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# ANALYSIS OF ALTERNATIVE SOLUTIONS FOR URBAN MOBILITY: THE CASE OF MÜNSTER, GERMANY

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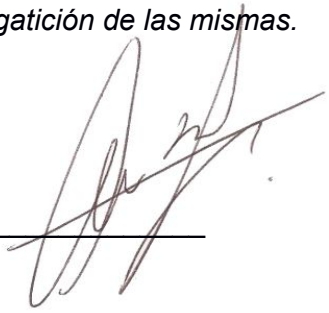

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# PART 0

# INTRODUCTION

# 0.1 ABSTRACT

Problems related to urban design and mobility are usually analyzed and solved by taking into account only its technical aspects, leaving aside the effects that every change in the urban structure cause. in terms of society, customs, education and culture in general. This rigid strategy has led in many cases the misuse of the infrastructure, misunderstandings or, in the worst cases, a widespread rejection.

Nowadays there are many manuals and technical studies on how to improve the problem of urban mobility in the world; studies on planning, shift to more environmentally friendly technologies, the renewal of the vehicle fleet and the implementation of better public transport, just to mention a few. However, even with all these researches, there are not many studies offering strategies to ensure that all technical innovations to improve mobility can be understood, assimilated and accepted by society in a more smoothly and friendly way.

Taking this into account, this research has analyzed from the theory of social construction of environmental problems, a successful case of sustainable mobility, such as Münster in Germany. Following a review of its history, strategies and most relevant actors, it was understood which were the major factors of change in the community of Münster, to move in favor of more alternative transportation means, such as cycling, walking or traveling by bus, as first choices of mobility.

For a new interpretation of the process of social construction, subscription and adaptation to the current mobility model in Muenster, it was necessary to implement a strategy of deconstruction to the modern history of mobility in the city. Thus, the historical discourse could be studied from the categories that John Hannigan set in his theory of social construction of environmental problems.

The result was the develop of new indicators to assess mthe construction of environmental problems and solutions on the topic of mobility. In the end, it is hoped that this tool can be used in further studies on cities in less favorable circumstances than Münster.

Key words: Urban mobility, bicycles, transportation, Münster, vehicles, Hannigan, social construction, deconstruction, environmental.

# 0.1 RESUMEN

Es muy común que aquellos problemas relacionados con el diseño urbano y la movilidad, sean analizados y resueltos sólo tomando en cuenta sus aspectos técnicos; dejando de lado los efectos que cada cambio en la infraestructura y en las prácticas tienen en términos sociales, de costumbres, de educación y de la cultura en general. Esta rgidez en el estudio de la planeación urbana ha llevado en muchos casos al mal uso de la infraestructura, la confusión sobre su utilidad y, en el peor de los casos, al rechazo generalizado de la misma.

Hoy en día hay es posible encontrar una gran cantidad de manuales y análisis técnicos sobre cómo mejorar el problema de la movilidad urbana en el mundo: estudios sobre estratégias de planificación, el desplazamiento hacia tecnologías más amigables con el medio ambiente, la renovación del parque vehícular y la implementación de un mejor transporte público; sólo por mencionar algunos. Sin embargo, incluso con todas estas investigaciones, al día de hoy no existen muchos registros sobre estudios orientados a ofrecer estrategias para asegurar que todas aquellas innovaciones técnicas para mejorar la movilidad, sean bienvenidas, comprendidas, asimiladas y aceptadas por la sociedad en una manera más sutil y amigable.

Teniendo esto en cuenta, esta investigación ha analizado desde la teoría de la construcción social de los problemas ambientales, un caso de éxito de la movilidad sostenible, como lo es Münster, en Alemania. Así, tras una revisión de su historia, sus estrategias y actores más relevantes, se determinó quienes fueron los principales factores de cambio en la ciudad para, finalmente, decidir adoptar el uso de medios de transporte alternativos como primeras opciones de movilidad (bicicleta, caminar o viajar en autobús).

Para lograr una nueva interpretación del proceso de construcción social en Münster; su suscripción y adaptación a un nuevo modelo de movilidad, fue necesario implementar una estrategia de deconstrucción de la historia moderna de la movilidad en la ciudad. Así, el discurso histórico pudo des-estructurarse y estudiarse desde las categorías que John Hannigan propone en su teoría de la construcción social de los problemas ambientales.

El resultado fue la creación de nuevos indicadores para evaluar la construcción de los problemas ambientales y algunas soluciones sobre el tema de la movilidad. Al final, se espera que esta herramienta pueda igualmente ser utilizada en otros estudios sobre ciudades en circunstancias menos favorables que Münster.

Palabras clave: movilidad urbana, bicicletas, transporte, Münster, vehículos, Hannigan, construcción social, la deconstrucción, ciencias ambientales.

# 0.2 URBAN MOBILITY AS AN ENVIRONMENTAL PROBLEM

According to un-inhabitat[1], the picture after the first decade of the new millennium is of a concentration of almost half of the total world population in urban environments. According to projections in recent analysis, it is expected that by 2050 the rate of urbanization in the world reaches 65%; a very hard situation for underdeveloped and developing countries. Moreover, the models of observable growth in most third world countries are characterized by the patterns of concentration of wealth and power, as well as an accelerated and improvised model of urbanization, which contribute significantly to the inefficient use of the resources and the aggravation of tangible problems such as, resource depletion, high poverty rates and extreme pollution.

Against this backdrop of urban sprawl, most cities in developing countries are far from offering equitable conditions and opportunities to all its inhabitants. Moreover, the urban population is mostly unable or limited, given the poor the economic social, cultural, ethnic, gender or age conditions to achieve their most basic needs and, of course, to develop any plan of life for its inhabitants.

As it might be suspected, these conditions of inequity are observed as well in urban mobility phenomenon; through inefficient policies that clearly benefit individuals with more resources, infrastructure of cities around the world have favored in recent decades private transportation means, forgetting about those who are carried in public or non-motorized vehicles.

Of course, this lack of opportunities and the remarkable support to the most fortunate group in society[2] have been historically accompanied by tangential

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[1] Look For: ONU Hábitat. Carta Mundial de Derecho a la Ciudad Foro Social de las Américas, Quito. Julio 2004

[2] In terms of what John Rawls (1995) calls the natural lottery. It means, the once who where born with economic, infrastructure and influence privileges that others have not.

negative phenomenon (collateral damage) such as social resentments, urban struggles, various manifestations of violence and insecurity inside the cities.

According to United Nations (UN) reports, the worldwide second problem today is urban planning of cities, their alternatives and possible strategies. This calls for several changes in systems and patterns of land occupation and planning (Barradas, 2009), and, of course, urban mobility models.

The pursuit for efficiency of these systems and models should aim to strengthen public and alternative transportation (non-motorized); however, in many cities, almost all mobility resources and efforts have been employed in the latest decades to improve individual means of transportation and, in that sense, to develop a dependence to this specific paradigm, which have, tangentially, generated an unsustainable model of mobility.

This exacerbated support for private vehicles usage has created in lots of cities around the world, a gradual process of public transportation vehicles abandonment, which has (at the same time) triggered a lawless rate of growth in the private vehicle fleet.

In the end, this is a scenario which not only implies possible crisis because of the limited space on streets and the disregarded (or null) urban planning; but also a crisis for air pollution levels given the high rates of population growth and the uncontrollable increasing vehicle fleet.

Moreover, in many cities around the world, even today prevails a mobility paradigm which is directly related to Social Status; it means that the way they are transported reveals (implicitly) about who they are and what role they play inside a society. In this scenario, a person who is transported through private vehicles, projects an image of success and fulfillment of professional goals, while a person who is carried in the public transportation systems, or some others such as cycling or walking, projects an image of poverty, stagnation and professional failure .

This, although it seems a topic or minor feature, represents a paradigm of mobility deeply embedded in many societies; moreover, it also represents the historical construction of a reality which, according to scientific evidence (environmental and urban design) is not only socially unfair, but unsustainable in the long term as well.

And this is a subject of high relevance if we take into account that, the classic paradigm of human transportation have historically developed a model with non-sustainable structures; it means, high levels of air pollution, noise, traffic jams and poor safety levels for non-motorized road-users. Unfortunately, this problems have a particular impact on the poorer segment of the population and which are specially vulnerable to road accidents or even violence inside public transportation vehicles.

Therefore, one of the main goals of this research is to determine how the social construction of an environmental awareness can be relevant to develop a new paradigm (world-view) of urban mobility, in order to combat unfair access to opportunities, social prejudices and the improvement of air quality conditions in many developing capitals, by the adoption of new customs, practices and legislation.

## 0.3 THE HISTORICAL MEANING OF VEHICLES

In the historical evolution of urban mobility, vehicles have represented a forward progress and the maintenance of social status, from the possession of animals for mobility like the horse, to the incorporation of new technologies with personal vehicles powered by internal combustion engine.

On this phenomenon, Seiler (2008)[3] thinks that this comes from the dominant

[3] Look for: Seiler, C. (2008). Republic of Drivers. A Cultural History of Automobility in America. E-book. ISBN: 9780226745657. 2009

and traditional discourse, where car promised freedom and comfort to people. Hence, the car is seen in many places as a mean of progress and social prestige, an obvious way to autonomy and success.

According to his assumption, this issue could be tracked in the recent history of countries like the United States; as Seiler stands, the Cold War questioned many of the basis of individuality and identity of “Americans”. At this point, the car usage was a key element to revive the ideas of autonomy, individual freedom, and the American character seen as a hero or a pioneer[4]. This particular interpretation of reality has spread (with their own respective variations) across the world in the recent decades.

Automobile discourse goes beyond "considering the driving act as a sensory experience... something deeply embedded. It means there is such a close relationship between the identity of the driver and the car (that one thing-person, the humanized automobile, or automobilized person) that, in the end, they are kinesthetically intertwined"[5] to the point that, somehow after a few years of presence of motorized vehicles in cities, our relationship with them has been naturalized to the point that they are part of our modern subjectivity.

However, this model of human transportation has not been homogenized worldwide; it means that it has not been established as an universal standard or paradigm of mobility. For instance, Münster, Germany stands (among many other places around the world) as what Derrida called "a productive but non-reproductive attempt". That is, a place where the original reference of what is a dominant trend has been disrupted by incorporating peripheral meanings from other different discourses. In this case, a mobility paradigm that incorporates forgotten elements from other times, such as riding bicycles or simply walking the streets .

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[4] Look for: Seiler, C. Republic of Drivers. A Cultural History of Automobility in America. P 35

[5] Thrift, N. (2004). Driving in the city. Theory, Culture and Society, 21, 41-59.

# PART I

# THEORETICAL FRAMEWORK

# 1.1 A WORLDVIEW DISCUSSION

In its discourse on the method, Rene Descartes considered that the process of knowledge construction is somehow very similar to a house being built[6]. In this process, there are two essential components: its foundation and its frame. These both characteristics furnish “the house” with basic stability, shape, and structure. A similar principle applies (according to his analogy) to scientific research: it needs ground assumptions and a framework of “principles” to provide ideas a basic argumentation stability, shape, and structure. This means that a researcher cannot objectively analyze what he[7] observes without some basic presuppositions about what these observations are, where they come from, and what principles of reason can be applied to them. In few words, even when from a philosophical point of view, reality may or may not be a perfectly clear and objective phenomenon, because the nature of perception is mostly subjective[8]; therefore each scientific position is necessarily derived from some initial presupposition which -undeniably- comes from the very deep beliefs in the mind of the researcher.

In that sense, a worldview[9] defines the self of the researcher. It sets the boundaries of who he is and how he thinks. But, furthermore, the worldview also defines everything that is not the researcher, it configures his entire reality, including the relationships that the researcher establishes with the human and non-human environments; in other words, it shapes his understanding of time-space and influences every norm and moral value[10]. So,

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[6] And that is why Descartes refers to knowledge in general as “the building of knowledge”. Look for: Descartes René. Discourse on the method. Part II. Gutemberg project. http://www.gutenberg.org/files/59/59-h/59-h.htm#part2

[7] For pragmatic purposes I used “he” instead of he & she at the same time, so this is not a gender implication; therefore, it must be understood ad a “he” & “she”.

[8] Philosophically speaking, this is one of the most classic topics of epistemology and, of course, there is long discussion over the term “reality”, yet, is is not a goal for this essay to arrogate this purpose.

[9] Also known as paradigms. Look for: Creswell W. John. Research Design. Qualitative, Quantitative, and mixed methods approaches. 4Th Ed. SAGE. United States. 2014

[10] Look for: Kraft, 1978, p. 4

every time a scientific starts a research, the main structure of his knowledge building is established by his own worldview, and it must be clearly defined and consistently structured in every possible research level.

For the purposes of this specific case, it will be presented and generally explained the environmental constructionist theory, so the present research may have a solid knowledge base, consistent with a specific worldview. This means that the entire human transportation phenomenon will be exposed and through the filter of this specific theory, uncovering a entire new dimension of what, until now, has been considered a merely technical issue[11]. However, even when the entire theory will be analyzed and exposed, Hannigan's constructionist theory of environmental problems will be the first and main referent for scientific investigation.

## 1.2 ENVIRONMENTAL CONSTRUCTIONISM

It is until the latest years that nature and environment have been attractive and also important to sociological thinking and theorizing. Specially because, even in the times of modern industrial societies[12] (supposedly a period characterized by a significant independence of humans on their resources) humans are more dependent than ever on natural environment to sustain their entire culture and civilization model.

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[11] Technical in the sense of two specific dimensions; the environmental dimension and in the urban planning dimension.

[12] What some researchers might post-modernity, but for the purposes of this research I will not go deep into this philosophical discussion

Therefore, environmental problems (such as overpopulation, pollution, resources depletion, environmental contamination, etc) has strongly called the sociological attention, on how they are affecting directly our ontological paradigms, such as the meaning of nature, humanity, development, future, and so on.

Dunlap considers contemporary societies as the latest stage of modernity (which is the era after the industrial revolution). This super-industrialized world have been built and defined by a discourse of natural resources exploitation and, in that sense, it has established and shaped for years a tight relationship between humans and nature[13] based on usage, appropriation and also, rejection.

Environmental sociological theory analyze and think this "rejection" phenomenon through the assumption of a paradox in our lives as social beings. People of modern societies have been raised with the idea that the criteria of evaluation of any level of development or sophistication, must implicate the rejection of what has been called as *natural life*. As a result, "our experience of nature is profoundly socialized"[14]. However this nature, although "socialized", still reflects and also shapes people's social world; therefore, this separation between social life and natural world happens and doesn't at the same time[15].

This complex and paradoxical relationship between men and nature, conducted by this dialectical dynamic of necessity and rejection, has jeopardized the access of resources for further generations; in terms of Dunlap itself "[…] the welfare of human societies was dependent on their biophysical environments"[16]. However, for Dunlap, this accelerated process of natural resources degradation is not only an ecological phenomenon and

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[13] Look for: Dunlap et al. 2002. P. 330

[14] Jerolmack, Colin. "Toward a Sociology of Nature." The Sociological Quarterly. P. 501

[15] And here is where the paradox unfolds, we talk about "a natural disconnection from what is natural". That is why, many concepts related with a civilized life or (moreover) with sophistication rejects harder the idea of a natural world.

[16] Dunlap et al. Sociological Theory and the Environment: Classical Foundations, Contemporary Insights. P. 336

issue, but also a matter of human behavior which, in the end, responds to a specific discourse or general “world-view” submission.

As a responsive attitude to this environmental degradation on the latest decades, new scientific generations, activists or everyone concerned with the conservation of nature, have encouraged society to think more about and get involved with the consequences of daily life actions and consumption habits (what has been called as “the modern lifestyle”); in other words, they intend to change the way people perceive this environmental depredation process, how to understand nature and what is their own relationship with it. This is certainly remarkable, not only because this environmental and scientific movements can modify our relationship as society with nature, but also because it represents a huge discourse shift and the progressive assumption of a new life paradigm.

Thinking in constructionist terms, this ecological activist phenomenon strengthen the idea that every paradigm is founded in existence of two different and linked levels of reality, one “objective” and other “subjective”. This sociological theory (first defended by Thomas in 1928), is founded on the very idea that “if men define situations as real, they are real in their consequences”[17]. Therefore, this “situations” are, most of all, social constructions of environmental issues, or, In different words, “a mechanism of internalization and externalization of environmental issues into people’s both subjective and objective reality”[18].

[17] Merton 2000. P. 196
[18] Vendula Hurníková. THE SOCIAL CONSTRUCTION OF ENVIRONMENTAL ISSUES: The case of Climate Change. P. 7

# 1.3 HANNIGAN'S CONSTUCTIONIST THEORY

Hannigan (1995) addresses this reality dilemma in the same way his predecessors did; it is, under the idea that environmental problems are essentially social constructions. It means that these problems are the result of their own process of legitimization and submission trough culture[19]. This is possible every time reality (with all its inherent problems) uncovers not exactly as an independent phenomenon capable of being objectively analyzed, but instead, as a cultural construction with a continuously process of maintenance by means of discourses, social participation, special iconography, scientific con-validation and institutional support. In short, according to Hannigan, when we talk about reality we talk about a complex process of analysis, discussion, acceptance, management and involvement of the whole society in order to achieve a "world understanding".

In his theory (construction of environmental problems) Hannigan agrees with the constructionist tradition on the existence of a paradoxical relationship between men and his environment[20]. Hannigan supports this assumption based on three important evidences: First, he considers that, even when humans are dependent upon their physical environment, its is only in a partial sense, because as long as humans have been emancipated by the division of labor[21], this dependence has significantly decreased. Second, technology has allowed humans to build their own artificial habitats (rather than to be constrained by it). Third, the base and structure of human communities goes far beyond the merely product of biologically elements and factors; it is, above all, made and determined by cultural factors; in Hannigan's words "an institutional structure rooted in custom and tradition"[22].

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[19] That is the social process of significant role of particular incidents or events which have the ability to make the environmental issues prominent.

[20] Needing it on the one hand, but rejecting and fighting against it on the other hand.

[21] Although there is a long tradition on this concept, I think Hannigan refers to the concept of division of labor employed by Adam Smith and later criticized by Karl Marx. Look for: Marx, K. (1977). Capital: A Critique of Political Economy, Volume 1. New York: Vintage Books, pp. 781-94.

[22] Hannigan J. *Environmental Sociology*. P. 17.

As a result of these three evidences, Hannigan concludes that human societies, in contrast to the rest of nature, rises into two different levels of organization: *the biotic and the cultural*.

Based on this first assumption, Hannigan's theory emerges with the novel statement that environmental problems are not an isolated result of natural phenomenon; strictly speaking, they exist because they are, at the same time, human creations; both in the sense of intellectual authorship, and in the sense of its subscription as real problems. In few words, it means that the submission and adoption of some specific ideas and concepts (both science as a daily life level)[23] defines what sociology called " the creation of social reality".

To support the thesis that nature is a social construction, Hannigan considers the following arguments: 1) there are no natural environments, 2) environmental problems become such when they receive social recognition and 3) cultural filter transforms everything natural into humanized.

*1. There are no natural environments*

Strictly speaking, there are no ecosystems undisturbed, in the sense that every known environment in the world have been (directly or indirectly) modified by human action; this is what Giddens[24] called " the end of nature". For instance, the impact of hunter-gatherers who inhabited the Amazon rain-forest changed significantly its ecosystem configuration, both for their hunting activities and for the practice of slash and fishing.

*2. Environmental problems become such when they receive social recognition*

Environmental problems are understood as such when they get social recognition. For instance, constructionists consider that the phenomenon of

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[23] I will explain further what do I mean by "some specific ideas and concepts".
[24] Look for: Giddens, Anthony. Affluence, poverty and the idea of a post-scarcity society. P2.

ozone levels reduction in the upper layers of the atmosphere (the so called “hole in the sky”) became an environmental problem only when it was socially accepted, first by the scientific community, then by the Media and eventually, recognized as a thereat by the whole population.

*3) Cultural filter transforms everything natural into humanized.*

Hannigan claims that knowledge of nature does not come from nature itself, its is mostly the result of social meanings provided by humans. For instance, in the “modern-industrialized” culture is commonly accepted that the origin of thunders remains in the accumulation of power in the clouds, while in other cultures these are understood as the result of the struggle between supernatural beings. Therefore, cultural filters transforms everything real into a social product and vice versa.

## 1.4 HOW AN ENVIRONMENTAL PROBLEM IS CONSTRUCTED

Hannigan compares the construction of environmental problems with the construction of social problems by considering their multiple similarities. Hannigan beliefs they both involve a strong social factor with further discussions in the public arena (and both with social consequences); however, the construction of environmental problems is distinguished from mere social problems construction in the sense that environmental problems are worth a continuous and strong scientific research base. In other words, on the one hand, social problems are (oftentimes) morally charged and involve state actors. On the other hand, although they are linked to human actors, environmental problems have a more imposing physical basis than social problems, which are more rooted in personal troubles and cultural processes that progressively become into public issues.

In describing how environmental problems are constructed, Hannigan divides the process of construction on three key-points: *1) animating the problem, 2) legitimating the problem, 3) demonstrating the problem*[25].

The process dedicated to draw attention or, as he calls it, the "claim making" step, is characterized by identifying the means and mechanisms by which an issue becomes public, calling the attention of the general audience and taking not only the discussion to the private sphere, but into public arena (at the level of decision making). However, this process "claim making" is not enough to determine, in sociological terms, what is becoming a social or environmental problem; It is necessary rigor in the contents of the "claim" to give legitimacy to the problem and not get lost in what might be called as "pseudo-problems".

The second moment of the construction of environmental problems has to do with the process of legitimization through expert opinion and eventual discussion by dedicated researchers to the subject matter. This applies especially to the discussion of its grip and possible legal or social settings. Finally, a third moment of this construction process appears with the demonstration of the problem by a direct support of expertise through scientific research and experimentation, so in the end, it is possible to talk about a communication bridge between two antagonistic positions; the political discourse (social reality), and scientific discourse (measurable reality).

## 1.5 KEY FACTORS INVOLVED

When we think about constructing a social and environmental problem, one of the first things we think and wonder has to do with the very nature of the problems; this is, what is being said about the problem? How is the problem

[25] It is very interesting that this process does not necessarily happen in a chronological way, it means that these are overlapping stages rather than sequential processes which together result in a public arena being built around a social and environmental problem.

being typified? What is the rhetoric of claims that make people see the problem as a problem? How can a specific rhetoric affect the review and consolidation of a claim as a real problem?

As a process, environmental problems require some development time from initial discovery to its resolution through the implementation of specific policies. This is the reason why, within the three recognizable moments in the construction of environmental problems, Hannigan considers the existence of six special principles (involved in the process of positioning and recognizing environmental problems) which can make the difference between success and failure in the consolidation as so. In other words, Hannigan believes these six principles can make the difference between having a real and recognized problem and just a merely pseudo-problem or another sensationalist note in the media.

These 6 principles are[26]:

*1- Scientific authority for and validation of claims*
*2- Existence of "popularizers" who can bridge environmentalism and science*
*3- Media attention in which the problem is 'framed' as novel and important*
*4- Dramatization of the problem in symbolic and visual terms*
*5- Economic incentives for taking positive action*
*6- Recruitment of an institutional sponsor who can ensure both legitimacy and continuity*

*Scientific authority for and validation of claims*

Regarding social problems related with public discussions and moral positions, the so called "hard sciences" have not so much to say or contribute, however, in the case of environmental problems "hard sciences" play a role of main importance; in fact, the whole history of the environmental movement has

[26] Hannigan, Environmental Sociology. Pp. 77

gone hand by hand with advances and scientific discoveries in fields as diverse as biology, chemistry, physics, meteorology and so on. In the words of Hannigan.

> Science may well be an 'unreliable friend' to the environmental movement as Yearley (1992) has suggested, but nevertheless it is virtually impossible for an environmental condition to be successfully transformed into a problem without a confirming body of data which comes from the physical or life sciences. This is especially so with the newer global environmental problems, whose very existence hinges on a novel scientific construction[27]

While it is true that science plays a major role in the recognition and social construction of environmental problems, it is also very important to notice that, just like any other human practice, science is not a infallible approach to reality. It is only another interpreting approach to the world, and it has been built as an endless sequence of successes and failures.

Therefore, this uncertainty and the lack of precision can lead to errors of judgment that make believe that an event is very serious, when in fact it is not; causing an irreparable impact on the credibility of a particular environmental claim.

> [...] scientists are reduced to offering estimates of probability that often vary widely from one to another. This lack of certainty allows claims-makers both within and outside science to assert that the situation is alarming, that the risk is too high and that society should do something about it[28]

For this reason, it is important to note that even if the scientific evidence represent a form of validity regarding environmental problems, scientific research is not a linear process and its discussions are never entirely overcome; therefore, there is always the possibility of error.

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[27] *Ibid. Pp. 77*
[28] Ibid. P. 97

*Existence of “popularizers”*

In parallel with scientific research, it is very important that all results can be grounded and subsequently delivered to the society (the final audience); for that reason it is necessary the existence disseminators or as Hannigan called them "Popularizers". In fact, many of them could even form part of the scientific community, however, their job won’t be the "hard inquiry" research, but a work of helping change the classic image of science as something diffuse, dark or inaccessible; in few words, building a bridge between academic and non academic people.

> It is crucial to have one or more scientific ‘popularizers who can transform what would otherwise remain a fascinating but esoteric piece of research into a proactive environmental claim[29].

It is also important be mentioned that the responsibility for building this bridge between science research and "the regular people" lies not only on scientists dedicated to "translate" the investigation into a more understandable language, but also politicians, journalists and publishers, among others. In the words of Hannigan

> Whatever their background, these popularisers assume the role of entrepreneurs, reframing and packaging claims so that they appeal to editors, journalists, political leaders and other opinion-makers[30].

The latter can be exemplified by the case of global warming, where political figures such as Al Gore, introduced permanently the issue on the political agenda and in everyday language through its worldwide dissemination conferences .[31]

Finally, just as that the job of dissemination may be shared between several

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[29] Ibid.

[30] Ibid. P. 77

[31] Look for Al Gore’s climate change conference in TED platform in 2009: https://www.youtube.com/watch?v=splKGWuErnM

actors from diverse backgrounds the material spread can be transmitted through different means such as magazines, books, radio and TV, among many others.

*Media attention in which the problem is 'framed' as novel and important*

According to Hannigan, one of the most crucial elements in strengthening environmental problems is the ability to disseminate them; this is absolutely relevant if we consider that a problem can have sound science and easy language so that everyone can understand, however, without a good media and dissemination campaigns, they will hardly remain in the collective imaginary and, as a result, they will be rapidly forgotten.

> [...] significant environmental problems fail to make the public agenda because they are not considered especially newsworthy. For example, in many Canadian cities lack of treatment of urban sewage is endemic but this has received scant coverage compared to other pollution problems. As the executive director of the Sierra Legal Defense Fund once pointed out, a volume of sewage equivalent to thirty-two oil-tankers the size of the Exxon Valdez is dumped each day into local rivers or bays, yet it is done out of the sight of the public with virtually no attention from the media (Westell 1994)[32]

Moreover, there are many cases in which political action and legal changes stands as a constant struggle for recognition through public claims; In this scenario, the media attention constitutes a very important way to capture public attention, and although the problems usually discussed mainly in the politic arena, the social pressure of a media scandal can definitely accelerate and push political action in a more efficient way.

*Dramatization of the problem in symbolic and visual terms*

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[32] Ibid.

It is very important that this element is not confused with media sensationalism; it is above all, about representing reality and (in that sense) facts in highly symbolic and visual terms. Therefore, the concept "dramatization" does not reefer directly to the word "drama" as an exacerbation, but as representation of what is really happening. This, as Hannigan states, provides a kind of cognitive short cut, compressing a complex argument into one that is easily comprehensible and ethically stimulating.

As an example, Hannigan considers the case of the ozone depletion, which was not a solid candidate for widespread public concern until the decline in concentration was graphically depicted as a hole over the Antarctic[33].

Moreover, symbolic representation could also work as a way to connect in a simpler and more profound manner with the audience, because the messages represented in simple images usually stay longer in the collective memory. At the same time, this representation through symbols gives an even clearer identity to the environmental problem. In the words of Hannigan

> Rhetorical strategies are important here in creating distinctive labels for emerging problems as well as devising symbolic codes that can be attached to a claim in order to confer a distinctive identity[34]

*Economic incentives for taking positive action*

Generally with the support and acceptance from the audience through proper research, outreach and symbolic representation (once the problem has been recognized and adopted as a common cause), it becomes possible to receive support through resources for its execution and implementation. However, it is very important to consider that every support and economic incentive may affect indirectly other different groups, provoking sharp opposition.

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[33] Look for: Hannigan, Environmental Sociology. Pp. 78
[34] Environmental Sociology. Pp. 76

It is also very important to note that finding resources and economic incentives stands as a constant struggle, specially because environmental problems are not always seen by governments as a priority; for this reason, economic crises often bring cut and definitive closure of budgets for the mitigation or solution of these problems. Hannigan is reiterative about it through many examples, most notably through the economic recession on the 80's.

> during the late 1980s, Greenpeace and Friends of the Earth had good access to the national media in Britain, but they subsequently experienced some difficulty as the threat to the environment gave way to other issues such as the economic recession[35]

Finally, Hannigan warns on the error of considering that the existence of financial resources to fund research and solutions to environmental problems ensures the success of projects and, in the end, the whole issue of building and legitimizing environmental problems could be reduced only to the economic aspect.

In that sense, Hannigan says categorically that, without the simultaneous existence of some of the other 5 principles, recognition and solution of environmental problems can hardly occur, even if the financial resources are available. Thereby, the available capital (itself) is not a factor of change in the process of legitimizing environmental problems, unless it is backed simultaneously by the other principles.

*Recruitment of institutional support*

Finally for an environmental problem, to be fully built and successfully developed, there must be an institutional sponsor attesting to its legitimacy

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[35] Ibid. P. 85

and helping to ensure its continuity. This is especially important since the positioning of an environmental issue on the political agenda shortens the way to its legislation. Internationally, this can be observed by the important role played between States and NGOs, influencing United Nations international statements, agreements and rulings.

This principle calls strongly Hannigan's attention in the sense that support and validation of official institutions can take the environmental issue to a new level of action. This is because an active government could be the visible head who organizes, funds and coordinates the various programs and social groups in a locality. In the words of Hannigan

> and institutional contacts gave them strong voices within the scientific establishment and good access to Federal and private sources of funding, which supported both their scientific and policy efforts[36].

However, as happens with the economic issue, institutional response and action can not be (by itself) the only factor of change of environmental problems; because without the simultaneous support of the other principles, institutional actions run the risk of becoming unilateral decision, where social actors are relegated to mere passive and incidental spectators.

## 1.6 FIRST THEORETICAL CONCLUSIONS

*Epistemic communities*

When we think about constructionist theory of environmental problems[37], it is important to be careful and not make the error of considering that its unique

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[36] Ibid. P. 128
[37] Not only Hannigan's but the whole theory in general.

goal is only the assignment of a certain environmental problem to a specific population; it means that its importance would be evaluated only by terms of its ability to uncover the mechanisms of operation and then positioning a socio-environmental problem or environmental issue[38].

In fact, the highest value of the constructionist theory has to do with the progressive and historical construction of access to regular population to trustful and reliable information (scientifically validated) about the conditions of their own resources. In that sense, it also has to do with how it (subsequently and progressively) influence people to subscribe into a different epistemological framework[39] and, in the end, how people can become from passive[40] into active actors, regarding further State decisions; that is why, in Hannigan's opinion, epistemic communities have such a great value to the construction of environmental problems, because "they are not only bounded together by a technical expertise but they also share a number of causal and principled beliefs"[41].

In the end, when assessing the importance of the constructionist theory of environmental problems, it is important to keep in mind that above all, one of its main objectives is to provide a sufficiently robust/accessible ontological and epistemological framework (simultaneously), so that anyone can subscribe to it. This is certainly a historical process, based on epistemic communities, that seek the creation of an informed collective awareness about phenomenon that someday may jeopardize the continuity of man as specie on the planet and, in that sense, that could possibly encourage deep changes in attitudes, customs, regulations and laws.

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[38] It means, its treatment only as a market-research tool, and not as a whole cultural, epistemological, scientific and historical phenomenon; which I consider is very unfair with the theory.

[39] A worldview compatible with the resources and its inherent problems

[40] Never taken into account (historically).

[41] Hannigan, Environmental Sociology. Pp. 102

*There are some risks related to social construction of environmental problems.*

As we try to understand the nature of the constructionist theory of environmental problems, we find that is not only important to pay attention on the social construction process and the eventual adoption or rejection of a problem, but also to what is done and what solutions are implemented when the problem arises. In other words, we find that the constructionist theory not only acts as a "world-view" with which it is possible to understand certain phenomenon, but at the same time, it works in parallel with researchers as a treatment tool for those same problems. As Best noted

> Constructionism is not only helpful as a theoretical stance but also that it can be useful as an analytic tool, studying social problems from a social constructionist perspective: the claims themselves; the claims-makers; and the claims-making process[42].

As a research tool, constructionist theory of environmental problems is not safe from risks derived from misunderstandings, misinterpretations and possible efforts to take personal advantage of it. According to Hannigan, there are some cases in which informed societies and active epistemic communities can be used in a clearly negative way by decision makers, who look for scientific advice not because of their expertise, reputation or credibility, but based on a desire to avoid responsibility. In such a situation, decision makers look for individuals who are able to provide authoritative advice in order to pin the blame for any policy failure[43].

*Avoiding misunderstandings.*

Finally, another common misunderstanding related to the theory is to assume that it rejects the existence of a factual reality, thereby offering a radical

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[42] Best, J. (1987) 'Rhetoric in claims-making', Social Problems, 34(2): 101–21.
[43] Look for: Hannigan, Environmental Sociology. Pp. 102

idealist stance in epistemological terms. However, Hannigan opposes this

view of the theory arguing that this inaccuracy is due to a confusion of terms, linking the constructionist with the most radical version of the constructivist theory.

> Only a 'false reductionism' […] can construe constructionist accounts as claiming that environmental risks do not exist or that natural reality plays no identifiable role in producing knowledge about these risks. What constructionists are actually saying is that we need to look more closely at the social, political and cultural processes by which certain environmental conditions are defined as unacceptably risky, and therefore, contributory to the creation of a perceived 'state of crisis'[44]

This is a very important objection by Hannigan because, even when the constructionist theory have some roots in common with the constructivist theory[45], the last one refers to a psychological (cognitive) processes and structures at an individual level[46]. In other words, how we (humans) perceive the world as individuals; while constructionist has been very clear since its origins that the way we perceive the world around us is socially and not individually constructed; but most important, in almost all of the cases, it happens without denying a physical and factual reality[47].

This is why Hannigan is very clear when he claims that since the origins of the theory, constructionist authors more or less agree there is a factual reality which draws the basis for the construction of environmental problems (resources depredation, water and air pollution, chemical disposal, etc)[48].

Moreover, the great goal of constructing an environmental problem and

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[44] Hannigan, Environmental Sociology. Pp. 29.
[45] Mostly that reality is constructed (completely or partially).
[46] In opposition to the constructionist theory, which considers (over all) this is a social phenomenon.
[47] Contrary to the belief of the mos radical face of the constructivist theory.
[48] Look for: "A link between two discourses" P. 8.

understanding it is, in the end, the awareness and transformation of practices, customs and policies involved on direct and negative effects in the reality which is, at the same time, the base as evidence to any physical diagnosis of our resources[49].

[49] In which case it is what enables our existence as a species on the planet.

# PART II

# METHODOLOGICAL DESIGN

# 2.1 HYPOTHESIS

Hannigan believes that the construction of environmental problems can lead, in the best scenario, to the creation of an "environmental consciousness" or, in his own words to an “ecological awareness”[50], which can be eventually reflected in concrete changes on the customs, culture and legislation[51]; However, the author wont go deeper into the idea that the very transition to concrete changes (talked back lines) is essentially, just like the development of environmental problems, a social construction. Therefore, the hypothesis with which this research starts is just this little corollary or appendix on Hannigan’s theory.

In that sense, one of the must important goals for this research is to demonstrate how this assumption is truth or false.

# 2.2 PRIMARY OBJECTIVE

*ANALYSIS OF SOCIAL CONSTRUCTION PROCESS OF ALTERNATIVE SOLUTIONS FOR URBAN MOBILITY: THE CASE OF MÜNSTER, GERMANY.*

To proof and validate this research hypothesis, it will be necessary to deconstruct and eventually reconstruct the dynamics and history of development of the transportation paradigm in Münster. It is expected that this strategy will allow a better comprehension of the evolution and historical development of how specific strategies (from the government as well as from the civil society) have encouraged and Involved stakeholders into a different paradigm of urban transportation (ie, a multi-modal mobility system).

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[50] Look for: Hannigan. Environmental Sociology. Pp. 63.
[51] This has been already explained in the theoretical framework of the present research.

It is expected that by understanding the causal relations and the process of narrative reconstruction of the struggles faced and the strategies used for such settlement, it will be possible to adapt or even create new strategies and recommendations to facilitate a similar transition to this specific paradigm of mobility in developing cities.

## 2.3 METHODOLOGY

For the success of this research, it is imperative to understand and analyze the complete Münster's transportation phenomenon in its own context, historical process and complexity. This attempts to be achieved through Hannigan's constructionist and Derrida’s deconstructionist theory as a research base; it means that the entire process of narrative about Münster’s infrastructure, mobility culture and environmental awareness history will be deconstructed and eventually reconstructed, but starting from a “soft constructionist” world view base.

By the achievement of an adequate and consistent comprehension of the current situation of Münster's urban mobility, it will be possible not only an analytic perspective of the place, which combines different approaches that can be well considered as multidisciplinary, but also to certain recommendations for the improvement of urban mobility in specific developing regions.

# 2.4 THE METHODOLOGIC ORDER

*Deconstruction theory as a methodological tool.*

It's really impossible to explain what deconstruction is on simple terms. One should notice that it is not a method that can be applied through a series of steps (in the style of a recipe or a laboratory procedure) is rather a specific position on the reality and of what can be said about it. For that reason, it is not possible to speak about deconstruction as a direct synonym of destruction. By deconstruction, we speak rather of an "orderly dismantlement" or a kind of disassemble of whose remnants can be further reconstructed reality, but under new principles or significant basis[52].

In short, we refer to a close lecture of the basis and principles of reality to give them a different meaning from what appeared to be telling us. This is why, deconstruction is shown as a kind of "disassemble" of a single lecture prior to a further "reconstruction" or “reassemble” with the addition of new possible interpretations .

Now, thinking about this or any other research project, one of the first complications that we face as we approach to Derrida’s theory, is the fact that, originally, this was intended to be an ontological study (more specifically a study about Martin Heidegger’s Being and Time); that is, the theory was originally conceived in a purely theoretical sense (a metaphysics theory), whereas here we seek to find more practical applications. All this opens the question of: how to achieve that?

Derrida tells us that there is a sort of pre-understanding of being and reality that in one way or another, determines what the world is and how we behave inside it. Thus, the central motif of deconstructing metaphysics is to open a

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[52] Look for: Peretti. “La estrategia general de la deconstrucción” (125-131) & “La doble práctica de lectura y escritura” (149-165). 1989

new approach to the most radical question that can be done by human thought, and that is the question about the sense of being. In the end, Derrida concludes this dilemma (in his fight against logocentrism) with the possibility of multiple lectures of one same phenomenon[53].

However, despite Derrida's position about his theory, he certainly does not close the possibility that this procedure can eventually be used as an analytic tool to study and understand in new ways specific phenomenon on reality. As Balkin stands, deconstruction theory can be very useful to understand how a text, a historical tradition or a social practice can develop privileges and become a general and dominant norm. In other words, he considers that through deconstruction as an analytic tool, it is possible to understand the relations between dominant and undervalued discourses.

> One can deconstruct a privileging in several different ways. For example, one can explore how the reasons for privileging A over B also apply to B, or how the reasons for B's subordinate status apply to A in unexpected ways. One may also consider how A depends upon B, or is actually a special case of B. The goal of these exercises is to achieve a new understanding of the relationship between A and B, which, to be sure, is always subject to further deconstruction[54]

This is very important because in Balkin's opinion, some discourses privilege certain features of social life, traditions or cultural manifestations by suppressing or deemphasizing others. In that sense, deconstructive analyses search for what has been deemphasized, overlooked, or suppressed in a particular way of thinking; offering a new possible interpretation of how reality is or could be.

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[53] In the specific case of Derrida, he refers to the concept of being, but what this research attempts is to use that research structure in order to understand a specific phenomenon in reality.

[54] Balkin, J.M., "Deconstructive Practice and Legal Theory,". P 2of

*Deconstruction theory applied as a methodological tool to analyze urban mobility*

In the case of mobility and how it develops in various cities around the world, this research starts from the assumption that deconstruction theory can offer, at least tangentially, a new lecture and, therefore, a novel interpretation on the process of creating an entire different paradigm of mobility in a city (in this case, Münster). In that sense, while the constructionist theory of Hannigan will be the filter or ground theory from which the development process of this paradigm will be analyzed and interpreted; the method or strategy for achieving this objective will be the deconstruction theory offered by Derrida.

In this regard it is worth taking into consideration that one of the most valuable conclusions about Derrida's work[55], is that inside reality there is not an original meaning or ultimate truth of which we should re-appropriate, therefore, more lectures and interpretations are possible and valid as well.

## 2.5 THE STRATEGY

In order to deconstruct and eventually understand the process of creating the mobility paradigm in Münster, Germany, it is necessary to analyze the historical process in its different dimensions, in the case of this research, the historic line of events will be dislocated according to the six basic principles[56] for the construction of environmental problems proposed by Hannigan.

Once separated the information in these 6 sets, it will be possible to analyze, process and evaluate the changes and decisions that helped to consolidate this specific paradigm of mobility through history. In other words, by this

[55] Which, at the same time, represents much of the post-modernity thinking and feeling
[56] The six principles were described in the previous chapter.

deconstruction analysis and measurement it is expected to emerge a new possible lecture of the mobility phenomenon in Münster that may be compatible with further strategies to improve mobility systems on cities in and under development. The figure #1 illustrates the strategy proposed.

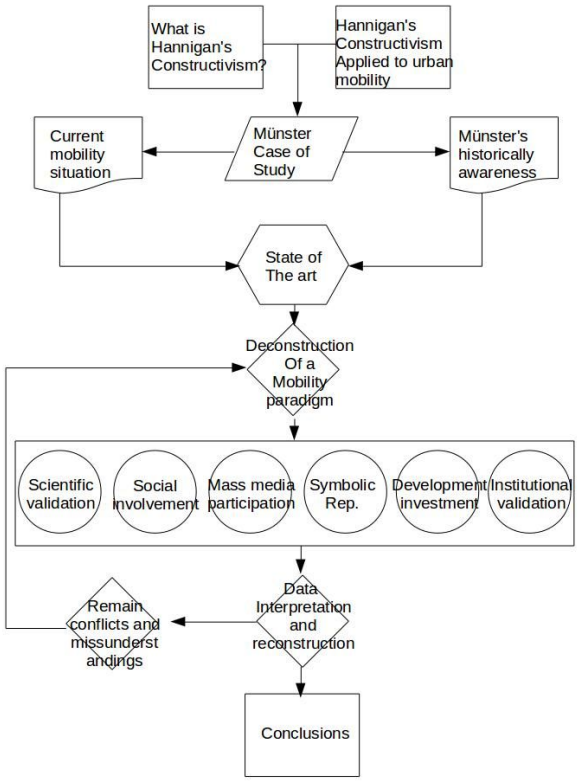


*Figure 1.*
*This figure shows the transition to a new interpretation of urban mobility in Münster through the deconstruction of their own history* [57]

It is also very important to point out that the deconstruction process does not reefer to a chronological dislocation of the historical events, but to a selective disassembling according to the 6 principles that define the construction of environmental problems. Once this process is completed, the different parts of the history will be putted back together according to these principles, so a different lecture and therefore, interpretation of the same phenomenon, will be possible.

[57] The narrative information will be obtained by interviews and bibliographic research. Then it will be dislocated and processed through the 6 different basic principles of the construction of environmental problems (by Hannigan).

*Assessing social construction*

Social constructions are extremely complex events, so they become really hard to analyze and evaluated by traditional “hard sciences” methods. Of course, the result of this special status is that researchers might find several difficulties in the process of studying, comprehending and linking this social events with concrete environmental theories and possible further solutions. That is why it is very important to establish a clear strategy that allows a researcher to have an ordered description and view of the historical and logistical process of any possible social phenomenon, which, in this case is the social construction of environmental problems related to urban mobility.

For such a major task, it is very important to understand accurately Münster’s mobility paradigm and how was it built.

## 2.6 MÜNSTER’S MOBILITY PARADIGM

*Münster overview (a cycling story)*

Münster is a city located in North Rhine-Westphalia, Germany. With a population of over 293,000 inhabitants, according to the 2012 census[58]; is home to the administrative district of the same name. Münster is geographically located between the cities of Dortmund and Osnabrück in the center of the Münsterland (a region characterized by its scattered villages, isolated farms and ecological reserves).

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[58] Look for: Bevölkerung im Regierungsbezirk Münster. Information un Technik Nordrhein-Westfalen. Data available at http://www.it.nrw.de/statistik/a/daten/amtlichebevoelkerungszahlen/rp5_juni12.html

For official registers, Münster appears as one of the largest cities in territory in Germany; however, an important part of Münster is dedicated to agriculture, so its population density (approximately 980 inhabitants per km²) is lower, compared with other main German cities. Thus, as it can be seen in the figure # 2, virtually the entire population of the region is choreographically grouped in the center of the city.


*Figure 2.*
*Münsterland map in rose color with the main urban area colored in blue. Also relevant statistical information*[59]

For some time now, Münster has been defined as a university city with about 50,000 undergraduates and more than 30,000 students enrolled in 92 different colleges and institutes as well ; however, even when Münster stands out for its huge number of university students, also it has been characterized in recent decades by being a highly inclusive space.

Nowadays Münster holds the title Germany' s cycling capital. It also was awarded as the most livable city in the world in 2004[60] and a "green European capital"[61]; but it has not been always like that. After the Second World War 90% of Münster was completely destroyed; a lack of financial solvency, industrial and urban infrastructure, and the political atmosphere of uncertainty, triggered a major crisis in almost every possible aspect in the city (economic, politic, social), driving all its inhabitants to a scenario of fear and

[59] Extracted from Google Maps, 5km https://goo.gl/maps/U6Yxq.
[60] Look for: http://www.muenster.de/en/most_liveable_city.php
[61] Look for: http://www.muenster.de/stadt/greencapital/index_en.html

zero growth not only in the North Rhine Westphalia region, but in the entire country as well.

As one might imagine, at the very early stages of the reconstruction, Münster (as the whole Country) had almost no motorized mobility and, neither a great number of public transport vehicles[62]; for that reason, bicycles played a main roll as a mobility option for almost all citizens. They represented a very intelligent bet at the time; not very hard to repair[63], relatively cheap and, most of all, they were non fuel dependent[64].

However it was a major surprise for all those who witnessed and remember the reconstruction history that, only few months later after the German capitulation, the city of Münster already had a water supply system, drainage, basic railway infrastructure and some well-defined streets that connected different parts of the emerging territory. From that point (between the 50' s and 60's decade), political decision makers observed that once the motorized vehicles started to arrive into the city and the fleet started to grew rapidly, they had to confront the increasing demand for road space between these two different land users, bicycle on the one hand and car owners on the other. The solution was the creation of new and long term policies which included separate bike routes, so that the multitude of cyclists were no longer conflicted with the growing automobile traffic.

Regarding bicycle infrastructure, Muenster's can be divided into two different networks or stages. On the one hand there is the so-called primary network, which is a system of continuously spread ways, running and crossing the main streets and traffic axes. It must be said that, even when its construction was started in 1948, it has only been completed recently[65].

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[62] Such as tram system, u-bahn or buses.

[63] This was very important in the middle of a crisis with almost economic power, no hand-tools and no mechanical supplies.

[64] Of course, it is important to say that Münster was not the only city who adopted bicycles as their main transport options at this early stage of the national reconstruction. It was rather an observable phenomenon the whole European territory devastated by war.

[65] Look for: Georg Doehn. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle Infrastructure. Pp. 2.

This primary network has been used to link or connect the city of Münster with the near villages, specially taking into account that on the early stages of the reconstruction, this network was vital to supply Münster through the local farms. The rest of the primary network goes around the city center and connects all the important locations where inhabitants travels on a daily basis. Figure #3 shows the primary network marked with red color.

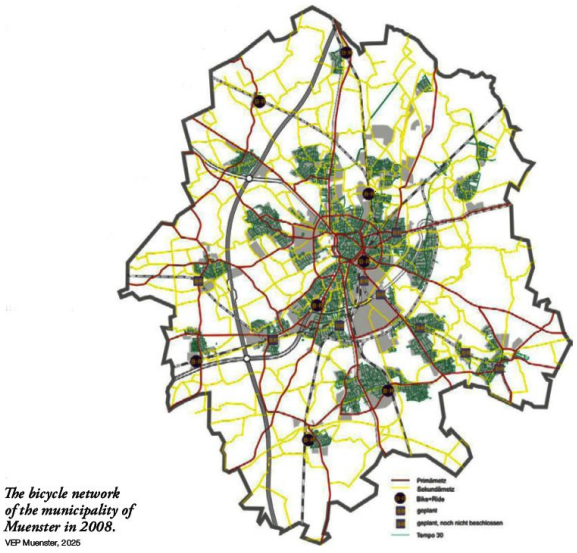


*Figure 3.*
*The main bicycle network in the municipality of Münster colored in red. Image taken in 2008*[66]

In addition, it must be said that almost the entire project was made on the late 80's, accompanied with national and local programs for development and helped by the long term vision policies who created it on the first instance.

The secondary network was a complementary project to improve the primary network with more connections, it is a group of cycle tracks which include traffic-calming in residential areas, linkages of lacks in the prevailing network, cycle paths and connections in parks and pedestrian areas[67]. In short, the main purpose of this secondary network is to offer shortcuts to the regular users of the primary network, so the travels can be better, safer and faster.

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[66] Image of the Münster's bicycling network in 2008. Taken and edited from: Georg Doehn. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle Infrastructure. Pp. 2.

[67] Look for: Georg Doehn. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle Infrastructure. Pp. 3

On the figure #4, it can be observed the secondary network marked with dark blue and black color.

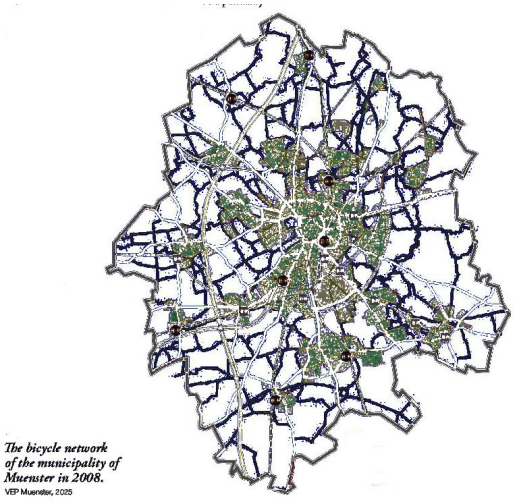


*Figure 4.*
*The secondary bicycle network in the municipality of Münster colored in black. Image taken in 2008* [68]

Nowadays bicycle paths in Münster cover more than 460 km of roads, complemented by a cycle friendly environment which is so near to a “life-style”, that has become unique in the whole country; involving almost all social actors and converting them as promoters as well.

However, every time we try to explain how this paradigm of mobility was developed in Münster, it becomes more and more important to notice how to the 80’s decade an important shift on mobility discussion happened; instead of being only linked to the idea of urban and economic growth, the decision makers moved the discussion about city development to the field of issues concerning to the preservation of people’s quality of life and environment (clearly very modernist and progressive postures at the time)[69].

As a consequence, campaigns to promote the usage of the bicycle and walk paths where strengthened.

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[68] Image of the Münster’s bicycling network in 2008. Taken and edited from: Georg Doehn. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle Infrastructure. Pp. 2.

[69] Specially if we take into account that the strong international movements claiming for environmental attention become of public domain only on the late 60’s.

As a result, more than 30 years later, Münster holds one of the greatest averages of bicycle usage and the lowest number of deaths due to heart attacks compared with any other German city. There is a huge fleet of almost 500.000 bicycles that can be found in the city, holding about twice as many bicycles as residents (almost 300.000)[70]. Besides the infrastructure, the city is also leader in commerce and services associated with this transportation system[71].

| Rang | Ortsname | Gesamt-bewertung | zum Vergleich: Rang 2012 |
|---|---|---|---|
| 1 | **Münster** | **2,50** | 1 von 38 |
| 2 | **Karlsruhe** | **3,21** | 3 von 38 |
| 3 | **Freiburg im Breisgau** | **3,32** | 2 von 38 |
| 4 | Hannover | 3,40 | 6 von 38 |
| 5 | Bremen | 3,51 | 7 von 38 |
| 6 | Kiel | 3,54 | 4 von 38 |
| 7 | Oberhausen | 3,58 | 5 von 38 |
| 8 | Frankfurt am Main | 3,61 | 9 von 38 |
| 9 | Leipzig | 3,61 | 10 von 38 |
| 10 | Rostock | 3,63 | 8 von 38 |
| 11 | Bielefeld | 3,68 | 12 von 38 |
| 12 | München | 3,70 | 11 von 38 |
| 13 | Mainz | 3,71 | 17 von 42 |
| 14 | Chemnitz | 3,75 | 20 von 38 |
| 15 | Braunschweig | 3,76 | 19 von 38 |
| 16 | Aachen | 3,86 | 13 von 38 |
| 17 | Gelsenkirchen | 3,88 | 18 von 38 |
| 18 | Bonn | 3,90 | 14 von 38 |
| 19 | Mannheim | 3,92 | 23 von 38 |
| 20 | Dresden | 3,92 | 21 von 38 |
| 21 | Magdeburg | 3,93 | 16 von 38 |
| 22 | Augsburg | 3,95 | 32 von 38 |
| 23 | Essen | 4,00 | 22 von 38 |
| 24 | Lübeck | 4,00 | 25 von 38 |
| 25 | Dortmund | 4,00 | 15 von 38 |
| 26 | Nürnberg | 4,01 | 17 von 38 |
| 27 | Erfurt | 4,02 | 26 von 38 |
| 28 | Stuttgart | 4,02 | 30 von 38 |
| 29 | Duisburg | 4,05 | 29 von 38 |
| 30 | Berlin | 4,07 | 24 von 38 |
| 31 | Krefeld | 4,13 | 28 von 38 |
| 32 | Wuppertal | 4,20 | 38 von 38 |
| 33 | Halle (Saale) | 4,21 | 27 von 38 |
| 34 | Düsseldorf | 4,27 | 33 von 38 |
| 35 | Hamburg | 4,28 | 34 von 38 |
| 36 | Köln | 4,29 | 31 von 38 |
| 37 | Bochum | 4,38 | 35 von 38 |
| 38 | Mönchengladbach | 4,46 | 36 von 38 |
| 39 | Wiesbaden | 4,55 | 37 von 38 |

*Figure 6.*
*Ranking of Appreciation 2014th*
*The three winners were awarded the ADFC bicycle climate test in 2014 with a certificate in the category "Leader"*[72]

*Münster: more than just bicycles.*

A common mistake at the time of thinking about Münster or any other successful model of urban mobility, is to consider only one mean of

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[70] Look for: Georg Doehn. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle Infrastructure. Pp. 4

[71] Look for: Georg Dohen. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Infrastructure.

[72] bundesministerium für verkehr und digitale infrastruktur. Städteranking ADFC-Fahrradklimatest 2014. P. 1

transportation as the entire answer to these issues. In the case of Münster, its huge bicycle average and usage takes away the lights from its efficient public transport system.

Besides cycling, bus transportation also represents an important option for urban mobility and also stands as a key element in the city's environmental and climate protection program[73].

The main goal of this program is to decrease the city's greenhouse gas emissions 40 percent by 2020, this a very ambitious project based on multidisciplinary approaches, which involves the fields of building, power generation, renewable energy, electricity saving and traffic management, in what attempts to be a coordinated work of different municipal offices. This means that, not only businesses can obtain support from the "Münster Climate Alliance"[74], but also citizens are encouraged (by governmental programs) to actively participate by committing themselves in what has been called the "Citizens pact"[75].

All these actions and more than 30 years of long term vision policies, have paid good dividends; when comparing Münster with other German cities, it becomes obvious that the Westphalia city have developed a preference for environmentally friendly systems of mobility (mostly bicycles) with a significant impact on the growth of the sustainable transport means; in what might be also understood as a mobility paradigm shifting.

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[73] Derived from the original "Germany's National Climate Protection Program". Available on: http://www.caneurope.org/resources/archive/external-documents/1102-germany-s-national-climate-protection-programme/file.

[74] Look for: Muenster's climate alliance http://www.klimabuendnis.org/muenster.0.html

[75] Look for: Muenster's "Citizens' Pact for Climate Protection". http://www.presseservice.de/data.cfm/static/750072.html

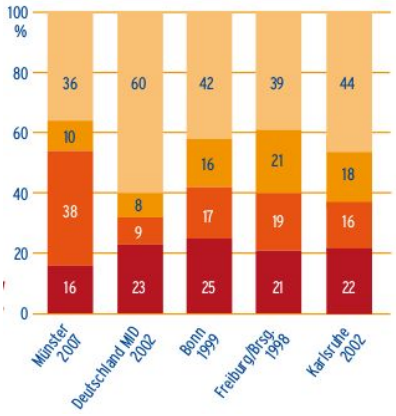


*Figure 7.*
*Comparative figure of means transportation usage in 1998, 1999, 2002 and 2007. The red color represents pedestrians, orange bicycles, yellow public transportation systems and beige private automobiles*[76].

The next step of this research paper is to offer a new lecture on the history of a successful case like Münster from the constructionist theory and then disassemble their 6 principles in such a way that they can be useful for cases that still require concrete strategies to improve their own mobility systems.

## 2.7 DISASSEMBLING & ASSEMBLING INDICATORS

Through a sort of interviews and bibliographic research it is expected to disassemble and understand, in a tangible way, the real impact of the 6 different principles that Hannigan considers as essentials to socially validate an environmental problem. However, before this is done, it becomes relevant to understand how are these principles applied and what roll are they playing nowadays in Münster.

*Environmental studies*

As it was previously settled, scientific studies and validation represent a key element in the process of constructing and legitimating environmental

[76] Fromberg, Andrea. Gwiasda, Peter. Planungsbüro VIA eG. Fahrradhauptstadt Münster. Alle fahren Rad: gestern, heute, morgen. P. 17

problems. For the purposes of this research the questions about how environmental studies were and still are relevant to this phenomenon, they will be focused about specific studies on what the Münster's cycling plan was based; whether local, national or international studies.

*Divulgation campaigns*

One of the most important factors that can determine the success of this specific environmental problem construction is the dissemination. This could be done through different sort of campaigns; from "scientific-divulgation", local publications and basic school approaches, to mass media direct campaigns. In the end, the main goal is to change the classic image of environmental and transportation scientific data as something diffuse, dark or inaccessible by building a bridge between academic and non academic people[77].

*Informative campaigns*

The informative campaigns can be the result of independent efforts or the direct co-working with official divulgation campaigns through concrete dramatization strategies; for example, for the case of Münster, could be the development of special iconography that might significantly help to identify the problem of urban mobility in any circumstance or daily life scenario. Therefore, this kind of strategies might be developed, organized and sponsored by many of the different actors and that is why it is so relevant to track and identify them.

*Incentives for campaigns and co-working*

Here is not only important to study and analyze the sponsorship programs that support the different official and unofficial campaigns. By presenting and studying their own process of development it could be discovered another

[77] Look for: Hannigan, Environmental Sociology. Pp. 77

important phenomenon described by Hannigan. This is that every support and economic incentive may affect indirectly different groups who also claim for support at the same time, provoking sharp opposition.

*Co-working*

Once there is an institutional response on the popular claims or (if there is not clear popular claims) on the scientific evidence of environmental problems, it is very important to track and understand the different strategies to sponsor, collaborate and institutionally support the different public and private campaigns.

According to Hannigan, this could be the key factor to link all the independent efforts into one unique and strong paradigm shifting movement; therefore, for the case of Münster which appears to be a successful case, it is extremely important this is fully understood.

*Sanction campaigns*

A further step for the consolidation of an alternative urban mobility paradigm is the so called “negative campaigns”. These are not deeply addressed by Hannigan but commonly represent a second instance on the construction of social problems recognition and validation. Once the civil campaigns have served their purpose, the new legislation must shield the transition process through penalties to those who violate the new laws. Of course, this is a very problematic topic, because a change in the legislation without an adequate process of legitimization, recognition and support from civil society, may risks lack of credibility and eventually generate a phenomenon of rejection and nonconformity.

To fully understand the roll played and the influence of these 6 principles, the next questions above will be asked to the different actors, mostly responsibles for the main principles that Hannigan considers necessary to socially construct and validate an environmental problem.

The results will be processed, organized and exposed to rate and evaluate how was developed a case considered as successful and, tangentially, acquire specific tools that might facilitate the analysis and development recommendations for areas under development.

Table of possible questions to ask on the interview sessions

| Topics | Questions |
|---|---|
| Environmental studies (ES) | - Was the existence of environmental studies on air pollution by cars what triggered the interest and eventual execution of promotional programs, outreach and legislation regarding the use of alternative transport?<br>- If so, were the studies focused to the case of Munster, national or international? |
| Incentives for research (IfR) | - Were there any economic incentives for the development of environmental research for the specific case of Münster?<br>- Was the concern for city growth and increasing levels of air pollutants which caused the environmental research funding? |
| Divulgation campaigns (DC) | - Have there been any campaigns to promote the use of bicycles and public transport in the city?<br>- Now that the city has high rates of bicycle and public transport usage, are they still carried out promotional campaigns and information dissemination?<br>- Was there a tangible reflection between creating and promoting information campaigns and the increase on the use of public and alternative transport?<br>- What means were used to disseminate the message?<br>- Were these campaigns well accepted since its inception?<br>- Do you think the dissemination and promotion campaigns had immediate results or were subject to criticism from private automobile users? |
| Incentives for campaigns and co-working (IfC&CW) | - Information campaigns and dissemination have been financed only by the state or private actors have been involved in them as well?<br>- Are there only official campaigns for promotion or private institutions have done also their own?<br>- Is there a dialogue, work and teamwork promotion between private actors and government offices to encourage public transport and cycling? |
| Informative campaigns (IC) | - Have you worked on a specific iconography to help people to relate to Münster with an environment friendly city or cyclists?<br>- Have you worked on a specific iconography to help people to relate the usage of public transport and cycling as part of the solution to the problem of air pollution in cities?<br>- Have you worked on a specific iconography to help people to relate the usage of public transport, cycling and walking paths to the idea of a social principle, such as cohesion and security on transit freedom? |
| Co-working (CW) | - The different government offices involved directly and indirectly with the issue of mobility, environmental problems, health and transport culture maintain a common agenda or they work independently?<br>- Is there a program of cooperation and co-working with national and international offices to improve the current structure of mobility in Münster? (Or on the contrary, to help improve mobility in other cities in Germany and the world) |

*Figure 8.*
*Table of possible questions to ask on the interview sessions*

# 2.8 DECONSTRUCTION ELEMENTS FOR THE MÜNSTER CASE

To organize correctly the paradigm shift in Münster, it will be necessary to separate the subject into different labels. Each label will contain a main topic or a Hannigan's principle for the creation of environmental problems. They will represent guide-lines that will be discussed in the interviews applied to the people responsible for each of the "actor" boxes, so it will be possible to finally dislocate or deconstruct the entire process for its further rearrange. By following this strategy, it might be possible to avoid significantly irrelevant information and, at the same time, to speed up the development process of interviewing the various actors and organizing the answer's information in the best possible manner.

For every label it will be tracked and processed information that might allow the current research to classify, evaluate and rate the 6 principles of construction of an environmental problem and its further attempt to shift the old paradigm of mobility in a location considered as successful.

This will be achieved by two simultaneous actions; on the one hand by a bibliographic research about Münster's mobility model, infrastructure, mobility culture and development history and, on the other hand, by on a sort of interviews applied to the most relevant actors in the construction process. Therefore, there will be available information both quantitative and qualitative.
The following table organizes the different actors, the 6 principles to construct an environmental problem and the possible actions that link them. The labels will be filled with the information obtained in the interview process to main actors, according to the previous indicators and Hannigan principles to socially construct environmental problems.

Table of possible questions to ask on the interview sessions

| **Principles / actors** | Scientific validation | Popularisers | Media attention | Symbolic representation | Economic incentives | Institutional support |
|---|---|---|---|---|---|---|
| **Local level Public** | | | | | | |
| Finances and Investment office | | | | | | |
| Public health Office | | | | | | |
| Public spaces and environmental protection office | | | | | | |
| Human development, urbanism and transport office | | | | | | |
| Culture Office | | | | | | |
| Münster University | | | | | | |
| Münster Police department | | | | | | |
| **Local level Private** | | | | | | |
| ADFC Cycling Münster | | | | | | |
| Bike Club Münster | | | | | | |
| Radio | | | | | | |
| Television | | | | | | |
| Newspapers | | | | | | |
| Other private sponsors and promoters | | | | | | |

*Figure 9.*
*Table of possible questions to ask on the interview sessions*

# PART III

# THE CASE OF STUDY

# 3.1 EVALUATING HANNIGAN'S 6 PRINCIPLES ON MÜNSTER'S CASE.

It is a fact that Münster's mobility system and principles are quite different from most the nowadays world tendencies. This is even more clear if we consider that the total private motorized vehicles fleet has growth 100% percent in less than 2 decades (it has doubled, reaching 1000 million units) as it can be observed on figure #10.

| Historical trend of worldwide vehicle registrations 1960-2012 (thousands) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Type of vehicle** | **1960** | **1970** | **1980** | **1990** | **2000** | **2005** | **2009** | **2010** | **2012** |
| Car registrations(1) | 98,305 | 193,479 | 320,390 | 444,900 | 548,558 | 617,914 | 684,570 | 723,567 | 773,323 |
| Truck and bus registrations | 28,583 | 52,899 | 90,592 | 138,082 | 203,272 | 245,798 | 295,115 | 309,395 | 341,235 |
| World total | 126,888 | 246,378 | 410,982 | 582,982 | 751,830 | 863,712 | 979,685 | 1,032,962 | 1,114,558 |
| Note (1) Cars registrations do not include U.S. light trucks (SUVs, minivan and pickups) that are used for personal travel. These vehicles are accounted among trucks. | | | | | | | | | |

*Figure 10. Historical trend of worldwide vehicle registration. Data collected from before 2013.*[78]

In contrast to this worldwide situation, from 1982 to 2007, the proportion of Muenster's bicycle traffic increased from 29,2 % to 37,6 %, and even more, the proportion of motorized individual traffic decreased from 39,2 % to 36,3 %. That is a massive difference in compare to bicycle traffic in the rest of German cities, which is about 10,3 % with 48,7 % of motorized individual traffic[79].

In that sense, the question remains: How this happen?

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[78] Look for: Stacy C. Davis, Susan W. Diegel, and Robert G. Boundy (June 2011). "Transportation Energy Data Book: Edition 30" (PDF). Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy. Retrieved2012-09-24. *Tables 3.1 and 3.2 for figures from 1960 to 2005.*

[79] Look for: Georg Doehn. Muenster, Germany: An Example of Promoting Cycling in Cities Components of a High Quality Bicycle Infrastructure. Pp. 4

# 3.2 SCIENTIFIC AUTHORITY FOR AND VALIDATION OF CLAIMS.

*Bibliographical evidence*

There is not a very clear register of thesis and research papers related to environmental issues caused by urban mobility on the 70's and 80's decades in Münster. However, it is a fact that the growing number of environmental studies and international symposiums influenced the decision makers at the time to legislate in favor of a more human and environmentally friendly model of mobility. Curiously, in those early studies it was considered that the real threat to the ozone layer would come from a large fleet of supersonic airliners that was never supposed to materialize, and not by the common motorized vehicles[80].

Also, a major event happened at the time, the United Nations Conference on the Human Environment, held in June 1972, turned the environment into a major issue for the international community. This conference happen in Stockholm and settled a declaration of 26 Principles and an Action Plan with 109 recommendations. Some of those were:

*- Rational planning should resolve conflicts between environment and development*
*- Human settlements must be planned to eliminate environmental problems*
*- Science and technology must be used to improve the environment*
*- Environmental education is essential*

[80] Look for: PNUMA. Integrating Environment and Development: 1972–2002. http://www.unep.org/geo/geo3/english/pdfs/chapter1.pdf

*Fieldwork evidence.*

Analyzing Münster through interviews applied to relevant actors in the city, we found that almost all voices agree on the opinion that the turning point towards a mobility based on bicycles happened in the late 70's with the birth of the environmental speeches, the German economic revival and the rapid growth of the vehicle fleet in the country.

Being a developing city with a relatively sparse urban area, the situation in Münster for those years was not of an environmental crisis due to high levels of pollutants in the air, as it was observed in some great capitals of the world at the time, such as Mexico City, Los Angeles, Berlin, Paris, London and many more facing severe problems in its air quality at the time.

Witnesses of that time agree that, in the absence of a serious local environmental, social or mobility problem, almost no research about the case of the environmental impact of automobiles in Münster was developed. However, it is impossible to deny the positive influence of researches all around the world which revealed the seriousness of environmental issues on air, in terms of quality of life, economic costs and social security.

There is also agreement on one part of all stakeholders who were interviewed in the field research. They all consider that Münster could be regarded as an "atypical" case in the world, because in the early reconstruction process, just after World War II in 1948, decision makers in the city had considered that there was an important risk when mixing automobile users and cyclists in one same path, an independent space which was only for bicycles was built; a situation that can be considered slightly progressive at the time.

First promotion campaigns to cycling, walking and using public transport had its origins in the 80s; that is, almost immediately after the first international meetings on behalf of the environment. This unusual speed to follow the advice of international experts drew special attention in two ways: First,

considering that Münster was not at that time a great capital that suffered the severity of an environmental crisis (as it was a city sparsely populated, with relatively low traffic or air quality problems). And second, it stands out the fact that the project had such a positive impact on people that 40 years later, Münster leads the ranking with greater support to alternative transports in Germany and Europe.

In this regard, Peter Wolter (representative of the ADFC in Münster) and Christina Fuchs (representative of the AGFS in the North Rhine Westphalia) consider that the implementation and subsequent success of this evaluation had much to do with notable figures in positions of decision making, which quickly complied with international recommendations and with a long-term vision that significantly facilitated the future transition to alternative means of transportation.

*Conclusion*

For this first principle, is not possible to conclude that the shift on the mobility paradigm in Münster was triggered only by the existence of environmental studies on the 70's and 80's decades, even when the international pressure of the Stockholm conference drew a line of a modern legislation. However, there is enough evidence to affirm that all this events did influenced civil society, researchers and decision makers in Münster to progressively develop a more environmental and human friendly model of transportation, based on their first transport mean after the reconstruction period; which is the bicycle.

In the end, it can be said that Hannigan is right about the necessity of a group of principles, because, in the case of scientific support, it appears as necessary, but not sufficient in itself. It also does not respond necessarily to a chronological order, because it has been observed how environmental studies have emerged on the influence of Münster as a successful model of urban mobility; which means after and not before.

# 3.3 EXISTENCE OF POPULARISERS

*Bibliographical evidence*

One of the most important elements, pointed out by Hannigan as one of the six principles to socially validate an environmental problem and then confront it in search of its subsequent solution, is the existence of campaigns that promote and position certain topics in the collective consciousness[81]. It is therefore a matter of how people promote and facilitate scientific researches or concrete problems in specific regions in such a way that might reach and maintain the issue alive on the public opinion, as much as possible.

On the one hand, Münster has worked systematically through campaigns of alternative transportation promotion and encouragement (mainly bicycles). However, a remarkable element is that they have not only managed the campaigns to keep this issue for a long time in the public interest; they have also positioned alternative mobility means as a desirable lifestyle, constructing a sense of what Münster is and should be as a modern city.


*Figure 11,*
*Münster city, the bicycle capital in Germany seen as a lifestyle reference in Japanese publication[82].*

[81] For the term “collective consciousness” I submit to the Edgar Morin’s general theory, which designates a set of myths and symbols that, at any time, function effectively as a "collective mind" or social collective. It is powered, in its real dimension and its imaginary dimension for the media and could be identified in consumer products and media personalities (leaders, celebrities, etc).

[82] Fromberg, Andrea. Gwiasda, Peter. Planungsbüro VIA eG. Fahrradhauptstadt Münster. Alle fahren Rad: gestern, heute, morgen. P. 45

On the other hand, Münster has developed a whole inclusive model of mobility promotion, based on all level education campaigns. By taking into account the number of accidents
per year and the age rates related to the maximum number of mishaps, the Münster municipality have implemented specific campaigns and strategies for promoting bicycle transportation and accidents prevention “events” in schools together with police / EMS.

For instance, in the time period between 2009 and 2010, medical school at the University of Münster discovered that even when only 1 in 3 cases of bicycle accidents were usually reported to the police office, it was possible to determine a trend on the age of people involved on these accidents so that, based on that information, more concrete and effective education strategies could be developed at different levels.

The study revealed that of the nearly 100 accidents reported between 2009 and 2010 in Münster, in about 35% were grouped in an age range between 20 and 30 years old, as it can be observed on the figure above.

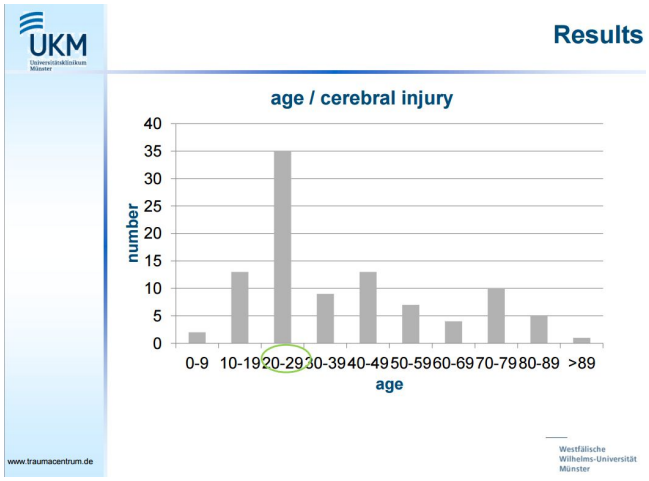


*Figure 12.*
*This figure shows the average of injuries according age ranges. It is clear that the most susceptible group for accidents matches the ages between 20 and 20*[83]

[83] Extracted from: Christian Juhra, MD, MBA. An Interdisciplinary Approach to Reduce Bicycle Accidents. Age distribution. Pp. 13.

After this results, subsequent promotional campaigns for awareness and education where developed and applied on youth groups in Münster.

At the moment, even though it is not very clear when does the education campaigns for cycling promotion and usage of public transport (bus) started, it stands the fact that Münster is, at the moment, one of the main references in Europe and the whole world in this regard.

Nowadays there are a lot of projects for promotion, information, motivation, education and citizen inclusion, reaching different levels of civil society in this north Westphalia city. All these programs come both, from the government side, private initiative or even partnership collaborations, causing a "snowball" effect among individuals in the population who find institutional echo to shape and develop their own ideas. Some of the most relevant campaigns to promote cycling in Munster are:

- With the bike to your job (Mit dem Rad zur Arbeit)[84]

The campaign has the goal of using the bike to get to work, at least 20 days of June and August. As a motivator, participants can win folding bikes, trips and bicycle accessories.

By participating, people will not only win prizes, but they will experience the benefits of continuous exercise. Moderate cycling can reduce the risk of diabetes, certain cancers and cardiovascular disease by 50%. According to a Dutch study, workers who come to the workplace by bicycle, report feeling more relaxed than passenger cars.

- Campaign to avoid bicycle robbery (Bekämpfung des Fahrraddiebstahls)[85]

The Münster police department sets, in performance of their tasks as "bicycle capital", special emphasis on combating bicycle theft. Preventive action plans aim to reduce the number of cases in the area of crime and to increase the

[84] Look for: http://www.adfc.de/news/auftakt-der-aktion-mit-dem-rad-zur-arbeit-
[85] Look for: https://www.polizei.nrw.de/muenster/artikel__2016.html

detection rate. In the area of prevention, the campaign "Mine is mine!" has already started.

In this campaign, Münster citizens are aimed to register their bikes with the police. Registrations are at any police station, with the support of their private partners (ADFC, lost property office and bicycle parking lots of the city of Münster, as well as schools and kindergartens). Bicycle and bicycle owner's data is collected and stored in a backup file as a bicycle passport. Registered Bicycles will also receive a registration badge in the form of a sticker bearing identification security features.

This is intended to bicycles in Münster can be identified and assigned quickly. Potential offenders are prevented from theft due to the deterrent effect.

- Lifecycle project[86]

Lifecycle promotes cycling as a fun and healthy activity that everybody can enjoy throughout lives. Their website and various campaigns run on a non-profit basis to encourage and promote cycling and to create a resource to help interested parties to encourage this activity as well.

*The fieldwork evidence.*

Even though it is true that in Münster the process of transition to a mobility whose most dominant sector is the usage of bicycles, has been slow (at least 3 decades), it is possible to identify key moments that somehow have marked the course of the public policy and trends in the city in this regard. Such is the case of the 80's, time in which various actors showed a strong interest in changing mobility trends in Münster.

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[86] Look for: http://www.adfc.de/news/archiv-news-2011/life-cycle--projekt-legt-ergebnisse-vor

Upon this principle of environmental problems legitimization, field work through key players interviewed, revealed opposing views on the relevance of first dissemination campaigns, which clearly shows a story that is not absolutely linear or permanently in the development process of the city.

With regard to those early years, Peter Wolter, representative of the ADFC in Münster, notes that the significant Western influence in Germany (mainly from the United States), led to a kind of social coexistence that made very desirable the use of private car for daily transportation. In his own words: "In our generation the car still represented a symbol of social status". This situation triggered the regular use of the car, not only within the city of Münster, but throughout the country.

For this reason, dissemination campaigns to promote the usage of alternative transport had a very positive impact on improving the image of cycling and public transportation; so that these two options would no longer be understood as the material representation of a certain socio-economic status, but as intelligent option to move faster and friendlier with the environment; in a city that in those years was growing rapidly.

Contrary to this opinion, Stephan Böhme, current head of the urban planning office in Münster, diminished the importance of dissemination campaigns on those years; his argument is that, since Münster already had isolated paths for cyclists from the reconstruction of the city in 1948, switching to cycling was an expected and natural phenomenon once the vehicle jams began (a fact that was noted in the late 70's). In his words: "Once people began to be blocked by traffic and observing people passing by bicycle and arriving faster, it didn’t took long to switch to bikes and progressively abandon the private car".

In that sense, we could say that, while Wolter justifies the paradigm shift in the process of re-education, Böhme makes it through the intuition skills and intelligence of Münster’s inhabitants.

With regard to current situation, both agree on the preponderant role of today dissemination campaigns; However, for the case of Münster, the campaigns no longer seek to transform the paradigm of mobility, but to bring awareness to young people and education for newcomers.

So, in a city that moves more than 60% of its population by bike, foot or by public transportation, the problem is no longer to convince people to use their bikes, walk or take the bus (they all use it and who does not, generally feel out of standard). Therefore, "The problem is to reduce the level of accidents in these transport means; specially taking into account that each start of semester shows a significant peak in this regard due to the large number of students arriving and who are not familiar with such a massive system of bicycles and pedestrians"[87]. This is the reason why new campaigns work cooperatively with other actors related to the issue of mobility, such as police, health, environment, culture and civil associations offices.

*Conclusion*

When making an overall balance of the dissemination campaigns in Münster some difficulties might jump out at the time of interpreting the data collected; on the one hand we have to face the fact that there are no clear records of when exactly have these campaigns started nor the way they did; this fact slightly difficult to understand the original reasons of their existence, although the evidence suggests that it was a first attempt to discourage the use of private car usage, which was, at the time, the first option of mobility in Münster; a city that was rapidly growing (especially since the late 70s) and that was experiencing, for the first time, moderated traffic jams[88].

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[87] Böhme, S. (2015). Alternative solutions for urban mobility in Münster, Germany

[88] There are no clear official records about this, but the testimony of Peter Wolter (ADFC) and Stephan Böhme (in charge of the Münster's urban PlannBöhme, S. (2015). Alternative solutions for urban mobility in Münster, Germanying Office), strength this version.

On the other hand, in the process of understanding and analyzing the different participating voices of those early dissemination campaigns, there is a slight difference of opinion from the actors involved in those years, about how efficient and necessary were those campaigns. In the opinion of the current director of the Urban Planning Office in Münster, Stephan Böhme, the accelerated growth in the city, continuous traffic jams and the fact that there were already special paths for cyclists since the Münster reconstruction time in the late 40's, facilitated the progressive abandonment of private cars towards the use of bicycles; it means in his own words, that this was a natural and necessary process, rather than a causal fact derived from those first campaigns.

On the contrary, Peter Volke, representative of the ADFC in Münster[89] considers that those first dissemination campaigns were fundamental to the development of environmental awareness and human health conscientiousness which, over time, led the city of Münster become one of the most advanced in terms of alternative mobility, and not only in the North Rhine region, but throughout the whole country.

However, it is possible to observe two important conclusions derived from this principle of social legitimization. On the one hand, the dissemination campaigns, unlike what many might believe (including decision makers) are not the only responsibles for the increased use rates in alternative transport (such as cycling) and other mass means in Münster (such as buses); in the same way, they are not the only responsibles for the paradigm shift of mobility in the city. Although, it is impossible to deny that the large number of promoters and dissemination campaigns have had a major influence and a very positive impact on the conviction and the gradual paradigm shift to an alternative mobility in the city of Münster.

This means that, even when the campaigns of dissemination and information are very important in the process of convincing the civil society, these only

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[89] The Allgemeiner Deutscher Fahrrad-Club. http://www.adfc-nrw.de/kreisverbaende/kv-muenster/serviceseiten/impressum.html

work when they are supported by scientific studies that validate them, and by the involvement of civil society and governmental institutions in parallel.

Finally, it was also discovered that co-working campaigns are more effective to provide information at different levels of interest to society, as opposed to isolated campaigns; Such is the case of Münster, which nowadays makes dissemination campaigns to promote the usage of alternative transports in co-working with the offices of health, culture, police, environment, urban planning and civil society groups. This format has not only brought more information, but it has generated greater feeling of support, safety and inclusion at all levels of interest.

In the end, on the interpretation summary of this legitimization principle for environmental problems, it can be observed that the overall rating of popularizers, as a factor of change, reveals that its only existence cannot guaranty success on developing transportation means and attempting a paradigm shift[90].

## 3.4 MEDIA ATTENTION

*Bibliographic lecture*

According to Hannigan, one of the most crucial elements in strengthening environmental problems is the ability to disseminate them; this is absolutely relevant if we consider that even when a problem can have such a soft language that everyone can understand, without a good media and dissemination campaigns[91], it will hardly remain in the collective imaginary and, as a result, it will be rapidly forgotten.

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[90] This was measured according to the data collected through the several interviews applied to relevant active actors.

[91] Look for: Existence of popularizers. 3.3. P. 62

Thus, the media is a very effective way to bring the whole world news about specific events, as well as influencing the public on its position; either an environmental problem or a solution to that specific problem.

For the case of Munster stands the fact that the gradual shift towards the use of non-motorized means of transport was not the result of a struggle between those who supported the use of cars against those who do not. This happened because, even with the rapidly increasing traffic jams (because of the rapid growth of vehicle fleet) in the city, car users did not have to share the streets with cyclists in almost no time and place. For this reason, people began to leave the car as and started using bicycles or walking in the spaces that already existed at that time.

A consequence of this lack of conflict between users in the process of paradigm shift in the mobility of Münster, was the little importance of traditional given by the media at the time (70's and 80's), when notes related to alternative transportation were only those in which the bicycle or pedestrians were part of official determinations by decision makers.

In later stages in the history of Münster, unconventional communication media (such as internet) have played an important role by showing the mobility model of Münster to the world. This has generated interest among Germans and has caused a "boom" in tourist visits in the area.

This news are closely linked to the promotion of the awards won as the most livable city in the world and its nomination as European Green Capital.


*Figure 13.*
*Munster official web page promoting the most livable city in the world. 2004*[92]

[92] Image extracted from: http://www.muenster.de/stadt/livcom/

*Fieldwork evidence.*

During fieldwork in Muenster, this principle of social legitimization of environmental problems was one of the most striking, since all the actors consulted were categorical in dismissing the relevance of traditional media in the process of change in the paradigm of mobility during the decades of the 70's and 80's.

In the case of Stephan Böhme, responsible for urban planning office, he expressed emphatically that social campaigns were not the ones that triggered the movement towards alternative means of transport, but a large culture of cycling in the city, the prior existence of certain infrastructure in the area, and the self-will of the people who observed that their transportation time records were increasing with the car[93].

In the same vein, Peter Volke and and Christine Fuchs, dismissed the relevance of the media in changing paradigm of mobility in the city; not for the reasons Böhme exposed, but because there was simply no need for the media to denounce any type of conflict. In Volke's words

*"I do not remember a campaign or movement by the media to promote the use of bicycles or walking as an alternative to the car"*[94]

Therefore, the reason for this paradigm shift, in his opinion, were not media campaigns, but educational programs and informative campaigns, organized by decision makers and various segments of civil society.

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[93] Look for: Böhme, S. (2015). Alternative solutions for urban mobility in Münster, Germany.
[94] Look for: Volke, P. (2015). Alternative solutions for urban mobility in Münster, Germany.

*Conclusion*

When comparing what Hannigan believes about the relevance of the dissemination of environmental issues through the media and what has been found in Münster as evidence, jumps a significant discrepancy because, in Münster, the media have not played a role of importance in regard to the early stages of mobility paradigm shift.

This is mainly because Münster is a case whose transition was very smooth in relation to others, as there were prior infrastructure that avoided accidents and conflicts between motorists, bicycle users and pedestrians. And also because they counted with decision makers that took preventive actions on mobility and air quality; that is, before the problem was of great proportions and before general discomfort levels were too high.

Therefore, the case of Münster can be considered special, because one of the principles that Hannigan considered most important and influential to generalize the idea of an environmental problem or an environmental solution, yielded very low values after analyzing the written and narrated history of the paradigm shift process in the city.

## 3.5 DRAMATIZATION OF THE PROBLEM IN SYMBOLIC AND VISUAL TERMS

*Bibliographic evidence*

Suffice to say that one of the most famous photographs in history alternative mobility promotion comes precisely from the city of Muenster, where 3 different options for transportation where showed in a photograph taken in

1991 and that, even today, continues traveling around the world as an universal icon of what sustainable mobility is.

The photograph shows 3 different options (automobile, bicycle and bus) to transport 72 people around the city and, even when there is no legend on the original photo, it makes the observer wonder which one takes less space and which one is the most efficient.

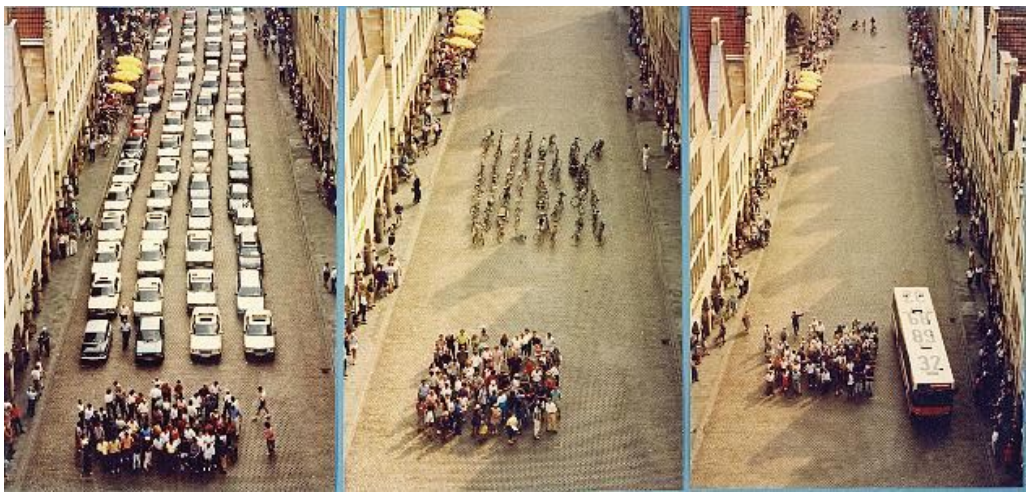

*Figure 14.*
*This image arranged in 1991 in Münster makes clear, much space is needed for72 people in various means of transport*[95]

According to Hannigan, one of the most effective paths to socially legitimize an environmental problem is its dramatization and symbolic representation; and as well as with the dissemination campaigns, a very good developed symbolic representation may reach a great segment of the population involved and influence on them about a certain environmental problem or a possible solution. Nevertheless, it is highly important to have in mind that, due to its great influence on people's mind and opinion, dissemination campaigns, as well as symbolic representation, must be properly supported by scientific research, specially if we think that false content campaigns and icons can produce further dislikes and rapid lose of credibility; moreover the weakening

[95] Wie transportiert man 72 Menschen - und wieviel Platz braucht man dazu? Presseamt Stadt Münster. http://www.focus.de/auto/ratgeber/unterwegs/auto-fahrrad-bus-dieses-bild-wird-ihre-einstellung-zum-auto-veraendern_id_3844157.html

of the legitimization campaigns and prestige[96].

When analyzing Münster, it jumps as a very special case because, at some point, decision makers in the city understood the existence of a mobility and pollution problem even before it happened in the local level, therefore, dissemination campaigns and the develop of a specific iconography worked more as a preventive strategy than mitigation. However these strategies where so well implemented that they succeed influencing almost all actors in the community.

In this regard, Münster has developed and exploited a very effective iconography which relates the city to an environmental friendly space, mostly based on bicycle usage linked as a lifestyle. Furthermore, it is very important to point out that the city has also used their multiple ecological awards to improve the message of a sustainable mobility awareness by generating a feeling of proud and implication in all its inhabitants and stakeholders.

Therefore, once the decision makers decided to exhibit these environmental efforts, not only inside the city, but all over the world through online platforms, Münster has experienced a very positive phenomenon, which is its transformation into an important tourist destination inside Germany.

Nowadays, one of the most popular destinations for a cycling holiday in Germany is the "Münsterland Radel Park": with almost 1 million (of the 3 million tourists) staying overnight and with an estimated of more than 60 million trips per year. This considerable sum in the Münsterland, is mostly caused by the cycle tourism and has generated almost 76 million euros on overnight guests, and a total amount of 646 million euros[97]. A very precise and positive example of the involvement and implication of different social actors in regard of cycling as a lifestyle.

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[96] Think for instance on the case of Greenpeace and its false exaggerated data about the arctic ice melt. In the end, when the lie was uncovered, the NGO suffered a sever credibility crisis. Look for online note: http://www.prisonplanet.com/greenpeace-leader-admits-organization-put-out-fake-global-warming-data.html

[97] Official information extracted from: Fromberg, Andrea. Gwiasda, Peter. Planungsbüro VIA eG. Fahrradhauptstadt Münster. Alle fahren Rad: gestern, heute, morgen. P. 19

*Fieldwork evidence*

The fieldwork in Münster again showed some differences between the opinions of experts and some relevant social actors in the locality. On the effectiveness of symbolic representation and persuasion work, some people believe that representation of alternative transportation has achieved not only a remarkable improvement and development of cycling, environment care and health culture in Münster, but managed to unite all the actors involved through a shared complicity in a project that provides results and a feeling of recognition and pride on their city.

For the case of Peter Wolter, one of the holders of the ADFC in Münster, he believes that the correct development of a symbolic representation of Münster under the concept of a city concerned about the promotion of alternative transportation and environmental care through good air quality, has positively influenced the inhabitants of the city, creating a community and massive sense of pride that reached its highest point with the designation of Münster as an European Green Capital and as the best livable city in the world in 2004. This positive feeling, adds Wolter, fuels the desire in individuals to further improve its transportation system, based on a large number of bicycle users and pedestrians. In the same opinion, Christine Fuchs adds that this development seems to have improved social integration of newcomers (national and foreigners) with regard to the dynamics of urban mobility.

Thus, in their judgment, the creation of a specific iconography for the city, has had a very positive impact and influence by incorporating all social actors, regardless of age, socioeconomic status, national origin, gender or education; all they becoming part of a project which, nowadays, exceeds the limits of Münster's territory and spreads throughout North Rhine Westphalia, Germany and the world.

On the opposite site is Stephan Böhme, head of the urban planning office in the city, who thinks that even when the remarkable development of an iconography based on a sustainable mobility paradigm, has been positive to accept better policies on urban mobility, no one could say that the collective awards that Münster nowadays hold are a direct consequence of such iconography or even more, that those awards are direct responsibles on the union of all actors through a shared sense of involvement and pride.

In this regard, ponder Böhme, achieving awards on the city's transportation model, has just set the bar higher for public administrations, as the people expect to continue getting recognition for which they have already been habituated; that is, in Böhme's opinion, that the achievements of the city reflected in multiple awards, no longer represents a sense of surprise or novelty in the people, but contrary, an increasingly pressure and duty for managers to improve their work.

*Conclusion*

Despite the non unanimous opinions of the leading voices in Münster in regard to the preponderance of this principle of social legitimization of environmental problems, it is impossible to deny that its impact on Münster has been very positive, and even if it can not be decisively concluded that the paradigm shift in urban mobility in Münster is a direct consequence of the symbolic representation of this problem and the solutions (think of the case of the photo 1991 with the transportation of 72 people in 3 different ways), it is true that many inhabitants of the city are actually proud of the achievements they have made over the last decades by supporting a long-term project.

Furthermore, exposure of this iconography directly through official platforms of the city (such as the website), called the attention of millions of Germans and foreigners every year who consider the city of Münster as an attractive destination for vacation and to experience the phenomenon of "friendly bicycle mobility". Of course, this phenomenon has boosted the growth of an entire business model aimed to bicycle users and pedestrian (restaurants, shops,

cafes, supermarkets, hotels and others). At the same time, it has strengthened the alternative model of mobility and it has even helped to increase the number of users of these means of transportation.

## 3.6 ECONOMIC INCENTIVES

*Bibliographic evidence.*

In the case of Munster, one of the main factors which have marked the successful paradigm shift in urban mobility is the capital injection for the free growth of each of the principles to legitimize environmental problems.
In short, this means that the timely provision of economic capital, either local, federal or even from private sector level in Münster, has been decisive in developing numerous advertising campaigns, urban design studies or construction of independent infrastructure for different means of transportation.

Without a doubt, early detection of mobility issues in the city of Münster helped significantly to reduce costs for environmental repairs, while avoiding the reconstruction and upgrading obsolete infrastructure or just unfriendly to alternative means of mobility (as in the case of many world cities today). This, of course, helped Münster considerably to convert their work into a humble but continuous process of improvement and not a permanent cycle of creation and destruction.

This is possible because the positioning of Münster as an international capital of cycling and cycling German capital, has attracted a lot tourists per year; this situation has led to the growth of a whole new business model, intended to the bicycle users and pedestrians, that has generated outstanding incomes. This phenomenon has triggered the involvement of the private sector in the promotion and improvement of the infrastructure for alternative means of transportation.

According to information from the Münster town council, the budget for everything related to alternative solutions for transportation in the city is around 2 million Euros per year[98]; however, to this amount is necessary to add the contribution made by private companies within the city, which are seriously interested in the growth of this particular segment (cyclists and pedestrians).

Thereby, Münster has not only made an efficient work on the subject of public investment to promote a model of alternative mobility, but has furthermore found a way to strengthen this area through the involvement of the private sector.[99],

The last is particularly important in so far as the private sector involvement represents irrefutable evidence against some positions that claim that alternative mobility reduces current spending of people, because its impracticality when loading inhibits consumption. That is, that many Governments and business owners take cyclists not for a serious customer group (wrongly), but just as an investigation of the city of Münster shows, although cyclists give less money per purchase, they come into business more often because of the freedom that the bicycle or the walk path give to their users.

This shift of transportation in Münster drove the business to consider smart options to attract cycling customers loyalty by removing parking fee on bicycles. Therefore, many business in downtown offered facilities to park their bicycles in safe and nice spaces for free and, even sometimes, with special promotions for those who arrived on this mean of transportation. This phenomenon has spread beyond the district centers, at the point that the entire city is nowadays a shopping destination for cyclists.

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98 Look for: Bicycle policies of the European principals: continuous and integral. 4. Münster: Germany's no. 1 cycling city. P. 44.

99 Look for: Andrea Fromberg, Peter Gwiasda. Fahrradhauptstadt Münster. Alle fahren Rad: gestern, heute, morgen. P. 18

In the end, as it was mentioned in the previous segment, the alternative mobility in Münster has been a very lucrative business, with an economic impact close to 246 million euros annually; which represents an important income in taxation and, in that sense, in the caption of financial resources to continue the works and programs to promote alternative options for mobility.

*Fieldwork evidence*

As it was already noted above, Münster represents an atypical case with regard to the promotion of alternative solutions for mobility. For this city, the fact of having a well-defined infrastructure since the time of the reconstruction in 1948 (with separate roads for different means of transport), has made the economic requirements to be used more on education, promotion and improvement of the existing infrastructure.

Hence, the field results for this specific principle have shown a certain unanimity in the leading role of the financial support in the urban construction project of Munster, under the concept of a friendly city for those who are transported by an alternative means.

On the contrary, Peter Wolke, head of the ADFC at Munster, considers that a long tradition of supporting and promoting alternative ways of mobility, besides the continuous pursuit of awards, the huge market growth for this sector and the massive acceptance of civil society, has certainly facilitated the participation of private capital which have helped significantly to improve infrastructure and to implement various promotion, information and integration campaigns.
Thus, as he mentioned:

> once the alternative means of transport (bicycles) are so well regarded by the community, to achieve economic incentives to help fulfill the information and promotion campaigns, it is quite easy; especially

> because, through their involvement, small and large businesses show a very positive image in the community that consume their products[100]

Meanwhile, although Stephan Böhme has openly shown skepticism about the dissemination campaigns as the main trigger for the bicycles usage in Münster, he does consider that the involvement of private capital in the promotion and information of alternative forms of mobility have helped both, its development through infrastructure, education and information, and its impact on the tourism sector, which has made of Münster a recurrent destination for German vacationers, seeking bicycle tours in the area.

Finally, with regard to economic support from the government, Böhme believes that while there is some uncertainty with every change of mayor in the city (regarding to the budget for alternative mobility in the city) he is confident that its use has become a such an entrenched habit, that any neglect or negative change on the urban mobility policies in the city would lead to widespread discontent and severe pressure from inhabitants[101].

*Conclusion*

This point in particular becomes as important as delicate given its possible controversies. Thus, while it is true that the injection of funds to each of the principles of legitimacy of environmental problems can define the direction of success or failure in a particular case, it is also very important not to reduce the whole issue of creation and solutions for environmental problems, to the mere presence or absence of economic founds.

In this case Münster is very enlightening on this point, because without an early detection of the problem, as well as proper planning and a long-term vision project, the levels of bicycle usage would possibly remain low, as it happens in most of the country and, therefore, private investment would never

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[100] Volke. P. (2015). Alternative solutions for urban mobility in Münster, Germany.
[101] Look for: Böhme, S. (2015). Alternative solutions for urban mobility in Münster, Germany.

have come.
In the end, it is possible to conclude that without a general consensus regarding the existence of this environmental problem, plus a subscription to possible solutions, financial resources can hardly be assigned to these causes, even if there is capital available for implementation through various projects; that is, that without a widespread recognition and identification of the problem, it is extremely difficult to obtain resources for their implementation through programs, laws and campaigns.

## 3.7 INSTITUTIONAL SUPPORT

Bibliographic lecture.

When speaking of institutional support, it jumps immediately how important is this point because the support cannot simply be reduced to the state's ability to distribute economic resources or responsibilities; its importance has to do with the very idea of the State as representative of the popular will for legalize, organize and implement programs and activities from social concerns and claims of economic, cultural, social or environmental issues.

Yet it has been found that in the case of Münster, institutional support for the development and promotion of alternative forms of urban mobility has been present for almost all stages of city development; since the early days of reconstruction, to the "boom" of promoting cycling in the late 70's and in the early 80’s. Thus, in the case of Munster, institutional support does not respond, as it happens in other cases, to a popular demand due to an environmental problem, but as a phenomenon of progressive co-working that can be divided into different stages.

On one side is that period which began as a mere security problem in front of the rapidly growing number of vehicles in the 50's decade and which led to the construction of exclusive separate bicycle paths.

> Building density in the neighborhoods surrounding the town center was increased by constructing higher buildings than before the war. Bicycle traffic became a component of general traffic policy as a matter of course, and all main roads were provided with adjacent bicycle paths for reasons of traffic safety[102]

On the other hand, thanks to the spread of environmental discourses worldwide in the late 70's; Münster heeded the recommendations of the experts by way of a precautionary move in front of the rapid growth of the vehicle fleet and the tragic example of severe air pollution on major capitals in the world.

> With bicycles sinking into oblivion elsewhere and many bicycle facilities disappearing between the 1950s and 1970s to make room for cars, the Münster bicycle facilities were well-maintained and steadily expanded [...] In the early 1980s cycling was given a boost. In the first place by a growing environmental awareness, in the second place by the realisation that traffic problems cannot be solved merely by building more roads and that increased bicycle use can improve a town's accessibility and quality of life[103]

It is equally important that this positive trend has not changed over the time, taking this institutional support hand by hand with the growth of the city itself to the point that has been fundamental to the promotion of various campaigns that, nowadays, hold Münster as the German capital of cycling. Moreover, institutions have worked closely with civil society and the private sector, developing policies to protect cyclists and pedestrians in order to decrease accidents in the city and to increase consumption in local businesses; some of

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[102] Look for: Bicycle policies of the European principals: continuous and integral. 4. Münster: Germany's no. 1 cycling city. P. 41.
[103] Ibid. Pp. 41-42.

these collaborations include: the extension works for bike paths, construction of the green ring (pedestrian and bicycle), speed limit reduction in the city for cars to reduce noise levels, the construction of the largest bicycle parking lot in Germany and the signing, in commitment, to the national climate protection program for the improvement of energy and environmental conditions by 2020

Finally, perhaps the most important institutional support to the demands of spaces for the use of alternative means of transport, is the fact that government institutions in Münster have taken the lead by promoting the responsible use of alternative transport in the city, assuming the leadership, being the visible head and taking into account all the various aspects involved in bicycling and walking as a lifestyle; from education in children, to promotion of safety in car users; the campaigns and infrastructure development to reduce accidents and the various measures to prevent thefts.

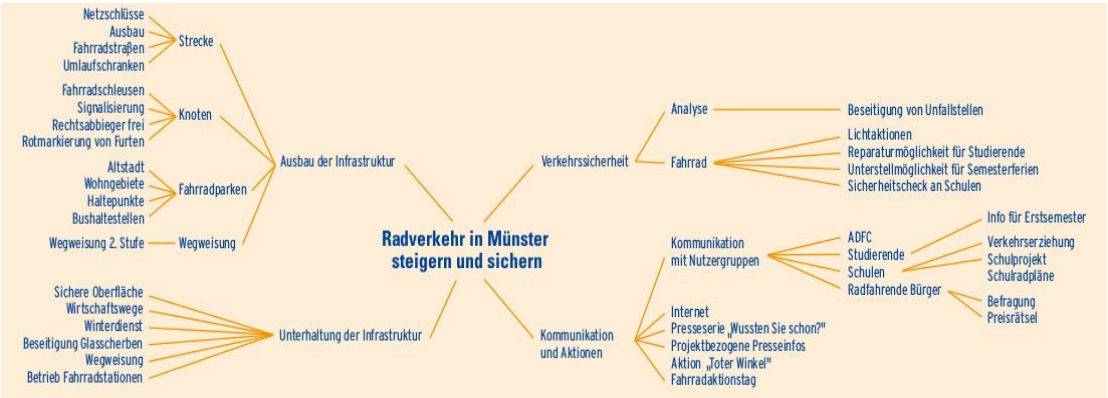


*Figure 15. This figure represents Münster governmental cycling and walking plan structure 2010*[104]

Simply put, institutions in Münster have taken leadership as the visible head and executor of long-term projects that take the concerns of the inhabitants and that works with them in order to improve economy, social integration and the environment care.

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[104] Extracted from:Look for: Andrea Fromberg, Peter Gwiasda. Fahrradhauptstadt Münster. Alle fahren Rad: gestern, heute, morgen. P. 66

*Fieldwork evidence*

An important question that could be made when analyzing the active role of institutions in the case of promoting the use of alternative transport in Münster, is what is the reason why there has always been such an important institutional support in Münster, especially in the case of bicycles?

The answer is not easy, however, in the opinion of some experts as Stephan Böhme or Christine Fuchs, this phenomenon probably has to do with the fact that the bicycle has always been there; ie, that even in the period of greatest growth in the motorized vehicle fleet, the bicycle was always a mean of transportation used and with which people were familiar; so that their "rescue" as a fundamental mobility option was not really a struggle situation against the cars users, rather it was re-education work and a process of upgrading the existing infrastructure to put it again on the radar.

According to Peter Volke, the involvement of the institutions on the issue of alternative mobility is the key element and the most decisive factor. In his opinion, it is the active example and institutional leadership in this area, what really boosted the paradigm shift in mobility, even beyond the active society in the 70's and 80's Münster.

Therefore, when it was asked to Volke about the reasons of why the local government decided to actively support alternative mobility in Münster, he said that the involvement and claims of society had much to do; however, he praised the work of Jörg Twenhöven (City Mayor between 1984 and 1994), who, besides being a bicycle enthusiast, he promoted this mean of transportation by its constant use.

> Jörg Twenhöven led by example in those years. During his 10 years in office as mayor, he traveled more than 10km daily on his bike from home to government offices and back. So he was there, elegantly

> dressed and traveling by bicycle even when he had the chance to do by car[105]

This situation generated the sympathy of many people and groups in favor of the environment and the bicycle inside the city; which, in the opinion of Volke, facilitated the transition of paradigm within the city because there was a commitment to the cause from the very head of the government.

*Conclusion*

In the end, on this principle of social legitimization of environmental problems, it is possible to say that even when (by itself) recognition and institutional support of environmental problems does not represent or creates social acceptance or makes real its existence, it is possible to say that institutional support plays an important role, because its job is to link all the other principles, so that they can subsequently be reflected in laws, infrastructure and development by means of local, national or international level agreements, and by validation or execution of programs for civil society.

In simple words, institutional support represents the final movement to recognize and legitimate an environmental problem; because to fully built and successfully develop them, there must be an institutional support attesting to its legitimacy and helping to ensure its continuity. This is especially important since the positioning of an environmental issue on the political agenda shortens the way to its legislation. Internationally, this can be observed on the important role played between States and NGOs, influencing United Nations international statements, agreements and rulings.

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[105] Look for: Volke, P. (2015). Alternative solutions for urban mobility in Münster, Germany.

# PART IV

# DATA INTERPRETATION & RESULTS

# 4.1 EVALUATION OF THE SHIFT IN THE PARADIGM OF MOBILITY

*Hannigan' s principles are not independent categories*

After the literature review that involved a de-constructive process of history of mobility in Münster and a field work based on interviews to key players in the process of building the current model of urban mobility in the city, it was possible to make an accurate exposition of the most relevant elements in the process of change, the presence of levels and influence of the 6 Hannigan principles that were obtained during the process.

One of the first thing that jumped out when re-arranging all the information obtained, it was observed that, the 6 Hannigan's principles of environmental problems construction, did not displayed as well defined structures, as Hannigan considers in his research, but as a more fuzzy and interpretative instance. In other words, it was very difficult to think about the "real world" evidence matching independent categories that would be further organized. In that sense, some governments, NGO's, or even civil society activities could be interpreted simultaneously as two or more principles.

This is very important in the sense that, even when Hannigan set his 6 principles as independent boxes or "categories", the relationship between them in real cases of study, does not occur or even behave in the same way; therefore, this small (but important) gap must be considered in further researches; theoretically discussed and analyzed in a deeper manner.

To temporally solve this gap, some of the most relevant evidence was analyzed and marked as all its possible interpretative options inside the 6 Hannigan's principles. By making this, it will become clearer that the social construction of environmental problems and solutions is not a linear, but a

complex and full of interpretative elements process.

| **Strategic actions and programs considered as evidence.** | Scientific validation | Popularizers | Media attention | Symbolic representation | Economic incentives | Institutional support |
|---|---|---|---|---|---|---|
| Infrastructure construction & development | | | | X | | X |
| Senior infrastructure facilities | | | | X | | X |
| Environmental studies and Research | X | X | | | | |
| One mayor as the first bicycle user | | | X | X | | X |
| Promotional campaigns in schools | | X | | X | | X |
| Security campaigns in schools | | X | | | | X |
| Security programs (bicycle passport) | | X | | | X | X |
| Health campaigns in schools | X | X | | | | X |
| Most livable city Award 2004 | | | X | X | X | X |
| European Green Capital award | | | X | X | X | X |
| Online Dissemination campaigns | | X | X | | | |
| Accident rate research | X | | | | | X |
| Traffic levels measurement | X | | | | | X |
| Münster's photographic campaign (72 people moving on 3 means of t.) | | | X | X | | |
| Private sector investment on bicycle and pedestrian friendly business | | | | | X | |
| Subscription to Germany's National Climate Protection Program | X | | | | X | X |
| ADFC printed campaigns and info. About Münster. | | X | | X | | |
| Hotels and restaurants construction | | | X | X | X | |
| International media writing about Münster as Germany's cycling capital | | X | X | | X | |
| | | X | X | X | X | X |

*Figure 16. This figure represents the interpretative possibilities between the found evidence and the 6 Hannigan principles.*

*The relationships*

Secondly, it was found that the links and relationships between the 6 Hannigan principles and the most relevant actors where also not univocal (as it was observed and noticed with the strategic actions and programs considered as evidence); according to the actors considered before[106] it was observed that one actor can fit simultaneously into two or more principles. It means that the relationships between the different actors and the principles are not linear, but complex, as it shown in the table below.

| **Principles / actors** | Scientific validation | Popularisers | Media attention | Symbolic representation | Economic incentives | Institutional support |
|---|---|---|---|---|---|---|
| **Local level Public** | | | | | | |
| Finances and Investment office | ES<br>IfR<br>CW | DC<br>IfCcW<br>CW | Not apply | Not apply | Support | CW<br>IfCcW |
| Public health Office | ES<br>CW | DC<br>IC<br>CW | DC<br>ES | IC<br>CW | IfCcW | CW<br>IfCcW |
| Public spaces and environmental protection office | ES<br>CW | DC<br>CW | DC<br>ES | CW | IfCcW | CW<br>IfCcW |
| Human development, urbanism and transport office | ES<br>IfR<br>CW | DC<br>CW | DC<br>ES | IC<br>CW | IfCcW | CW<br>IfCcW |
| Culture Office | Not apply | DC<br>CW | DC | IC<br>CW | IfCcW | CW<br>IfCcW |
| Münster University | ES<br>CW | CW | ES | IC<br>CW | IfR | CW<br>IfCcW |
| Münster Police department | Not apply | Not apply | ISC | ISC<br>CW | Not apply | IfCcW<br>CW |
| **Local level Private** | | | | | | |
| ADFC<br>Cycling Münster | Not apply | DC<br>CW | DC<br>CW | IC<br>CW | IfCcW<br>CW | Not apply |
| Bike Club Münster | Not apply | DC<br>CW | DC | IC<br>CW | IfCcW<br>CW | Not apply |
| Radio, TV, Newspapers | Not apply | DC | DC | IC<br>CW | Not apply | Not apply |
| Other private sponsors and promoters | Not apply | IfCcW<br>CW | IfCcW | IC<br>CW | IfCcW | CW |

*Figure 17.*
*Relationships between actors and Hannigan 6 principles, according to the indicators and questions asked on the interview sessions.*

[106] Look for: 2.8. Deconstruction elements for the Münster case.

*Factors of change*

After the different actors and their activities related to the construction of a new urban mobility paradigm were processed and analyzed in its complex relationships, the 6 Hannigan principles were analyzed too. Thus, to process all the information obtained through the bibliographic and fieldwork evidence, it was necessary to set some analysis categories to evaluate the relevance of each principle as so, and then determine if they were all equally necessary to construct Münster's mobility paradigm. The categories chosen to organize the data obtained were:

*Factual presence of the principle*

This refers to how strongly was the principle found in each case of analysis; it means that, according to bibliographical and fieldwork evidences the presence of each principle will be tracked and represented in its intensity.

*Paradigm effectiveness*

Paradigm effectiveness refers to the positive or negative impact that a principles presence provoked on any specific case. Therefore, a negative impact will be assumed as a low effective rate or level while, on the contrary, a positive impact will be assumed as a high level of effectiveness.

*Co-working capacity*

This is understood as how, different governmental offices, private institutions and NGO's can cooperate and work together in order to create, develop and follow any program related to urban mobility. As it would probably will be imagined, the nature of the actor participating in one specific principle, should not influence in its capacity to co-work

*Private sector involvement*

This refers to how is participating the private sector for each principle. For this case it is important to notice that this must not be reduced to an economic instance; on the contrary, the private sector involvement could also refers to

any kind of active participation.

*Civil society involvement*

In the same manner as the private sector is considered, the civil society involvement refers to any kind of active participation regarding any of the 6 different Hannigan principles. In that sense, civil society involvement considers participation as users of the infrastructure and as claimers for any possible change.

*Social impact*

Social impact refers to the positive or negative impact that a principles presence provoked inside the society as users on any specific case. Therefore, a negative impact will be assumed as a low effective rate or level while, on the contrary, a positive impact will be assumed as a high level of effectiveness.

*Social acceptance.*

There are some cases where, despite the positive impact of a specific program or activity, this still does not consolidate the acceptance from the audience. Therefore, a successful principle development is not only about its efficiency, but also about how is presented to the audience.

Regarding each principle, intensity values where assigned according to the content of the interviews and research sources. According to what was observed, a qualitative range was set with the following “factor of change” levels:

| | | |
|---|---|---|
| *- Null (N)* | *- Very low (VL)* | *- Low (L)* |
| *- Regular (R)* | *- High (H)* | *- Very high (VH)* |

| DEVELOPMENT CRITERIA | SCIENTIFIC VALIDATION | POPULARIZERS | SYMBOLIC REPR. | ECONOMIC INS. | MEDIA ATTE. | INSTITUTIONAL SUPPORT |
|---|---|---|---|---|---|---|
| Factical presence | VL | M | VH | VH | L | VH |
| Paradigm shifting effectiveness | H | M | M | H | VL | VH |
| Governmental co-working | M | VH | VH | H | L | VH |
| Private sector involvement | M | H | VH | H | VL | H |
| Civil society involvement | VH | VH | H | M | N | H |
| Social impact | M | M | H | VH | L | VH |
| Social acceptance | 4 | H | VH | VH | M | H |

*Figure 18.*
*Hannigan 6 principles as factors of change. This table represents the evaluation of the data collected across the bibliographic and fieldwork.*

# 4.2 OBSERVED RESULTS

First, when we look separately how they happened in Muenster each of the six Hannigan principles to socially legitimize environmental problems regarding urban mobility, we find that each one has been, somehow, relevant in the process of acceptance of the problem and the later construction of a new model of mobility; However, after re-assembling the pieces of history (previously deconstructed) we find much more accurately the relevance of each of these principles.

*What was expected*

After all the previous evaluations, the results trowed that in the case of Munster, institutional support was the element that most influenced the mobility paradigm shift; followed by the symbolic representation of the problem and economic incentives. In other words, this first evaluation of the change factors of social paradigm, showed that the main factor of change was the timely existence of political will and action, followed by the visual contents that facilitated the creation of informative campaigns and, in that sense, the acceptance of almost the entire audience.

As it was already explained previously, this result may be due to the quick response by decision makers since the late 70's and 80's decades against the environmental threat, powered by the uncontrolled growth of the vehicle fleet in the region, and making the institutional work of recognition and support, more preventive than corrective.

Moreover, the involvement of civil society and the private sector, performed key elements by growing a whole new business model that facilitated infrastructure development plans. The construction of mechanical workshops, clothes stores, coffees, restaurants and hotels (among many others) across the Munsterland cycling path, triggered the massive affluence of tourists every year. In that sense, they influenced in a very successful manner the different social strata and consolidated a real shift in the mobility paradigm.

In the end, this is why this strategy should well be considered as holistic, given its inclusive nature and how promptly touched almost all the 6 basic principles that Hannigan refers in his research on the social construction and validation of environmental problems.

*What was not expected*

In this regard, one of the most prominent elements to analyze was the almost null media role as a factor of change, towards an alternative model of mobility in Münster, as can be seen above in the figure 18.[107]

This took place due to the fact that the task of the media, according to Hannigan, depends largely on the number of conflicts in connection with a particular environmental problem and public recognition; This is mostly because (as it was previously explained), environmental problems are understood as such when they get social recognition.

As an example, the phenomenon of ozone levels reduction in the upper layers of the atmosphere (the so called “hole in the sky”) became an environmental problem only when it was socially accepted, first by the scientific community, then by the Media and eventually, recognized as a threat by the whole population.

But, for the concrete case of Münster, the story was not exactly the same. The environmental problems of street space, air pollution and noise, were not happening in the local level; it was more the recognition of a possible further problem, born from the decision makers and supported by the civil society. Therefore, the media attention, at least in the local level, was not requested because, on the one hand, there was not a clear developed conflict to follow and, on the other hand, there was already some attention regarding this problem on the international level[108] through the exposure of other cases facing critical environmental situations, and that were listened (at least in Münster) on time.

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[107] Look for figure 18. P. 97

[108] Some scientific research, such as limits to growth in 1972, as well as public demonstrations such as the Earth Day in 1970, triggered the relevance and the exhibition of environmental issues in the media. And even when in the decades of 70's and 80's they did not have a major role to change international policies, they settled the basis for massive exposure of such problems after the the 90's decade. Look at: Yuki Sampei, Midori Aoyagi-Usui. Mass-media coverage, its influence on public awareness of climate-change issues, and implications for Japan’s national campaign to reduce greenhouse gas emissions. P. 205

# PART V

# CONCLUSIONS

# 5.1 CHALLENGES AND DIFFICULTIES

*A complex reality inside 6 theoretical categories.*

When Hannigan wrote his theory of social construction of environmental problems, he considered that the best way to organize this process was through 6 principles or categories that were constant over all his analyzed cases; this was a tremendous step forward because it facilitated greatly the understanding of the theory's main argument (that there is a social reality which (in turn) determines the way a problem is considered as such) and it also helped to organize all the evidence in the process of acceptance, subscription and construction of a solution to these problems.

However, categorizing empirical evidence supposes a very complex task for the same reason as it was previously discussed; this is the fact that if the reality is influenced by social structures such as history, culture, psychology and others, then it is not possible to talk about an ultimate and completed reality, but of a reality in an endless process of construction and where the evidence is always and interpretive element. Therefore, any Münster's evidence could be interpreted in such a way that belongs to one or more of the 6 principles of Hannigan simultaneously.

This (as can be imagined) had a major impact on the Münster case of investigation, due to some complications derived from complexity involved in organizing evidence in theoretical categories and the generation of questions that would be important to address in further investigations.

*A deconstructed story*

One of benefits that were observed by using the deconstruction theory (offered by Derrida), is that one can disassemble in detail all the parts of a specific discourse. Then, for what was observed in Münster, was very important the fact that not all discourses (bibliographic and interviews) matched perfectly; in fact, it was noted several times that between the same actors interviewed, their perception of the same process of building the current model of mobility in Münster was very different and even in some cases, completely opposite.

For instance, as it was noted in the case of why people started using bicycles in Münster, while Peter Volke (representative from the ADFC) attaches great importance to the policies of those years, as well as promotional campaigns, Stephan Böhme (head of Muenster's urban planning office) believes that this was a natural phenomenon due to traffic problems in those years and the previous existence of exclusive roads for bicycles.

In the end this new and no univocal story, which was obtained from the deconstruction process of the case of Münster, happen to be very useful, because a detailed analysis of the different views and versions of actors involved in the process of building the paradigm of mobility in the city was achieved. Uncovering a richer, broader and more complex picture on the construction of environmental problems and solutions than was originally thought.

*A theoretical gap*

In a broad sense, Hannigan believes that the process of social construction and solution for environmental problems, must necessarily pass through the six principles that he himself establishes; it means that the social construction of environmental problems comes down to the existence of these six guiding

points.

However, it is very important to analyze the results obtained from bibliographic and the fieldwork evidences (especially the case of the attention and involvement of the media), because this attention absence as a factor of change in the mobility model in Münster, could be easily misunderstood as an inconsistency in the Hannigan's analysis of the importance of the 6 principles for the social legitimization of environmental problems. Thus, although in the specific case of Münster the media attention did not play a major role, it is not possible to conclude that theory must be repaired or, even more, to think that the principle must be excluded from the list. The real meaning of this evidence in theoretical terms, it is that the level of presence of each of the principles may depend on the specific conditions of each story and each location.

This means that while in the case of Munster, considering their own political, historical and social conditions, media intervention was not needed to expose and confront environmental concerns among various stakeholders, it represents only a special case and not a standard for other cases of legitimization of environmental problems.

Therefore, based on the results obtained, it can be said that the levels of presence and effectiveness as change factors in the recognition and validation of environmental problems, this may vary from case to case. So what has happened in Münster, might not necessarily be replicated in other circumstances.

Moreover, the obtained results also helped to confirm the hypothesis with which the present investigation was opened; that as an "environmental problem" is basically a social construction which its validation can be eventually reflected in concrete changes on customs, culture and legislation; the derived process of shift is essentially, just like the development of environmental problems, a social construction.

The latter was possible due the process of deconstruction of the history of urban mobility in Münster; its successes, mistakes and the role played by the different social active actors at the time.

Certainly, it is important to highlight that although the assertion of the hypothesis in this study might suggest that Hannigan made a mistake by not delving into the phenomenon of environmental solutions in his text "Environmental Sociology", this does not suggest in any way the existence of an error in his theory. In any case, this research can be understood as a small corollary to his thesis.

## 5.2 FINAL OBSERVATIONS

It is very important to point out that, given the fact that this research arises from within the Institute for technology and resources management for the tropics and subtropics, the analysis of a case as Münster in Germany, does not contravene the main objective of this institution, which is the research for sustainable development in that concrete area.

As it was specified from the beginning of the research, the design of a model to assess the process of environmental problems construction, related to urban mobility, was applied in the city of Münster because it represents a successful story in terms of recognition and social construction of a new paradigm in mobility and environmental awareness. Therefore, the Münster case of study is just a small step towards the consolidation of a model whose ultimate goal would be the correct diagnosis and its smooth implementation in developing regions.

In the end, it is expected that further research can help to improve weaknesses in this proposal and that, ultimately, it can be consolidated a model by which can be analyzed accurately the state of the art in different cases of environmental problems caused by urban mobility, and also providing strategies for possible (socially constructed) solutions, .

For this reason, I consider appropriate to close this investigation which, as an analysis of Hannigan's constructionist theory, has focused on the social construction of alternative solutions to the problem of urban mobility in the city of Münster, Germany. And although I believe that the objectives that I have drawn were successfully completed, I am fully aware that the investigation is far from being exhausted, especially because it is so fundamental and wide in its various possibilities and approaches.

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# ANNEXES

# STEPHAN BÖHME

## Head of Münster's Urban Planning office.

Münster, North Rhine Westphalia

16- Jun- 2015 (11:00 am)

**Münster's mobility paradigm. Interview**

*1- Was Münster a "bicycle city since always"?*

yes, bicycle was since always a mean of transportation in Münster, and with the begging of urbanization, planners before me developed new plans for design and started rebuilding the city after second world war; the built a 2 line-street: One was made for the farm industry and the other had to connect with 6 other towns.

After some time, the city started to experiment traffic jams because of the growth, so, a very common idea at the time (70's decade) was to demolish some buildings inside the city to make more and bigger streets, but, some of those buildings were just constructed after the war (20 years before); so, the government at the time asked for alternative solutions to improve transportation in the city without this buildings demolish.

Some of the solutions through policies included bicycle promotion; and it was a very good idea, because at that time, the traffic conditions were so bad that the people traveling by bicycle could pass faster than the cars. This was the beginning of the bicycles promotion and its infrastructure improvement.

Later, on the 80's and 90's, there were so many measures to improve bicycle traffic (at the beginning promoted and pushed by the emergent green party) until what you can see today; but it was a slow process of mind changing.

*2- Do you remember some struggles and opinions against the bicycle usage in Münster in those early times?*

Not really, after the second world war there was a decision making that favored the bicycle usage through the construction of a separate roads; one for cars, and the othe one for bicycles. Then, when the traffic jams came, a lot of car users jumped to their old bicycles... Specially because it made sense. It was easy, fast and safe.

*3- In those early years, do you remember any campaign to promote the usage of bicycles, public transportation or simply walking?*

Not really, there were not so many campaigns. People tried to take the bike because it was easier to go from a to b than by car. Then, after few years, cycling in Münster became "mainstream", and despite some difficulties such as the weather in winter, more and more people started to use it.

So, no matter what was the activities (shopping, cinema, school), people was moving by bicycle; it became normal. And that was the "break point" because when you are new in the city or even young, you might want to do what is considered "normal". So, for example, a new student might feel bad without a bicycle and the he probably go to his home and bring his bicycle.

This is why we have to be very careful in advising the newcomers (about alcohol drinking and basic traffic rules). Every year there is a clear pick in the accidents rate because they are not used to such a massive number of cyclists in the city

*4- Do you observe any relationship between social status and the private car usage?*

In Germany it is common to think that if you have a nice car, you must be a successful person; however, even when in Münster also happens, is not that much. Almost everybody here knows that you don't have to show a car to

proof who you are. In my case, I drive home with my bike and I see people respect me for who I am. But this is mostly a new way of thinking, new generations try to look for the best way to move inside the city, so, if the car represents a heavy load, young people prefers to do something else with that money. So it is no longer an icon of Status Quo.

*5- In a city like Münster, with a population bellow 500,000 inhabitants, do you find as a good idea to invest in a metro system?*

This is very difficult, specially because that kind of infrastructure is really expensive and we already have some good train network that connect the different small towns in the "Münsterland". Besides, we find ideal conditions (geographical) to better promote the usage of bicycles; and that is a luxury that some others simply cannot.

And this is very nice, because bicycles make cities more human; so, when you travel by bicycle, you can say "hallo" to your neighbors, see how they are, breath some air. Otherwise, with your car people es somehow trapped inside the vehicles. A simple "hallo" makes the entire difference.

*6- Does the Urban Planning office co-works with some other offices to improve the conditions of mobility?*

Totally. We work together with all the other departments such as the police, so we can develop new plans and improve mobility conditions. He have this group called "the round table for bicycle traffic", where people from many offices (from the government and civil society as well) sits and discuss of how to work together to improve the conditions of bicycle mobility. As well as with public transport.

*7- Münster have won several awards for being a green and sustainable city, it is also the place with less deaths due to heart attacks. Do you see a direct link between this current situation and the usage of bicycle?*

Absolutely, there are researches about how 30 minutes per day of corporal movement can help substantially to improve peoples health. Nowadays we try to promote this by giving the information to the people through different campaigns in co-working with the health office.

Also, he have some studies that prove that workers that use bicycle have reported less days off due to diseases than the ones who don't use it. And we want to make this even bigger, specially because Münster have received so many refugees from all over the world, so we feel it is our duty to include them to society through bicycle and not to push them away. This has been a very nice experiment to integrate Germans and foreign refugees.

*8-Do you think the awards won by the city help to improve the opinion and the effort of the inhabitants to keep on the same "Route of development"?*

I'm not so sure about that. I think people feel proud about the city, but I also think that once people are used to win awards, the pressure goes more to the government. I mean, the awards just set the bar higher for public administrations, as the people expect to continue getting recognition for which they have already been habituated.