

INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ENVIRONMENT & GEOGRAPHY



Collective Intelligence and Spatial Mobility in Mechanics and Organics Traffics

Gabriel Kelton

To Link this Article: <http://dx.doi.org/10.46886/IJAREG/v1-i2/1564>

DOI: 10.46886/IJAREG/v1-i2/1564

Received: 20 July 2014, **Revised:** 24 September 2014, **Accepted:** 12 November 2014

Published Online: 23 December 2014

In-Text Citation: (Kelton, 2014)

To Cite this Article: Kelton, G. (2014). Collective Intelligence and Spatial Mobility in Mechanics and Organics Traffics. *International Journal of Academic Research in Environment & Geography*, 1(2), 80–91.

Copyright: © 2014 The Author(s)

Published by Knowledge Words Publications (www.kwpublications.com)

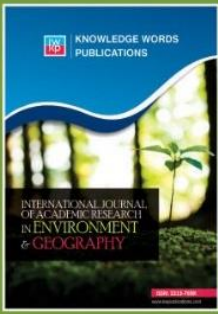
This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licenses/by/4.0/legalcode>

Vol. 1, No. 2 (2014) Pg. 80 - 91

<https://kwpublications.com/journals/journaldetail/IJAREG>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at
<https://kwpublications.com/pages/detail/publication-ethics>



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ENVIRONMENT & GEOGRAPHY



Collective Intelligence and Spatial Mobility in Mechanics and Organics Traffics

Gabriel Kelton

Londrina University (UEL), Brazil, Member of The Human Geographical Society of Japan, CAPES
Foundation, Ministry of Education of Brazil, Brazil
Email: kelton.gabriel@gmail.com

Abstract

The inquiry aims to ponder on the nature of human displacement in space and how the road scheme is applied by direct reflection of the basic mechanisms of human awareness as its base (philosophical, religious and political). The justification of the work is realized in contributing to reflect about congestion of car transits in large urban centers, bringing small contributions based on reflections on comparative examples and readings on the subject. The concept generated by the Theory of Swarms has been influencing how the logistics of transport should behave to improve their activities in a more economical way, and therefore, this research proposes reflections on the organic movements of animals collectivities (swarms, shoals, etc.) and mode of transit in most Asian cities which can help societies in big towns facing a major problem for their city: automotive traffic jams.

Keywords: Traffic, Congestion, Collective Intelligence, Urban Mobility.

Introduction

At present, one of the major problems of society in big towns with economic and population rise has been congestion of traffic. It is an indisputable fact and irrational. Take, for example, 2 hours to go about 5 miles by cars in big cities at rush hour is normal, while a pedestrian could go the same distance in the same time or faster. This issue is extremely complex and controversial, as well as are many social and philosophical conceptions to face this solution. There are economic factors on the part of those who sell and those who buy automobiles; there are ecological factors by people who care about the environment and those who do not want to take care of the future of the city; and there are also social factors between those who can buy and who has the most difficulty in acquisition of mobility equipment.

When we analyze the major cities of countries such as India and Vietnam, we can see that congestion is not a crucial factor of everyday life. They do not line up or care about strict traffic rules. People tend to evade places with stationary flows and search for empty places. The

locomotion of these systems is curious because it causes traffic that is seemingly chaotic, but "within the chaos there is a discernible order".

This paper aims to reflect on the similarities between the transit of animals with sharp collectivity and humans. What can we learn from nature in relation to spatial mobility? Can the comparison between the transit of ants or fish with human traffic bring some contribution to the problem of congestion? Driven by these questions, we intend to present some suggestions for reflections.

Organized Traffic Rational Mode or Spontaneous

The design of traffic in each country was done with rules and laws, which can be called mechanical traffic. However, when these rules are not applied and the traffic works beyond this type of official rules, transits can be called "organic". Coincidentally, or due to influential factors, many countries have this kind of traffic "without rules". India and Vietnam are two examples to be studied here in this work with exemplifications.

The concept of "collective intelligence" is usually applied in the study of harmonic behavior among groups of similar biological systems, such as bees, fish, birds, humans, *et cetera*. The union of body systems shown on the basis of all biological cells and now expressed in similar living bodies (Fig. 1), as animals and even humans. This is expressed by the concept of "association" by Georg Simmel, stating the simple fact that people are together regardless of the reason (Simmel, 1979).

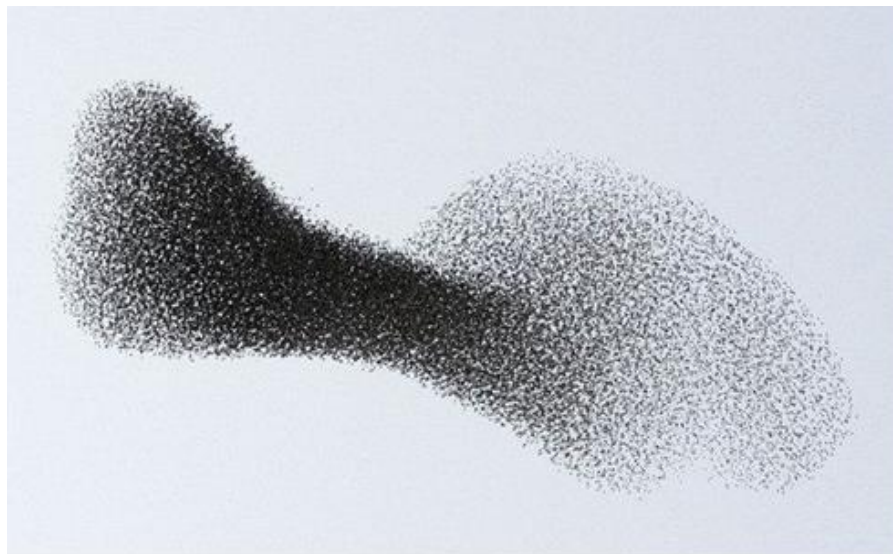


Figure 1. Birds fly together and sync to escape Hawk predator

Source: Manuel Presti in Miller, 2007, p. 36

Organic traffic differs from mechanical traffic due to its fluidity and functionality without certain rules. The signage is often a mere formality that is not taken into account in many Asian countries. The harmony in these types of systems is critical. A component that is "off" the collective movement can result in a traffic accident. However, they are usually not serious accidents because the speed in this type of traffic is always moderate. For this reason, Organic traffic rarely results in major accidents.

The difference between groups of movements in these two types of transits is that the mechanical symbols and signs determine the movements. Organic traffic has the presence in the empty space at the right time, feeling the collective movement by deduction and spatial intelligence displacement.

Pay more attention to other than yourself, this is a basic factor linked to human nature since the beginning:

In the structurally simpler societies, man, for their survival, depends directly on the accuracy of his senses, the agility of their movements and the rapidity of their bodily reactions. For hunting, for example, early man depends directly on sense perception and action of your body, and, likewise, to detect approaching enemies, through the seizure of ground vibrations. (...) The dependence of primitive man in relation to nature brought an identification with this, which causes it to give him human qualities (Gonçalves, 1994, p. 15).

The human brain has a spatial intelligence as property orientation, much like the compass, or the orientation of birds by magnetic fields, but the human brain in the city is not exactly fixed on magnetic north but in spatial reference points. A building, or where the sun rises, and are always oriented information that may be present in the consciousness of those looking for spatial orientation. But innate human faculty is increasingly limited, and less than animals like canines for example, that use other types of sense of direction. However, it can be sharpened and exercised didactically with exercises to develop space-time concept and travel speed (Viana; Melo; Viana, s/d, p 431-2), perhaps useful for developing psycho-motor classes to remove the driver's license.

Man learns in their daily work, to appreciate the fact that you can manipulate some objects in a certain position better than others. Consequently mobilize your body until the object reaches the best position for your effort. His experience allows you to thoroughly map the space around your body. With the aid of this imaginary map, it will trace its way through all the combinations of effort necessary for their work and their general conduct and by the end of the process, so feel free will is - his kingdom in this effort as if it were his native city, where every street is known to him, which possibly recognize each of the houses and most of the inhabitants. (...)

Apart from the pace - space motion, we must consider its rhythm in time. The attitude of man against time is characterized on the one hand, the fight against it in quick and sudden movements and on the other, by condescension towards him, with slow and sustained movements (Laban, 1978, pp. 195-6).

Spatial intelligence is associated with the basic neural elementary component, present in most animals moving through Earth's surface. The neural vision-motor system controls much of the action movements obtained through the senses and sets decision making (Vickers, 2007, pp. 17-31). And certainly the drivers of organic transits exercise more is human property, and by be innate to man, certainly does not require great energy to run, it is not being assimilated but exercised.

The Space collective intelligence depends not only entering into communion with the movement of a group but also individually be able to understand the other's motion and get around without shocks or collisions. "Understanding the energy flowing in the group is essential for the work to develop (...). Though the goals are similar, one should not forget that they are

individuals with particular expectations" (Guiselini, 2001, p. 79). Certain level of intelligence to handle a vehicle is necessary, but it is the attention, which certainly is more important than superior intelligence (Drew, 1968, p. 27).

It can be noticed that spontaneously drivers in Vietnam (Fig. 2) are grouped and seek to follow a similar sense of direction. When one enters the space obstructing the passage opposite the group that was in the molds to hand grouping crossing in front, without disruption of flow or accidents.



Figure 2. Traffic in Vietnam motorcycle move together to accentuate group and achieve the opposite flow time all fall in accordance with the movement of the first indicated in blue
Source: Google/YouTube: "Transit Vietnamese", 2013/marks produced by author

There are also more complex exemplifications, such as India. It can be noticed that in addition to pedestrians their animals that can be related and interact with the transit of natural and without rules, obeying only the instinct. Transit besides being mixed situations presents extremely curious direction, as in the case that pedestrians going towards car moving and simply deflect or reflect without worrying who's right or not (Fig. 3).



Figure 3. Traffic in India - Pedestrian going in the "opposite" of the flow of cars, and animals such as cows can interact with the traffic without causing accidents

Source: Google/YouTube: "Incredible Indian Traffic"/marks produced by author

The Transit Space and its Nature

The transport and mobility were the central focus of the great development of capitalism in the post-1945 period. Getting meant to evolve economically, because only in this way it was possible to send and receive goods (OWEN, 1975).

The moment the urban-industrial cities are beginning to take shape and their functions and spatial hierarchies differentiated earn highlights the intentions of mobility within the structure of the city: streets, squares, blocks and filled lots of commercial, social and private entities are sharply designed and mobility depends almost exclusively on road systems. The road system in traffic basically differentiates between divergent points (which drains flow to other routes), convergent (which receives the flow of various routes and channels into a single channel) and intersections (which receives direct flows and flow all) (Sarem, Seplan, 1982, p.44).

In the design of roads and signals the flow of public roads is a key factor in the management and control of traffic in western countries. Spatial checked items for this analysis are: parking, loading and unloading, mandatory stops, and the nature of motion are: convergent, divergent, crossing differentiation speeds. These items behave variably by: overtaking opportunities (related to the number of available lanes and visibility and slope) and differentiation of types of automobiles such as trucks and cars. Another important factor for the flow are the lateral lane restrictions, lack of shoulder, or obstructions (Soares, 1975, pp.112 - 154).

Designers and urban planners often seek to trace the road system taking into account not only its functionality but also its form (aesthetics). The geometric configurations of the traces of some cities are clearly artistic expressions (Boaga, 1977).

Demand is also influenced by the physical distribution of the city and the ways and means of transportation that are available for people to network. On the one hand, the network of pathways is large, people have become car with many possibilities of displacement. If, on the other hand, the network of public transport is very limited, people who depend on it fail to reach many destinations and are limited in their choice (ANTP, 1997, s/n).

In this sense congestion are largely due to the established rules and especially the width and length of the automobiles and its lack of agility in a little space, which results in a smaller number of people and cars in a given space . On the other hand, the flow of organic traffic has a large number of people and vehicles in the same area and especially with particular greater flexibility due to the absence of rules and also many small cars and motorcycles.

The Personal use of Space and Time as a Condition of the Collective Flow

The search for greater urban mobility in specific projects for bicycles and pedestrians dating concern already present in the United States in the 70s (Kraft, 1975). For the mobility of pedestrians is important not stop runners nor stand still. Pedestrians, Marathons, motorcycle rallies represent far more people in less space, more mobility and therefore more speed. The same concept could be used to automobiles if they were smaller and more versatile.

However the cars are different at the time, has more specific goals and its usefulness in transit can only be coherent if it can perform its function, which in the early industrialization was seen as a simple machine to carry:

Any machine is designed, built and perfected to perform with efficiency and economy working powers. The speed at which the machine performs this work is one of the conditions of its efficiency. The vehicle - carrying machine - will therefore be much more effective in making shipping faster than you intended, or loads of people at lower cost (Gadret, 1969, p 23).

The epistemic understanding of belonging to a body unison in traffic and your connection may be tied to Buddhism in Asian societies. This feeling is of paramount importance for the implementation of organic traffic. Small cars are not enough , you need to develop the driver the ability to perceive motion and achieve the set spontaneously form groups of direction in a "chaotic", or even "anarchic" time, because this concept is not only apparent "disorder", but the possibility, alternative, autonomy and thus the expression of *autopoesi* on life.

A crucial element in an anthill, for example, is the fact that nobody is in charge. There is no general leading the ant soldiers. No managers controlling the workers. As for the queen bee, its only function is to lay eggs. Even with half a million ants, a colony functions just fine without any control system - at least nothing recognizable accordingly. Instead, the functioning of the colony is based on countless interactions between individual ants, each following very simple rules of thumb. Scientists describe such systems as self - organized (Miller, 2007, p. 40).

The difficulties of the Western mechanistic thinking to realize the order in an apparent "chaos" dating mainly from cultural differences between East and West. Between "civilized" and "primitive".

In Eastern civilizations, man's relationship with his corporeality differ from those of Western civilization. Based on the mystical traditions of Eastern thought, the experience of the body is seen as the key to the experience of the world and into the consciousness of cosmic

totality. Knowledge of the world is based on direct intuition of the nature of things, in relation to the world that intensely involves man as body and sensitive (Gonçalves, 1994, p.16).

There are difficulties of Eastern holistic thinking to be guided by symbolic signs, which are bureaucratically traffic stop even with no cars in preferential flow. In India, the deployment of signalers often not merely decorative landscape elements. The traffic is elaborated according to the movement, stopping and proceeding are determined by time and not by chronological accuracy of signalers.

The Geography of Organic Transit and Box System Concept of Mobility

"I seek space and enter, if I went, others cannot be in same place", so the driver acts on organic influences, and how the space is suitable for a certain time and used later by another must in turn respect the laws of physics. The space is for the collective use and with attention to himself the driver thinks and acts in accordance with a dilemma: "if each one taking care of you so you do not hit another no accident." "The fish follow simple rules that leave the group on alert: stay together, avoid collisions and swim in the same direction " (Miller, 2007, p.44).

The mechanical traffic is mainly characterized by the fact of using a specific road marking, which is sanctioned by law and symbolically and legally recognized by all who can drive cars (Guerrera, 1980). Herein, the first sign of lights opened in Cleveland in the United States in 1914, as the signalman, which is characterized by a stream pause to open another stream was opened in 1918 in the city of Salt Lake City. This model is still of paramount importance for the control of traffic in large cities (Gazis, 1974, p. 176).

On the other hand cities like Lima in Peru, for example, use very signaling by sound. The hooters are as sound signals occupying space in time. Synchronized swimming is an example that synchrony between members of a group does not only occur through visualization , but a set that involves the rhythm of sounds and especially the time to act in the right space (Spears, Gabrielsen, 1969, pp. .167-188).

Using these rules also signals the elusive light and sound and the curves made to divert the other elements of the organic traffic route within a goal are the fundamental pillars of better traffic flow. The pedestrian flow is an example of organic traffic that self – organizes and versatility due to the body promotes an enviable fluidity to car users in certain situations. Areas in the cities were designed only for the movement of pedestrians, are popularly known as "pedestrian", which are usually full of trade (Brambilla, Long, 1977). Pathways in an organic traffic may also have a multifunctional use of various types of transportation between pedestrians and animals can be bicycles, motorcycles, mototax, cars, trucks and buses. There is, in these cases, separation between bike paths, roads and sidewalks. All use all the space.

Decrease the size and shape of cars, leaving them with greater versatility and oval, allowing the offset in groups, can be a reflective contribution to the problem of congestion in big cities instead of casters can deploy to areas of unique traffic small cars.

The problem of cars in urban areas derives mainly from the fact that the cities and the layout of its streets were designed, in most cases, before they could view the demands of the new type of vehicle. However, even when the growth of motorized traffic became obvious inadequacy of expressways, the prospect of going beyond superficial measures seemed superior to existing materials and financially speaking opportunities.

The result was that most strongly pressed municipalities saw in the contingency to improvise solutions when adopting major programs of new works would only be sufficient to meet existing needs. But the current system of expressways was designed primarily for the purpose of bringing the chain to the center, as required before the flexibility of individual transport became obsolete this traffic pattern (OWEN, 1971, pp. 55-6).

Keeping the concept of sense of direction and remove the concept of queues would be essential. To widen this road tracks and narrow the urban vehicles, would be necessary. And define sizes and circulation areas wider vehicles, motorcycles and narrow and leave vehicles organically organize themselves in places of greater flow, would not the result of congestion, such as which water of a river between stones possible, meaning flow was constant (Fig. 4).

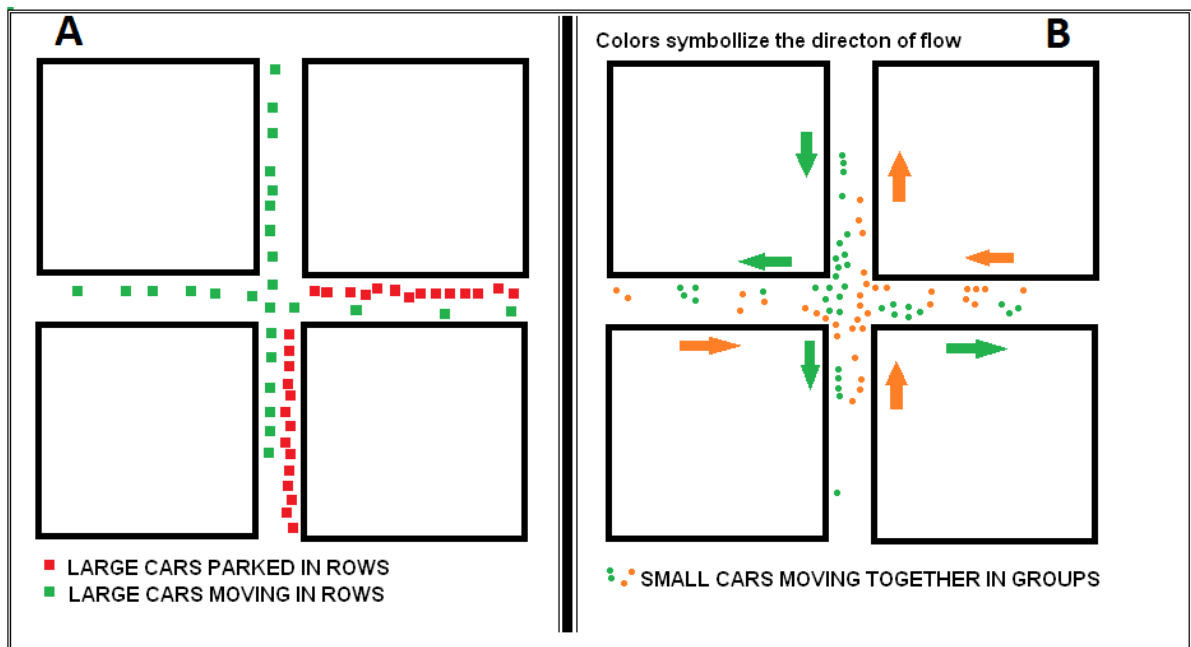


Figure 4. Example A: Transit mechanic/planning and queues; Example B: Organized by organic traffic direction, spontaneously formed groups of locomotion

Compiled by author

In example A the points mechanic transit and his need for order and queues and example B shows the dynamics of organic transit with no sense of queues and organizing only spontaneously forming groups by the direction of locomotion that crumbles under the necessity of occupying space.

Examples of versatile cars can be found easily, especially in Japan, where the concept of compact cars are extremely important and everyday functionality (Fig. 5).



Figure 5. “Box System Concept of Mobility” - The Honda Micro Commuter is a new concept of compact Honda brand and carries a machine to transport people to laptop in transit along sidewalks for pedestrians, while gaining mobility and agility

Source: CARANDDRIVER, 2013/produced by author

Motorcycles covered leaning curves are also part of this new concept, because it is a mix of car motorcycle, and allows a great traffic flow (Fig. 6). Safety in accidents is almost always related to the low speed of these small cars and so there is little risk of fatal collisions because the movement is largely whole and continuous.



Figure 6. Car with size and speed motorcycle (Lumeneo Smera)

Source: TADEU, 2009/produced by author

Determine transit zones determining the center of increased flow due to the small size of the motor, and the rule that only the direction of the roads to be maintained, and linear logic queues are replaced by organic traffic. Larger vehicles with more power and could walk only on intercity highways and towing small cars to areas of higher flow, when you want to come in bigger cities. For this there should be parking near the busiest bands, or for residents of neighboring towns. Motorcycles have free access to all areas. Cities like Lima in Peru delimit the historic center just for flow of cars, motorcycles are banned from the roads due to the apparent chaos in equity cityscape.

This line of reasoning may suggest the presence of dedicated lanes for trucks loading and discharge organized in rows, and also collective, and both, through the tracks have coherence and usefulness in advance through the transit zones. Cars, on the other hand, large squares are usually almost empty boxes that occupy large space and congest traffic. Therefore, one can think of gradual zoning that reduce the size of the motor, following the logic of motorways (city pairs), central pathways (road system within cities) and central promenades (for flow of pedestrians and automobiles portable as motorized roller skates) (Fig. 7).

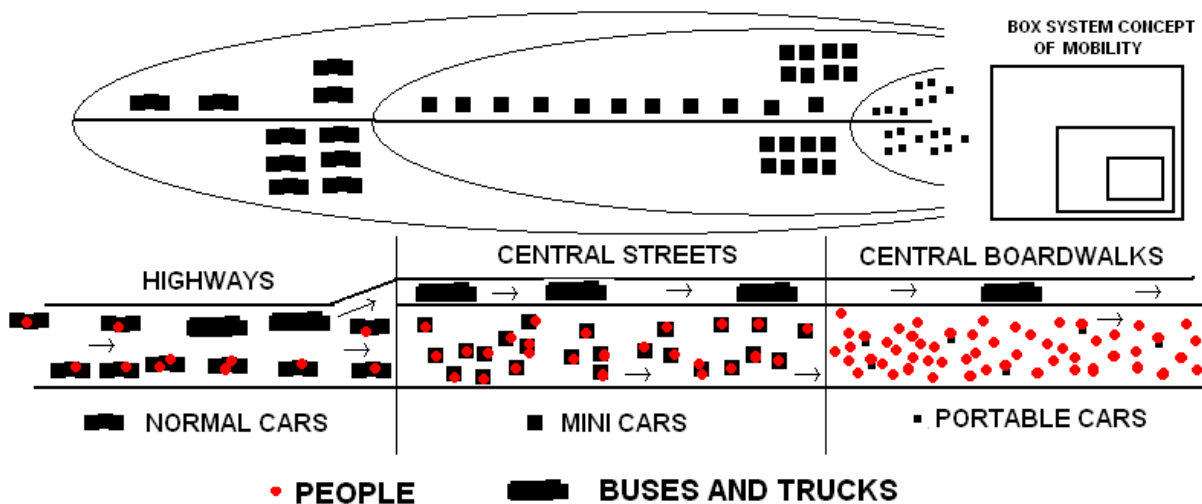


Figure7. Scheme of the Mental zoning with gradual reduction of the size of the motor and rules of organic traffic to decrease congestion

Compiled by author

Use only the space required results in less energy and more progress in the flow, and consequently spent less time in commuting. Organic traffic and self - organization can be an important contributing factor to reflect on the great attempt to solve the problem of congestion in towns and cities, which together with the profitable progress because of the economy, on the other hand, many losses especially in energy and lifetime.

Final Thoughts

The problem of congestion cannot be solved with this single reflection, but with the option of smaller cars with more versatility and less strict traffic rules to enable agile and elusive careful, you can take an important step towards improving the flow congestion. The apparent order is not always the best solution, the ants do not walk in straight lines and have a great flow,

even appearing to be in chaos, rising one above the other. The experience of more than 100,000 km on motorcycles, in transit by highways or within large cities gives pragmatic support this research for a better understanding of what actually size and agility of the car can result in no need of facing traffic jams and congestion, formed mainly by the size and obsolete and unnecessary use of flowing space, which increasingly is becoming a rarity of great value in the urban space.

References

- ANTP – Associação Nacional de Transportes Públicos. Transporte Humano: cidades com qualidade de vida. São Paulo: ANTP, 1997.
- Giorgio, B. (1972). Diseño de tráfico y forma urbana. Barcelo: *Officina Edizioni*.
- Brambilla, R., Longo, G. (1997). For Pedestrians Only: planning, design, and management of traffic-free zones. New York: Whitney Library of Design.
- Drew, D. R. (1968). Traffic Flow Theory and Control. St. Louis: McGraw-Hill Book Company, 1968.
- Gabrielsen, M. A., Spears, B., Gabrielsen, B. W. Deportes Acuáticos. Serie T – técnicas deportivas / coleção Herakles. Barcelona: Editorial Hispano Europea, 1969.
- GADRET, Hilton J. Trânsito: Superfunção Urbana. (1974). Rio de Janeiro: Fundação Getúlio Vargas, 1969.
- Gazis, D. C. (1974). Traffic Science. New York: John Wiley & Sons, 1974.
- Guiselini, M. (2001) Integração do Corpo. São Paulo: Editora Manole, 2001.
- Laban, R. (1978). Domínio do Movimento. Edição organizada por Lisa Ullmann. 5ªed. São Paulo: Summus, 1978.
- Kraft, W. H. (1975). Planning Design and Implementation of Bicycle and Pedestrian Facilities. Proceedings of the Fourth National Seminar. December 4-6, 1975. New Orleans, Louisiana.
- Miller, P. (2007). Teoria dos Enxames. National Geographic Brasil. Ano 7, nº 88, julho de 2007, pp. 36-57.
- Owen, W. (1964). Estratégia para os Transportes. (trad. David Hastings) São Paulo: Pioneira, 1975, (orig. 1964).
- Simmel, G. (1979). A Metrópole e a Vida Mental. In. VELHO, Otávio Guilherme. O Fenômeno Urbano. 4ª ed. Rio de Janeiro : Zahar, 1979, pp. 11-25.
- Soares, L. R. (1975). Engenharia de Tráfego. Rio de Janeiro: Almeida Neves-Editores, 1975.
- Vickers, Joan, N. (2007). Perception, Cognition, and Decision Training: the quiet eye in action. Champaign: Human Kinetics, 2007.

Electronic addresses consulted:

Google/Youtube: Trânsito Vietnamita. Disponível em: <

<http://www.youtube.com/watch?v=jSNo0EAlt1U> > Acesso em: 02/07/2013.

Google/Youtube: Incredible Indian Traffic. Disponível em: <

<http://www.youtube.com/watch?v=KnPiP9PkLAs> > Acesso em: 02/07/2013.

CARANDDRIVE. Honda Micro Commuter concept. Disponível em: <

<http://www.caranddriver.com/photos-media/432287/honda-micro-commuter-concept-photo-432382> > Acesso em: 11/07/2013.