, green spaces public and private"[51]. The construction of large urban boulevards are less likely to be found near the wealthy neighbourhoods where property values and costs of expropriation are important than in older industrial neighbourhoods and wasteground.

The major construction of infrastructure accompanying the colonization of remote boreal regions in Canada, Alaska and Scandinavia has been financed and politically endorsed by actors assuming such a colonization of the North. The location of mines, lands for agricultural production or forestry and trading posts was generally assumed by the "crown" or large corporations of the concerned countries. These initiatives have historically resulted, and still result, in a series of conflicts in land use with actors already present in the terra firma, but not enjoying the same capital mobility.

This should not, in any case, discredit the vernacular knowledge of local communities or more particularly the traditional knowledge of indigenous peoples in general who have a deep comprehension of the territory where they live, thanks to their tangible occupation and intensive movement within their homeland. Nonetheless, it transpires that this residual and traditional nomadic mobility is subject to the constraints imposed by endo-regulated selective nomads and has to be "negotiated" with the latter[52].

Referring to Table 1 and the four trajectories of actors resulting in the dynamic occupation of the territory, it is possible to illustrate how concrete forms of transportation and transport systems are related to the differential mobility of actors.

It is important to remember that the positional relations can be deployed on a large scale. The appropriation of highly valued positions around prestigious sites, heritage neighbourhoods and monumental locations in the capitals of southern Denmark, Finland, Norway, Sweden may lead to the congregation of selective nomads who will condition the trajectory of dispersion of sedentaries in relative peripheral positions. The concentration of the population and human institutions/infrastructure around the new nuclei of human settlements may occur within metropolitan areas (in a modest immediate area, in the remote countryside or even in the hyper-periphery of the Far North. These spaces may be supported by political and economic nomads who eventually leave the space of concentrations

[51] G. Beaudet, *Domaines "vides" et structuration morphologique de l'agglomération montréalaise*, p. 13.

[52] G. Demarais, G. Ritchot, *La géographie structurale*, p. 72.

to re-localise in new positions of evasion. Transport systems as concrete form of settlement (figurative layer) in the North must therefore not be considered from their regional perspective, but from the result of the morphodynamic of positions and trajectories.

In the movement of **congregation**, valuable positions attract subjects and come under the control of selective nomads that can afford these positions politically and economically. Those positions are generally not characterised by imposing the infrastructure of transport, but are generally welcomed as a prestigious form of concrete settlement as for spectacular institutional domains, sumptuous villas, cathedral and historic cult places and sophisticated metropolitan squares. Such congregation is unapparent in the Far North. In the context of structural geography, such a position conditions, however, the movement of actors. By welcoming selective nomads, important institutions and sumptuous forms, the position make access more difficult to sedentary subjects who follow therefore a trajectory of dispersion. As an example, Xstrada which operates the Raglan mine, located in Ungava Bay (Nunavik) in the northern part of Quebec (Canada) provides air transport to its employees living in the south. Work weeks are organized to allow the alternation of work teams. Xstrada owns an airstrip (Donaldson) near its mine site and a deepwater port. The company, which has several mining activities around the world, has its main service office in London, more precisely in the emblematic Piccadilly Circus district.

In the movement of **dispersion**, sedentary actors not having comparable control of mobility to that of nomads have to move to available, accessible and authorised positions. The appropriation of a space by selective nomads or the establishment of new rules or barriers may have major repercussions for the presence of sedentary actors (including residual nomads). In the movement of **concentration**, sedentary actors gather around accessible positions. These positions may be partly politically planned, developed, funded and promised by nomadic actors who allow sedentary actors to settle in these areas. Political mobilisation and funding allow nomads to even moved sedentary actors (workers, soldiers, low-class farmers) in certain areas by assuming concrete forms of settlement and even infrastructure and means of transport. Railways and roads financed by the states contribute to the transportation of people to their place of work and life. Sedentary people may access more modest districts in major agglomerations (concentration) as well as traditional rustic spaces reserved for farming (dispersion). With years, access to credit gives opportunity to several sedentary subjects from the middle working class to localise themselves in more wealthy suburbs (**concentration – pseudo-evasion**) and benefit from space analogous to those of selective nomads, although under the constraints of differential valued positions. Airports and port facilities are usually located in rural areas (in the structural meaning of the term) in positions accessed by sedentary subjects.

In the case of the Barents Euro-Arctic Region (BEAR) notably inhabited by the Sámi, several contemporary examples of the intervention of selective nomads have created movements of dispersion of the local population, followed by movement of concentration in the North can be given, starting with the case of construction of the hydroelectric dam in Alta (Finnmark) despite the significant opposition of the Sámi and environmentalists in 1981[53]. The presence of new corporate wealthy actors as mining and forest corporations, petrol industries and other energy companies have contributed to economic development in the northernmost provinces of Finland, Denmark and Sweden in recent decades by playing a role previously played by States. Able to finance their own infrastructure and mobilise workers, these new nomads, in the structural sense of the term, take part in the actual reality of Arctic geopolitics, a situation that raises new questions about conflicts of land use with local people[54]. In this regard Aune Rummukainen wrote:

> The main threats to the Sámi people in Finland are now increasing mining, logging forest in State-owned areas and diminishing supplies of lichen, reindeers' main natural food. Climate change can make soil more fertile and lichen needs barren soil. Teams of dogs used for tourism purposes can disturb reindeer. When reindeer roam close to roads there is a risk of car accidents[55].

These situations are very much part of the discussions among all local authorities, businesses, state, international and pan-regional forums established in recent years and taking part in the governance problem in the Barents Arctic region. Extreme cases of dispersion or effort to create new positions of weak concentration under political agendas also include the forced relocation of the Inuits of Nunavik by the Canadian government in the 50s[56].

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[53] A. Somby, *The Alta Case in Norway. A Story about how another Hydro-electric Dam Project was Forced Through Norway, prepared for Thematic Review I.2: Dams, Indigenous People and vulnerable ethnic minorities. World Commission on Dams*, Copenhagen 1999; L. P. Dana, *Community-based entrepreneurship in Norway*, "Entrepreneurship and Innovation" 2008, Vol. 2, pp. 77–92.

[54] P. Arbo, V. Didyk (and others), *Socio-economic Consequences of an Extensive Oil and Gas Development in the Barents Sea. A Report Prepared for StatoilHydro by a Group of Researchers from Norwegian College of Fishery Science*, University of Tromsø, Alta 2007; C. Green, *Managing Laponia: A World Heritage as arena for Sami ethno-politics in Sweden*, "Acta universitatis upsaliensis" No. 47, Uppsala University 2009.

[55] A. Rummukainen, *Indigenous Peoples'Right to Land – The Sámi People in Finland and the Veddha People in Sri Lanka as Examples. FIG Congress 2010, Facing the Challenges – Building the Capacity*, Sydney, Australia, 11–16 April 2010, http://www.fig.net/pub/fig2010/papers/ts09j%5Cts09j_rummukainen_3867.pdf (28.03.2011).

[56] R. Dussault, G. Erasmus, *The High Arctic Relocation, A Report on the 1953–55 Relocation*, Toronto 1994. CBC news, Inuit Get Federal Apology for Forced Relocation, http://www.cbc.ca/news/canada/montreal/story/2010/08/18/apology-inuit-relocation.html?ref=rss (28.03.2011).

Another example involving the Sámi is connected with the development of borders between Nordic states and cross-border travel. While the Sámi were able to move with relative freedom in the whole of the Scandinavian peninsula and Komi for centuries, the establishment and confirmation of political borders accompanying the creation of modern states to northern countries contributed to the restriction of the movement of the Sami and, a fortiori, of reindeer herders[57]. From the early XIXth century, national boundaries were closed between Norway and Russia in 1852 and between Finland and Sweden in 1889. The independence of Norway and its separation from the union with Sweden in 1905 is also followed by border measures that will result in limiting access to the Sámi area travelling from Sweden to Norway during the summer grazing season[58]. This has important consequences for the movement of reindeer herders as noted by Lindqvist:

> This boundary closure had grim consequences for the Sámi since traditionally they had been able to migrate across state boundaries. Many Sámi lost their summer pasture rights on the Norwegian Atlantic coast and their pasturage areas became smaller, which led to more permanent settlements[59].

The border tightly established after the Second War between the USSR and its two neighbours to the North-East, Norway and Finland, has isolated the small community of Sámi from the rest of the *Sápmi* for years so that the political, socio-economic rights and recognition of the Sámi in Russia has followed a different path. In spite of important differences between the various communities of Sámi, Nikolova remarked that the Sámi`s territoriality is inconsistent with the "national borders":

> The traditional homeland – Sápmi – even though diffusely defined, does have its borders and is internally separated into areas defined by types of livelihood and language differences. The Sámi language is divided into nine distinct separate languages further subdivided in many local dialects. Due to the geographical distances dialects far from each other could be difficult in communicating with each other. These cultural borders are not static and run across the borders of today's states. Thus, Sámi territoriality is characterized by mobility and diffused boundaries and is essentially incompatible with the territorial organization of the state (a politically integrated entity with a fixed territory and a central authority)[60].

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[57] A. Forrest, *Do Fences Make Good Neibourhood. The Influence of Territoriality in State-Sámi Relations. Master Thesis*, University Of Northern British Columbia 1998.

[58] S. Ekenberg, *Indigenous Peoples and Rights: A Baseline Study of Socio-Economic Effects of Northland Resources or Establishment in Northern Sweden and Finland*, Luleå 2998, p. 14.

[59] J. Lindqvist, *Reindeer Herding: A Traditional Indigenous Livelihood*, "Macquarie Journal of International and Comparative Environmental Law" 2009, Vol. 6, p. 9.

[60] B. V. Nikolova, *Sámi Reindeer Herders – Land and Identity Non-recognition of Indigenous Land Rights – Reasons, Effects and Potential Developments (the Sámi Indigenous People in Sweden). Master thesis*, Lund 2007, p. 7.

Physical establishment and appropriation are not the only political interventions by selective nomads which has an impact on the territorial mobility of actors. Another example that can be given concerns the integration of common rules and standards between member states of the European Union. The entrance of both Finland and Sweden into the EU has altered the usual way of conducting traditional and subsistence activities by the Sámi. These aspects have had an impact on traditional activities and therefore their mobility. Greater market openness has required the Sámi to adapt to face new competition and new obligations concerning employment standards, sanitary norms and economic regulations that unfits Sámi family economy. "European Union legislation is disrupting traditional trade routes while globalisation is altering traditional lifestyles" said Dana & Dana[61]. New sanitary standards also force the Sámi to change their way of killing animals under certain standards designed to adapt to temperatures in southern Europe which take little account of the practicalities of winter in Lapland[62]. Some of these EU adjustments increase the differences with the Sámi of Norway.

> Sámi respondents in Finland indicated that they would like more contact with Sámi people in Norway and Russia, than with other Europeans in the Union. Sámi entrepreneurs in Norway complained that they suffer from the fact that Finland and Sweden are becoming increasingly integrated into the European Union[63].

This last issue about political integration is a good pretext to add a note on general globalization and modernization. Among the forms of integration, technological developments have had, for many analysts, a major impact on the mobility of the Sámi. The advent of snowmobiles, the utilisation of helicopters, GPS location systems and mobile phones has undoubtedly increased physical mobility of the Sámi, but also changed their lifestyle and involved additional costs, including the cost of petrol[64].

Adjustments to new policy frameworks redefine the relationship between actors (individuals, groups, institutions, states, unions, forums and organisations) by formulating the problem associated with the control of the mobility of actors not just in term of physical movement, but also in terms of opportunities to migrate, border-crossing, access to infrastructure and services reducing time travelling, capacity to select areas of establishment. Paradoxically, the control of

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[61] L. P. Dana, T. E. Dana, *How do self-employed Sámi people perceive the impact of the EU and globalisation?*, "International Journal of Business and Globalization" Vol. 1, No. 1, p. 3.

[62] *Ibidem*, p. 13.

[63] *Ibidem*.

[64] J. A. Riseth, A. Valn, *A Perspective on the Sámi-Norwegian Case of Co-management in the Reindeer Industry: Regional Failure and Success at the End of the Old Millennium. Paper presented at the 8th Biennial Conference of the IASCP*, Bloomington, Indiana, USA, May 31–June 04, 2000; National Sami Information Centre, *Sami – an Indigenous People in Sweden*, 2009, p. 20, http://www.samer.se/2137 (28.03.2011). A. Rummukainen, *Indigenous Peoples'Right to Land*, pp. 4–5.

mobility includes the control of immobility. In terms of migration, for example, despite numerous migrations, one may remember that a majority of people do not move. The capacity to defend land use or oppose infrastructure projects is also regulated by territorial positions and the variable control of mobility of actors.

Finally, after the long explanation of the trajectories of dispersion and concentration, a short comment can be added concerning the movement of **evasion** where actors having or acceding to their control of mobility may escape rural positions or former congregation positions that have become too popular and have lost part of their value. They may reach new valuable positions that cannot be accessed by all sedentary people. Nomads can eventually even control them and limit their access. Expensive northern outfitters give a chance, for instance, to nomadic subjects to reach spaces of idealised and unapproachable nature to ordinary mortals, sometimes after the purchase and negotiation with the state. Means of access include exclusive expensive cruises and seaplanes landing in remote Arctic lakes.

Conclusion: a program toward transport diplomacy

In the present paper, I have tried to demonstrate that the systems of transportation in the Far North have to cope with several issues which have received differing degrees of attention from academic works, the popular media and decision makers. If most of these sources seem to reckon that the Far North copes with unusual challenges if compared to other southernmost regions of North America and Europe, the general question related to the link between global issues and local needs further development.

Among the important issues regarding transportation in the Far North, one may address the concerns of unequal and conflicting access to transport by variable actors in the North. Decision making and transport planning to unsure fair transportation service, positive outcomes and the well-being of the northern population as well as the protection of transport users and the defence of national and international interests has become a major challenge.

Following this statement, it was argued that:

1. Even if local issues appear to concern small communities and phenomena on the small scale, those issues cannot be considered only as marginal and minor questions. They find a place in the general reflection of the geopolitics of the circumnordic region as transport systems must be considered from their holistic perspective. Polar states invest a lot of energy and money to answer the needs of local communities. Local development may also have an impact on international positioning. The development of cooperation in the Arctic, best practice guides of transportation planning, indigenous rights, greater sensibility for equity issues, the large circulation Northern policies and domestic political campaign to advocate national investment in remote regions have

forced local actors, states, powerful corporation and international organisations to sit together.

2. The geopolitics of the Arctic must consider transport not only in its functional perspective, but also, and primarily, from it structural dimension, taking into accounts the capitals of the mobility of actors. This relative control of the mobility of actors is itself structured by profound relations between differential valued geographical positions.

This last statement was briefly outlined after referring to the major theoretical inputs of structural geography. The epsiteme put forward by structural geography constitutes a major tool for the better understanding of the links between the symbolic (anthropological) political, economical and figurative dimensions of human geography. It opens up an important field of research, nevertheless intricate, about physical geography, human settlements, semiology and politics. The conception of the "political control of mobility" remains a key element for the better understanding of the morphogenesis of the ecumene.

This paper represents a modest contribution to a better understanding of a few aspects of what we think have not been the objects of extended analysis among the works of structural geography. These topics concern transportation as the main object of morphogenesis analysis and far remote areas. A greater deepening of these subjects in light of the structural geography episteme should include specific territorial analysis in long-term range and further description about transport systems. Another issue concerns the discretion of the structural geography in English literature and the greater diffusion of actual results for additional discussion.

Regarding the geopolitics of transport in the Arctic and remote regions, it is believed that several bridges could be built. One of these bridges concerns the practitioners (decision makers, transport planners, government officers) active in Far North regions and scholars interested in the geopolitics of the Arctic. The former, having a good knowledge of transport local issues and the latter having showed interest for international perspectives. Another bridge concerns the link between polar transport planners and government officers to compare perspective from different circumnordic regions. If scientific forums and transnational political organisations have made international exchanges and discussion on many concrete topics possible, there seems to be few comparative studies or a global portrait of the transport situation in the polar region. For example, a chapter on mobility, immobility and the transport system could be included in a possible re-edition of the important Arctic Human Development Report published for the first time in 2004[65].

Finally, the challenges faced by transportation in the Far North doesn't only concern polar regions. Transport planning obliges decision makers to priorise.

[65] Except for the Barents region.

Transportation systems and likely communications networks are obviously the domain of intervention easily reflecting linkages and interdependencies between different spaces beyond geographical and social divisions. Meanwhile, the Far North constitutes one of the most interesting meeting point to test human interactions. Allanson and Eðvarðsson wrote, while talking about the Vestnorden[66]: "Small nations in the Vestnorden area are stimulating field of scientific study. In such communities, the fabrics of society are visible, and connections and correlations between different factors, can be seen more easily than in larger societies"[67].

We believe that something similar can be said about transport in the Far North. The multicultural dimension, the complex network of governance, the extreme conditions of interventions, the importance of small communities in a large area, the presence of conflicts and cooperation at different scales make the Far North an ideal milieu to understand other (non-arctic) regions and community spaces. In regards our starting point, the unequal and conflicting access to transport in the Far North, the Arctic region offers an amazing laboratory for understanding the mechanisms of negotiation and cooperation between stakeholders in the sector of transport. Such a perspective consequently opens up a space for reflection upon transport diplomacy.

Streszczenie

ARKTYCZNA MOBILNOŚĆ KONTRA POLARNY TRANSPORT: JAK DALEKO JEST DALEKA PÓŁNOC I DLA KOGO?

Artykuł podejmuje zagadnienie transportu na Dalekiej Północy. Mimo że uznaje się wagę transportu w rozwoju oraz geopolityce Arktyki, do tej pory skupiano się raczej na spektakularnych problemach międzynarodowych. Zagadnienia te wiążą się głównie z kwestiami dostępu do zasobów naturalnych, bezpieczeństwem i narodową suwerennością, a także zmianami klimatycznymi. Potrzeby i obawy lokalnych aktorów nie były do tej pory tematem prawdziwej i głębokiej analizy. Artykuł proponuje spojrzenie na różnice i niesprawiedliwości, które istnieją między różnymi aktorami, czerpiącymi z usług i systemu transportu na Północy. Dzięki nowej perspektywie geografii strukturalnej oraz koncepcji „kontroli mobilności", artykuł dąży do pokazania kompleksowości geopolityki transportu na Dalekiej Północy. Tekst dowodzi, że warunki polarne nie są jedynym czynnikiem wyjaśniającym regionalną specyfikę systemu transportu w Arktyce.

[66] Faroe Islands, Greenland and Iceland.

[67] J. G. Allansson, I. R. Eðvarðsson. *Introduction*, in: *Community Viability, Rapid Change and Social Futures*, eds. G. Allansson, I. R. Edvardsson, Akureyri 2000, p. 7.