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**Fragmentation of Land:  
Urban Transport Perspective**

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### **Abstract**

The mobility in cities has been fueled by the technological advances, giving as a result big territorial changes. These phenomena have abruptly changed the old ways of conceiving the city, which is the same as to materialize in the space fragmentation, socio-environmental causes.

This spatial restructuring tends toward a more dispersed and fragmented city that manifests itself in different ways. In this paper we present an approach of this fragmentation characterized by the urban structure and transport in a case study of the city of Hidalgo Ixmiquilpan in Mexico.

The daily mobility corresponds to the ratio of transfer to the economic, productive and social and how to meet it must be planned with a sustainable perspective associating urban structure with the environment and society, in a way that integrates the city.

**Keywords:**

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## **Introduction**

Humans have invaded the ocean, have explored the space, but the earth... we are only beginning to know it. In spite of being in the era of information and technology, in a small, medium or large city, a simple traffic jam still stops us.

The rapid growth of cities and the increase of use of the particular cars have generated cities that are neither articulated nor integrated. It is need to create mobility and transport system according to models which aim to meet daily demand of trips based on sustainability.

That is, allowing the relationship between city and environment-users. In this paper, we present a study about the fragmentation of a small city of Mexico which was identified considering the transport relation, infrastructure and land use.

## **Ixmiquilpan, the transformation of a village into a small city**

In 2010 about 72% of the Mexican population lived in cities. According to CONAPO and the National Urban System, in that year there was 384 cities ranked as follows: 59 metropolitan areas, defined as 78 cities and 247 towns conurbations known as urban centers or small towns, Ixmiquilpan is in the latter classification, are these kind of cities which can help us to from the local to the global, as it has great potential for development.

On the other hand, from the geographical point of view Ixmiquilpan has two big natural barriers, the first is the Tula river and its tributaries and the second is the Pan American Highway, which makes the urban part is fragmented. Thus we find a first territorial geographical breakdown. See figure 1.

The problems of land uses that are presented today in Ixmiquilpan are the legacy of the past, caused by the rapid growth of this city. From being a population of about 7,000 inhabitants (denominated village, regardless of profound methodological definitions) in the early seventies in forty years it just developed into a small town with over 32,000 inhabitants, but without a land use plan or development. The types of land use that were originated in the town of the city were mainly institutional and residential, however wit's the rapid growth of the city, the latter was becoming gradually in commercial. So that, when mutated to a pattern of use that was not considered in the original infrastructure it created a juxtaposition of features and problems arising from the same, as are the urban structure and how to design the city, this is the artificiality of its configuration and functionality. The current mix of uses results in a low population density and central agglomeration of space dedicated to commerce and services, while in the periphery have they not unplanned residential areas.

In addition to this, we have a issue more on the roads and with public transport. We have noted the absence of well-established stations with characteristics of public transport, in the absence of these it has occupied the public space of the road that is not designed for this, see figure 1.

The public transport contributes to the congestion that occurs mainly in the center of the city, increases to the visual pollution and degrades environmental as well as the quality of life of the inhabitants. The quality of transport –from the point of view of comfort, price and friendliness – is dissociated from the mobility and the services.

### **Fragmentation in the city or the fragmented city**

The city is a set of elements of the natural world almost extinct and we have built an artificial world, this is not only a object of appreciation for a society so diverse, but also is the product of various agents who have constantly changed its structure because of different needs and functions. In diferents times and circumstances, the city is transformed, so, in every period of the history there is a different city, Lynch (2004).

Today in the cities, the conception of public open space has been changed by the space that is offered by shopping centers, leading to abrupt changes in the way of exchanges, therefore, the way to think about space has changed and there for various aspects of daily life such as these "shopping centers or malls" are spaces of consumption and not meeting spaces, where the main activities are impersonal shopping experiences instead of exchanges.

According to Hiller (2007 p. 141) "the spatial configuration influences the movement patterns in the space and the movement is by far the most dominant way of space utilization." This movement is for us the mobility and that in its most elemental conception is given by nature, namely by one's basic needs we have as human beings: food, clothing, ceiling, recreation, working, etc.

Therefore, the space is modified according to the inherent basic needs of humans, in this way the city is constantly in motion and transformation, thus generating incompleteness processes that fragment social relations and thus the territory.

In recent decades is discussed in different ways on the fragmented city, Borsdorf, (2003), speaks of a new model of the structure and development of the Latin American city, and conceptually defines the city, with a category of analysis "gated communities". This is a modern way of thinking about the city, caused by the impact of global processes such as the economic crisis and poor accessibility. This phenomenon is a clear trend towards fragmentation of the urban form. Furthermore, these processes also have to do with social insecurity that exists today in the cities.

Latin American society in history has presented trends of separation and exclusion, arguing with the old "patio homes" from the colonial era, Borsdorf, (2003 b.). At present there are also popular areas that integrate much of the city and not just confined spaces, which are clearly fragments of a fragmented city.

Without any doubt the economy plays a key role in shaping the cities, Prévôt Schapira (2000) attributed to economic growth, land fragmentation in various cities in Latin America, based on an essential question, what if the urban crisis is causing a different model of city? From the perspective of urban accelerated

growth in cities, no doubt we are in this deep transformation from the culture that is embodied in the territory. According to Odette Carvalho (2001), the city is fragmented with respect to social and cultural because of it is suffering an innovation process towards the metropolis, caused by the needs of urban-industrial society, where there are changes in the urban structure at high scale (eg large avenues, boulevards, bridges, viaducts, malls), from this perspective the city has fragments within the city, characterized by loss of cultural patterns, for which the city is fragmented in its social and these are poured into the territory unequivocally to realize the concept of the city.

In this relationship that exists between social processes and spatial fragmented forms, is presented a dialectical phenomenon, in some cases, fragmented urban structures or fragmented cities affect social processes, and it the same thing that affect the fragmented urban structure, due to the very essence of the city that is the product of these socio-spatial transformations (Garrocho 2011). Becoming in a codependency, where the fragmented city produces social processes such as poverty, segregation, among others, which produce more fragments in the city.

Furthermore, to Bähr and Mertins (1982) (quoted in Buzai p. 81), peripheral growth has had a significant impact on the characteristics of settlements and structures of urban land use, which has been defined through three different spatial patterns partially overlapped: Buzai 1982 op. Cit., Pp 82.83

In the last three decades has displayed a pattern of fragmented city. From where a socio-spatial interpretation on the Latin American city setting arises, considering aspects of fragmentation derived from studies of German geographers, posing as another result of post-modern culture tech hic man seeking comfort and freedom. This is, as socio-cultural product which not only shown in the way of conceiving the city, but also as legacy of unfinished urbanization processes.

The last decade of the twentieth century had a common factor, which is possible to attribute the responsibility for the process of urban form present in some cities, this is the process of privatization, this phenomenon has generated a number of islands in the inner city: residential islands, consumption islands, production islands and decay islands, thereby generating a new urban model, different from a few decades ago, but which is based on the compact city, Janoschka (2002) (quoted in Buzai p.100).

Although not defined in this way, for us it is a phenomenon that fosters precisely the fragmented city, islands or what we call "city fragments". This result in the territory is visible as a fragmented city, which is the result of a urban transformation unfinished process of different Latin American cities, among them Mexico.

### **The urban space in the Mezquital Valley**

Ixmiquilpan, whose name in Nahuatl means a place which is abundant the purslane, is located in a valley bathed in the river Tula. The territory is located



in what is called the Valley of Mezquital in Hidalgo and its strategic location in the middle of this area makes it a regional center of trade mainly consumer goods. According to (Castillo et al., 2011), the location of the territory of Ixmiquilpan has become a regional center for supply of goods from these municipalities, and therefore service. Besides being a place of passage for northern municipalities of their boundary.

Each space in the city is different, either by natural physical characteristics, or artificial, as well as for social interactions that take place in this. The phenomena which manifest with territorial-spatial changes, such as segregation, population growth, deterioration of the central area, among others, make the urban environment complex, which highlights different territorial attributes, one of them is that this is not neutral, which is a reflection of the project of each society, ie responds to a time and the complex relationships between society interacting with each other and with nature. (Fernandez et. Al., 1999).

At first, the urban structure of the city was basically a manifestation of an adaptation created by people from the transformed natural space. And we tailor to our needs we build an artificial space to develop fundamental social activities, which is adapted to our needs through an artificial space we build to develop fundamental social activities.

According to Hiller (2007 op. Cit.) The correlation between space and society, is located on the collective relationships between organizations of the people and the space configurations, ie, not individually of activities. The structure of urban space is given from a spatial image of a certain social process. The urban structure in this duality is produced by society, but also supports the playback of society, which becomes a cycle of it.

Thus, the urban form presented in Ixmiquilpan, as in many other cities, is a result of various factors, such as cultural, economic, social, topographical issue, the environment. According to Bassols (2011: pp. 20,21) currently the city is modified and lived by the society that in its development of daily activities throughout the territory, delineate the new zones of urban fringe, further they also raised remodel its historic center, trying to fit the architectural and cultural trends with planning of areas of activities of the society, industry, services, commercial, recreational, which includes citizens participation

This accumulation of daily activities, when referring to land use talking about what happens and what develops in a space (activities), rather than the characteristics of the buildings that house these activities, perhaps these were not built to that propose, but that with the passage of time, were hosting various activities. According to (Garcia, 1993) op. Cit. when talking about land use he refers to activities that take place in the territory, rather than adapted spaces that house.

According to our conceptual categories of analysis performed, squares, roads and pedestrian walkways are quite public places of the city. A function of public space is to connect different spaces and this task can be done in a simple, and harmonious way or in a complex, way that gives meaning to the relationships. The square is considered a living entity, constantly evolving with

time variations related to socio-economic conditions of society and the environment in relation to the evolution of the technology which is used in new buildings and in the transport system. Thus, changes may occur even in the morphology of these spaces. However, in these transformations, the principal places that are changing are around the square, but even to a lesser extent the same square, but the "urban space will remain itself" (Bazant, 2008) p. 19.

In Dhuau views, (2008), this concept refers to the contemporary metropolis where the traditional public spaces such as the square and the streets are becoming less attractive to middle and upper sectors of the population. They think that these places are risky and annoying, where urban sociability also tends to lose its meaning.

In the case of Ixmiquilpan city, the public space divides the city hall from the church; they are the 3 main actors of a city. This public space is a space of encounter and connects cathedral and municipal government palace.. And they give form to the historic center or core of Ixmiquilpan

What surrounds the square or what is located around it, first are the roads, which is the support of traffic flow that occurs in this space and continually there are shops and services. With this spatial configuration, the space public becomes a point of meeting for vehicles, because it hasn't achieved a pedestrian space.

However, it is losing the sense of an open public space as a meeting place since it is becoming only a place crossing point and reference, which is located in the center of the urban space Ixmiquilpan city. Hiller (1999) in his theory of the "centrality as a process," that the center where retail purchases are performed, which benefit from the movement and expresses greater need for space, even more than above others activities such as administrative or religious office. Thus generating pedestrian movement, is generating so that is convenient in social meeting areas, recovering the space to fulfill their duties.

The current structure of this space causes a socio-spatial fragmentation associated with unplanned transport step that with its externalities damage the urban image, which is an observed manifestation. Although dialectically, transport connects Downtown with the rest of the territory, but at the same time it causes fragmentation, losing the use of the space as a structurate entity of socio-environmental relationship.

### **Urban transport as a reflection of the city**

A large number of Mexican cities suffer severe deficiencies and shortcomings in their urban transport systems. Such shortages are the result of two reasons, on the one hand, the oppression of the capitalist system on urban development and all that entails. On the other hand, according to the transport role as an intermediary between the reproduction of capital and labour, ie transporting people to develop productive activities (Gordon 1971, Fernandez 1978, cit. In Carrillo 1994 ). Thus, transportation has encouraged the development of economies of scale and agglomeration.

At the same time, the development of economies coupled with the lack of government policies on urban transport, have favoured to various sectors of capital for example: a) The automotive industry in as much as that the citizens opt for private modes of transport due to urban transport having an obsolete fleets and any deficient in most the cities. b) The construction industry, which is favored by the increase in roads that host these private cars (becoming a cycle, more roads, more cars, more cars, more roads), Ibid Carrillo (1994).

Thus in this process of the dynamics of the city, the transportation facilitates the mobility of workers (who reproduce the capital or wealth) to their work areas. The transportation meets the task of displacing workers, arising from the need to cover this economic activity and that is demanded intrinsically by workers, Navarro (1994).

In general, we say that urban transport is not a service that has an end in itself, we can say that is a marketed service that people have to pay to use, particularly the workers, who have to invest a part of their salary every day, which affects their purchasing power, Navarro (Ibid 1994).

Therefore, one of the main objectives of urban transport as a public service, should focus on providing a service of quality and comfort and not just meet travel demand, also the government should provide a minimum subsidy as it does with other basic services.

According to Lopez (2008) mobility is a concept related to persons or goods traveling, this term is used interchangeably to talk about the provision of travel or as the measure of.

The daily mobility is generated due to the natural need to survive, and daily urban mobility is this need to survive and move into the city by different modes and means of transport. These essential needs of humans are housing, work, recreation, socialization, among others. So in essence, the mobility requires a physical space and time to its development. According to Amar (2010), the place and time where mobility is done, they place it as the basis of economic, politic and social exchanges.

The transport externalities such as road accidents, traffic congestion, pollution, among others; find their causes in different variables such as the irrational use of private transport as a mode of urban transport, the obsolete infrastructure and poor public transport, the disorganized and deficient management of transport, as well as, the urban form that tends to centralize.

These are just some of the issues and variables, not only about transportation, but also the mobility of people, thereby affecting the functionality of the city, thus becoming a wicked circle between mobility and transport problems, López (2010).

## **Conclusions**

The rapid growth of cities and urban sprawl have generated, on the one hand, that displacements to meet certain needs of the population are increasingly long and it is vital to invest more time. And on the other hand, that accessibility is

different between different areas of a same territory which called city. A variable that is present in the model of a fragmented city and plays an important role, but is not highlighted, is the transport and its structure. Because it not is taken up in any of the cases we've reviewed and is a determining factor for the formation of each type of city, with elements such as mobility, accessibility, segregation and integration. However it has been one of the more important variables in shaping of the city where we live in today, a fragmented city.

Ixmiquilpan heritage of the past represents the loss of public space as with other cities. Furthermore, as a reflection of this loss, there is little intervention on public transport, which instead of integrating the different parts of the city, is fragmenting it further. The little space for public transport, disorganization, poor planning of routes and an obsolete vehicle fleet, are just some features of current transport in fragmented city. So a design of a evolutionary transport system would favor the integration of the city. This is the way how the urban transport not only should fulfill this purpose, but also integrate the city socio-spatially, being the reflection of a harmonious city.

The transport and the urban space of Ixmiquilpan generate urban conflicts due to the lack of order and optimization operation of public transport and the structure of the city. As well as poor planning of the routes, that it is done without technical studies, which is observed in a public transport service versus dissociated demand for mobility, the impact of which is presented in space unequivocally as a functional fragmentation of transport in the territory.

The mobility generated in Ixmiquilpan is due to two reasons, on the one hand, the daily mobility of the city, and on the other hand, that is a distributor of goods which has a market that not only supplies food to local customers, but also customers from near regions. As a goods distribution center, Ixmiquilpan works like a local and regional strong magnet, its location in the Valle del Mezquital makes it a strategic territory.

The flow of daily mobility of people and goods, which are generated in the city, operate on the roads, through different modes of transport. Hence the need for transport planning simultaneously with the development plans, and that they have the ability to evolve in relation to the space they occupy, and with respect to the evolution of daily mobility demanded; the aspects that would indicate such development would be based on territorial transformation, population density, urban sprawl, urban policy and technology, so that accessibility would be a physical response-spatial and social. This conception of transportation planning is critical in urban development and land use.

## **Bibliography**

Amar, Georges 2010. Movilidad sostenible, un cambio de paradigma. En Presente y futuro de la movilidad urbana. ¿Cómo moverse mejor en las ciudades latinoamericanas?. Compilador Ricardo Moctezuma. Editorial Arte. Venezuela

- Bassols, Ricardez Mario 2011, en Cabrero Mendoza Enrique coord. Ciudades mexicanas. Desafíos en concierto. México
- Bazant, J. (2008). *Espacios urbanos Historia, teoría y diseño*. México : LIMUSA. México
- Borsdorf, Axel. (2003) “Hacia la ciudad fragmentada. Tempranas estructuras segregadas en la ciudad latinoamericana”. Revista electrónica de geografía y ciencias sociales, Universidad de Barcelona, [http://www.ub.es/geocrit/sn/sn-146\(122\).htm](http://www.ub.es/geocrit/sn/sn-146(122).htm)
- Castells, M. (1981). *Problemas de investigación urbana*. México.
- Carillo (1994). La problemática del transporte público de pasajeros en la zona metropolitana de Guadalajara. Universidad de Guadalajara. México.
- Castillo et. al, S. M. (2011). *Gobierno y desarrollo regional*. México: Porrúa.
- Cervantes, E. (1993). El desarrollo urbano en México. *Cuadernos de urbanismo* , 87.
- Duhau, Emilio Y Giglia, Angelica, (2008). Las reglas del desorden: habitar metrópoli”.. Edit. Siglo XXI
- Fernández et. al. (1999). *Territorio, sociedad y desarrollo sustentable*. Buenos Aires, Argentina: Espacio.
- García, C. J. (1993). Estructura Urbana. *Cuadernos de urbanismo* , 87.
- Garrocho, Carlos (2011) Pobreza urbana en asentamientos irregulares de ciudades mexicanas: la trampa de la localización periférica. En Cabrero Mendoza Enrique, (2011). *Ciudades mexicanas un desafío*.
- Hillier, Bill (2007). Space is the machine. Disponible en HYPERLINK "http://discovery-dev.ucl.ac.uk/3848/1/SpaceIsTheMachine\_Part1.pdf" [http://discovery-dev.ucl.ac.uk/3848/1/SpaceIsTheMachine\\_Part1.pdf](http://discovery-dev.ucl.ac.uk/3848/1/SpaceIsTheMachine_Part1.pdf) . Recuperado el 8 de febrero de 2012
- INEGI. (2000). *Hidalgo XII Censo general de población y vivienda 200 tabulados básicos tomo I*. MEXICO: INEGI.
- López, L. e. (2008). *Presente y futuro de la moviliad urbana*. Venezuela: Fundación Humana, CAF, CHACAO.
- López, L. e. (2008). *Presente y futuro de la moviliad urbana*. Venezuela: Fundación Humana, CAF, CHACAO.
- Lynch, Kevin. (2004). *L'immagine della città*, 11 va. edición. Edit Marsilio. Italia., (Original en inglés 1960, traducido al italiano por Paolo Ceccarelli)
- Navarro, Bernardo (1994). Ciudad de México. El metro y sus usuarios. UAM, México
- Olivares, González Adriana, et al. 2004. “Los nuevos territorios urbanos: consideraciones de la espacialidad contemporánea”. *Urbano*, mayo, año/ vol 7 no. 009 Chile. pp 48-56
- Prévôt Schapira, Marie-France. (2000) Segregación, fragmentación, secesión. Hacia una nueva geografía social en la aglomeración de Buenos Aires. *Economía sociedad y territorio*. El colegio Mexiquense. Disponible en HYPERLINK "http://redalyc.uaemex.mx/pdf/111/11100702.pdf" <http://redalyc.uaemex.mx/pdf/111/11100702.pdf> . Recuperado el 20 de febrero de 2010

**Figure 1.** *Barriers map*

