CITIES AT HUMAN SPEED: A FAVORABLE WAY TO REDUCE THE PACE OF MODERN LIFE. PULL AND PUSH MEASURES FOR CHANGE.

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ABSTRACT

Walking is the wealthiest and fairest, healthiest, safest and strongest, smartest and greenest form of transport (Government of Scotland, 2014). Since Walking is part of the daily life of most people, that is why it is often taken for granted.

To achieve a city for pedestrians, urban planners must reflect on how to stop designing cities with dispersed, discontinuous, and car-centric urban models, because it will be impossible to reverse this trend of development. Currently, contemporary cities must face the stress of its population, due to the speed of urban life, traffic congestion, long travel distances, etc.

This research is underpinned by how pedestrian's scale contributes to better urban environments and for the welfare of citizens through the development and implementation of policies and strategies for encouraging walking. To address this issue, it tries to identify the factors that determine walking, and it explores some existing strategies at three administrative levels: local, regional, and national. In this regard, it proposes push and pull measures as the potential to help more people to walk. The city of Pontevedra is selected as a case study because it is considered a case of success. The results indicate that there is necessarily a transversal organization of mobility in the administration, adequate combinations of pull and push measures have shown to have the greatest effect, and interventions tailored to different parts of the city.

1. THE INVISIBILITY OF WALKING

Walking characterizes the most accessible and greenest way of mobility (International Transport Forum, 2018). Furthermore, people walk to get fit and feel good, and because it is appropriate and social (City of London, 2018).

On the contrary, physical inactivity is responsible for over 5 million deaths annually through its effects on multiple non-communicable diseases (such as heart disease, stroke, cancer, etc.) (Sallis et al., 2016) and it is the second biggest cause of global mortality (Government of Scotland, 2014).

However, walking trips have been largely ignored as a mode of urban transport (CEOs for Cities, 2009; ITF, 2012; Rietveld, 2000), or that walking is treated as the ‘Cinderella of transport modes’ (Paroah, 2003) despite being the most important of all. Since walking is part of the daily life of most people, it is often taken for granted, which Goodman (2003) calls 'the invisibility of walking'.

The understanding of nonmotorized modes of transport - walking and cycling - is extremely complex. However, in the existing literature, walking is often presented along with cycling (Litman 2017; Buehler & Pucher, 2017; Active Living Research ALR ,2016; Krizek, Forsyth & Baum, 2009; Ogilvie, 2004; Saelens et al., 2003; Tolley, 2015, 2003; Rietveld, 2000). Although there are complementary, greener and sustainable modes, each mode has its distinctive features, and they should be separated in data As Nadal said, it is crucial to promote active mobility, but also ‘smart mobility’ understood as the one that each person needs in each circumstance and at each moment of their life (Nadal, 2020).

Walking can be characterized along the four 'As' adapted from Carruthers, Dick & Saurka (2005) to understand urban transport: i) Affordability is very high since walking is a universal mode for all citizens, except in some cases of mobility impairments. It does not require any vehicle, it is free; it only requires capable legs and energy to cover the distance; ii) Availability is high since other modes are limited through routes, schedules, and frequencies. Walking is the most available mode of transport, limited only by potential difficulties to walk for long distances, safety concerns, or barriers along the route; iii)

Accessibility is high, most people can reach a certain place on foot. iv) Acceptability depends on the pedestrian; external factors or some individual perceptions, such as personal security, can boost or deter from walking. Citizens are all pedestrians, but they don’t have the same conditions to walk (physical, economics, etc).

The study of pedestrian mobility is difficult to address since it is challenging to explain the pedestrian behaviour and the interactions between urban structure, mobility habits, and other factors (Krizek, 2000). Walking is often overlooked as a mode when measuring transport behaviour for the purposes of planning. (ITF,2017).

Walking can be used for different purposes (Paroah, 1996): i) as the sole mode to go from one place to another. In London, it includes a quarter of all daily trips (City of London, 2018); ii) as a means of reaching other modes, e.g., for going to the metro station, to the bus stop, to a parked car. In the US, there is a major reason to walk (Besser and Dannenberg, 2005); iii) as a means of using public space, e.g., to meet other people or window shopping; iv) as a recreational and leisure medium, like long walks without a specific reason or destination or playing in the streets (tend to be longer).

Most surveys only collect the first and second purposes, and it is difficult to obtain reliable data on walking. Their methodology focuses exclusively on car travel and public transport, without taking into account the share of pedestrian trips, even when it is an important component (ITF, 2018; Litman, 2017; Pozueta, 2007; Rietveld 2000; Socialdata, 2013; Trolley, 1990) and excluding walking journeys of less than ten minutes (Litman 2017; Paroah, 1996; Sanz 2004) or it goes together with bike. Consequently, this will limit the comparison of the share of walking between different sources (European Road Safety Observatory, 2006).

Indeed, 63% of all urban trips are less than 5 km in length (ITF, 2018). Thus, it opens a great opportunity to encourage walking in urban areas. Likewise, slightly more than two-thirds of Europeans walk every day (68%) while half use a car every day (50%). However, roughly one in ten Europeans (12%) never uses a car (European Commission, 2013). The weight of the pedestrian mode in many cities is not to be underestimated: in central Paris, the walking modal share is 47%, followed by Barcelona with 44%, New York City with 39%, Mumbai with 33%, London with 32%, Madrid with 30%, Berlin with 29%, Vienna with 27% and Shanghai with 27% (ITF, 2017). Consequently, as Litman (2019) said, “Improving travel options and reducing vehicle traffic tends to benefit everybody in a community”, since inadequate mobility is an important element of social exclusion that determines the level of urban poverty (UN-Habitat 2013).

The present research aims to reflect on the current accelerated pace of life in cities and how to reduce it through the possibilities offered by pedestrian mobility. It starts identifying factors that determine the choice of walking. Secondly, it analyses some examples of policies and strategies for encouraging walking that have launched in three administrative levels: local, regional, national, and presents a review of push and pull measures for increasing walking. Finally, the city of Pontevedra provided the empirical focus. It has been selected because it is considered a case of success and a worldwide reference.

2. CHANGING SPEED OF URBAN LIFE: PEDESTRIAN SCALE

With the outbreak of the coronavirus pandemic in March 2020, cities suddenly stopped, mobility and noise ceased; citizens became more aware of the speed at which they were living and the way of life that was had acquired. Many of the drawbacks of the current urban model have provoked new debates on the need to favor the proximity of daily activities at the neighborhood level, density, and the lack of public quality space. In European cities, by 70-80% public space is occupied by the car (EU, 2020).

Before this health crisis, the climate emergency was giving signs that it was not possible to continue living at this rate of energy consumption and with these environmental repercussions.

On the other hand, people living in larger cities with high urbanization and increasingly sedentary work, are more likely to be physically inactive, to have a higher prevalence of depression and stress, because of the accelerated urban environments and lifestyles.

Now more than ever, humans need to walk to be in contact with others and they need to share public open spaces. In this regard, the quantity and quality of pedestrian public space determines the urban quality. Today, people are full-time interconnected, but at the same time it's seems to be the most disconnected time from their environment. Outdoors's environment can reduce stress and aid recovery from stressful conditions (Thompson et al., 2011).

As Gelh (2014) said, the public space is good when there are many nonessential activities in it, when people go out into the public space as an end in itself, to enjoy it and spend time in it (Monheim, 2003). It gives a sense of belonging. Walking not only depends on the pedestrian facilities but is also highly dependent on the built environment (Krizek et al., 2009; Adkins et al., 2012). Monotonous and uninteresting scenarios can deter walking on foot. Conversely, attractive, safe, socially animated scenarios stimulate people to walk more (Pozueta et al., 2013; Saelens & Handy, 2008). Indeed, in many cities, creating attractive walking environments has increased retail turnover and pedestrian flow (Tolley, 1990; TEST, 1988, Government of Scotland, 2014).

Pedestrian mobility implicates highly competitive travel time over short distances, but competitiveness decreases as distance increases, compared to other modes (Pozueta et al., 2013). The travel time per pedestrian per trip that is acceptable by a person is established between 20 and 30 minutes. Distance, real or perceived distance, is a barrier for walking (Krizek et al., 2009) and is one of the key factors influencing the choice of walking (ITF, 2018; Adkins, et al., 2012; Greenwald & Boarnet, 2001; Handy, 1996). However, it is not easy to determine what is the acceptable distance to walk because travel distance is also dependent on the age, physical conditions, the state of the pavement, and urban environment, but mainly on the size of the urban centres (Gelh, 2014).

In the last decades, the design of the city, the public space, and the location of activities have been done with a car-centric planning, which has resulted in a greater consumption of land and energy, causing problems in the environment and inaccessibility to many sectors of citizenship. Some urban planners focus their interest on density but forget to change diversity and design (Cervero & Kockelman, 1997).

To change this trend, urban planning is essential and must avoid the monofunctionalism of urban areas, promoting the balanced diversity of the main functions of the city such as living, working, shopping, recreation and education (Paroah, 1996). This is so called 'proximity urbanism', which creates proximity and autonomy.

As seeing above, walking varies a lot depending on the trip purpose (Tolley, 1990; Monheim, 1979). Proximity to employment is the variable that most influences travel distance and modal choice, rather than the existence of commerce and services in the residential area (Cervero & Radisch, 1996; Gainza & Etxano, 2014), especially among women (Cerin et al., 2007). Furthermore, proximity to destinations is the element that most positively influences walking as a mode for nonrecreational travel, more than aesthetic quality, infrastructure, or security (Saelens & Handy, 2008; Cervero & Duncan, 2003).

Less intensity of urban activity implies a greater use of the car and vice versa (Litman, 2019; Newman & Kenworthy, 1989).

There are multiple factors that influence walking. The following is a brief selection of them built upon the impact on the individual places and infrastructure related to walking.

2.1. Pedestrians individual

The individual decision to walk is not only conditioned by personal needs, but several different factors interfere in personal choices and attitudes (ARL, 2016). The walking behaviour is very different among the age and life-cycle stages (Van der Hoorn & Van Wee, 2013, Pozueta, 2007), social status –education level and household characteristics-, gender, (Tolley, 1990), the perception of safety and security, etc. However, income, travel time, and transport costs (in terms of individual expenditure on transport), influence on the choice to walk or not; or pedestrian travel habits are influenced by cultural factors such as societal values (ITF,2012). For instance, in southern European countries, walking ‘is part of the lifestyle, is a basic aspect of daily life’ (Lamíquiz, 2011).

2.2. Places where people walk

More than two-thirds of the European population live in urban areas and they continue to grow: by 2050, 82% of Europe’s population will be urban (European Union, 2011).

This opens a large field of action for pedestrians, above all in many small and medium sized cities. The bigger the city, the more complex the trajectories and the longer the distance. In Spain, according to the Metropolitan Mobility Observatory data (OMM, 2017), small areas have the highest percentage of walking and cycling, followed by large areas and medium ones, as it can be seen in Table 1, by purpose of the trip (obligatory or non-obligatory mobility) and in the main cities:

	Large areas*			Medium areas**			Small areas***		
	Obligatory	Non-Obligatory	Main city	Obligatory	Non-Obligatory	Main city	Obligatory	Non-Obligatory	Main city
Walking & cycling	22,4	47,5	**49,9**	25,3	47,1	**49,5**	24	54,9	**51,9**
Public Transport	19	18	23,1	11	4,7	14,6	9,1	10,4	10,4
Car & motorbike	57,9	34,1	25,8	62	47,2	34,6	66,2	34,2	37,1
Others	1,3	0,9	2,8	1,8	2,7	1,7	1,6	1,7	1

* 7 large metropolitan areas: more than a million of inhabitants
** 7 medium metropolitan areas: more than 500.000 inhabitants
*** 8 small metropolitan areas: less than 500.000 inhabitants

Table 1. **Modal share in Spanish cities. Source: OMM, 2017**

Compact areas can reduce the number of motorized trips and boost the nonmotorized ones (Cervero & Kockelman.,1997), especially for non-work trips. By contrast, sprawl, as the physical pattern of low-density expansion of large urban areas, is one of the major challenges facing urban Europe (EEA, 2006). Sprawl has an "unmistakable and profound influence on travel" and makes public transport services in good condition (frequency, number of lines, etc.) unviable and increase the use of cars. This situation generates the growth of vulnerable population groups that live in the periphery and have to travel great distances (UN- Habitat, 2013).

Moreover, the urban structure and its subsequent transformation by planning have a great influence on human behaviour and the way the city's function (Gelh, 2014). There are some good examples of old compact urban structures with quality urban spaces resulting in lively streets, such as Barcelona, Copenhagen, or Paris. Some street layouts are preferable to others. "*Most old cities have a complex and fine-grained street pattern and that makes them more interesting*" (Hass-Klau, 2015). It can be said that people living in areas with dense, mixed-use, integrated buildings, and with good access to public transport are more likely to walk (City of London, 2018). Moreover, Cervero & Duncan (2003) highlight that urban design influences the choice of walk: curved and cul-de sac street layouts discourage walking. On the contrary, well-connected streets, mixed land use, and small blocks favour short distances and walking.

Rarely in the literature, the data of pedestrian mobility distinguishes among central, inner, or outer cities, and the difference in modal distribution in different parts of the city can become notorious. For example, walking is the most common mode of transport in central and inner Madrid by 40% and 32%, but this percentage decreases by 29,2% in the outer cities (Consorcio Regional de Transportes Madrid, 2020). London strategy outlines different approaches for central, inner, and outer London, where 41% of all trips are made on foot in the central and inner cities and 29% outer (City of London, 2018).

Additionally, the existence of a larger metropolitan area greatly influences the modal shift. In Spain, in cities with less metropolitan development, the percentages of trips on foot are generally higher (Sanz, 1998). For example, the city of Vitoria Gasteiz does not have a metropolitan area and it has the highest walking modal share in Spain. Ewing (2005) found a strong correlation between metropolitan development patterns and walking.

2.3 Infrastructure for walking

Nowadays, the sheer scale of many cities makes a multimodal system necessary, since the majority of the trips require the combination of several modes (Southworth, 2005).

However, *walking is a key element in most multimodal trips* (ITF, 2012) and may be more important than it seems. Likewise, a critical factor supporting walkability in larger cities is accessibility to public transport for longer trips and it is necessary to improve the connectivity and ease of transfer between modes (ITF, 2018; Krizek et al., 2009) and to see if public transport services can be reached on foot (Paroah, 1996).

Any increase in transport modal share is because there is a shift to another mode (Paroah, 2003). In most cases, cycling increases at the expense of walking (Krizek et al. 2009); motorised modes at the expense of nonmotorised modes and public transport at the expense of private transport (Werner et al., 2003). The challenge is to shift users away from the car.

Good walking conditions are considered the following five ‘Cs’ (Paroah, 1996): i) Connected: in a comprehensive network, with short street blocks instead of less permeable large blocks (Pozueta et al., 2013). ii) Convenient: with direct routes without detours. iii) *Comfortable*: adequate surface and pavement, enough widths, non-obstacles, with good lighting. iv) *Convivial*: diversity of public spaces to stay and mix of buildings and activities. v) *Conspicuous*: clear routes in terms of design and signing.

There is no defined average distance to walk. The radius of action of a walking trip, taking as a reference the travel time between 20 and 30 min, is between 1.5-2.5 km. (Pozueta et al., 2013), but to spend a great value of time is often a reason against walking. It is considered as a means of transport that takes a longer time, compared to other mechanized modes (Goodman et al., 2003). The walking speed is also one of the main conditions against other modes, since it varies, under normal conditions, between 4- 5 km/h. Other factors influencing walking speed are the quality of pedestrian facilities, the age and physical state of the pedestrian, the crowd on the streets, or the weather (Gehl, 2014). Improving the quality of the infrastructure, e.g., to include more footways, provide wider pavements with smoother surfaces, making walking spaces more enjoyable (ITF, 2018), and prohibiting cyclists on pavements, have a positive influence on walking (Walcying, EU Project). Providing more infrastructure may not in itself change behaviour.

One of the most important measures is to reverse the hierarchy of public spaces (Government of the Basque Country, 2016), to put pedestrians in the first place and bring them the best conditions to walk. Likewise, 'intermodality spaces' are convenient if it is possible to share the space by different means of transport. The 'coexistence' between modes is a matter of speed and it would be possible, but not under spatial equality conditions (Gehl, 2014; Monheim, 2003) because it depends on the volume of car traffic, not above 250 cars/h, or either on the speed of cars between 10km/h and 20km/h.

3. POLICIES AND STRATEGIES FOR ENCOURAGING WALKING

Several cities have opted to promote pedestrian mobility, with different purposes such as: for reasons of the health of the population (improving the health of citizens and preventing diseases); for a first step for a mind shift by urban development model on a human scale and proximity; for a requirement to be another means of transport and highlight its importance and benefits, etc.

To establish some principles or objectives, strategies or plans for walking have been launched at different levels, mostly at the city level, but there are also examples at the regional (e.g Scotland) and national (e.g Norway) level. Table 2 shows some selected examples, indicating their main objectives.

Country/Region/ City	***Strategy/Plan***	***Main goals***
City of London (2018)	Walking action plan. Making London the world's most walkable city	i. 80 per cent of all journeys to be made on foot, by cycle or using public transport by 2041. ii. Londoners have to do at least 20 minutes of active travel every day by 2041. iii. Efficient use of street space, improving the experience of walking on London's streets.
Paris (2017)	Stratégie "Paris piéton"	i. Facilitate pedestrian continuity and new sharing of the road. ii. Promote the diversity of street uses. iii. Raise the comfort standards of public spaces. iv. Rethink the orientation of pedestrians. v. Consolidate the pedestrian culture of Paris.
Scotland (2014) Scotland launched in 2003 its first physical activity strategy 'Let's Make Scotland More Active' (LMSMA).	Let's Get Scotland Walking The National Walking Strategy	i. Create a culture of walking where everyone walks more often as part of their everyday travel and for recreation and well-being. ii. Better quality walking environments with attractive, well designed and managed built and natural spaces for everyone. iii. Enable easy, convenient, and safe independent mobility for everyone.
Norway (2014)	The Norwegian Walking Strategy: "Walking for life"	i. Walking should appeal to everyone. ii. More people should walk more.
City of Copenhagen (2007)	More people to walk more. The pedestrian strategy of Copenhagen	i. 20% increase in pedestrian traffic by 2015 compared to 2009 ii. By 2015, Copenhageners walk 12 minutes a day

Table 2. Walking strategies.

The most effective strategies for encouraging walking seem to be "those that are multidisciplinary and include a mix of top-down and bottom-up approaches with buy-in from government and non-government organizations, academic institutions, professional and commercial groups, and passionate citizens" (Walk21, 2017), in short, when they involve all stakeholders of the city.

Some existing strategies (e.g., Scotland) not only establish measures that promote walking, but also connect sectoral policies with each other (for instance, health, transport, urban planning, environment, social, etc.), achieving a comprehensive approach that reinforces each action, and across a range of policy areas at national, regional and local levels (Government of Scotland, 2014).

4. PULL AND PUSH MEASURES FOR INCREASING WALKING.

Before any intervention or action, each city must make a careful diagnosis and it would be wise to start by asking why people do not walk, as London did when it developed the walking strategy. The main reasons they found were: i) time to spend in travel (24%); ii) high traffic (21%); iii) personal security (20%); iv) other travel preferences (18%); v) bad pedestrian facilities (14%); vi) not being fit enough (14%); vii) safety and fear of traffic (12%); viii) having a disability and the state of pavements (10%) (City of London, 2018). If policy makers do not know how people move, it is very difficult to be efficient in the management of measures.

Pull measures to increase walking refer to all incentives that discourage some attitude or habits and promote a modal shift. In this research, it concerns deterring strategies that discourage driving. On the other hand, push measures are considered as enabling strategies (policy, infrastructure investment, or actions) that boost walking (Piatokowski et al., 2019).

Nevertheless, push measures for sustainable modes such as walking, which is necessary but not sufficient to extend a sustainable urban mobility model (Sanz, 2007). Piatkowski et al., (2019) in their study in 4 American cities in which they carried out the *Non-motorized Transportation Pilot Program* revealed that establishing a joint action between actions that boost active transport (push measures) and those that discourage car use (pull measures) is more effective than doing them separately.

They also point out that attention must be paid to the measures applied to deter driving because they can harm the promotion of walking, so it is not only necessary to be careful when carrying out the intervention but also the capacity to implement it.

Combining measures can cause nondesirable effects such ‘Suction effect’, but between sustainable modes instead of subtracting the car, for instance, a new policy that promotes scooters can attract people walking; or ‘Rebound effects**’,** for example, measures that improve the environmental effectiveness of a vehicle also translate into greater use of it; or ‘migratory effect’, the application of measures in the inner city, for example a streets pedestrianization can drive traffic to edge areas (Sanz, 2007).

There are countless of measures to act on, but not all measures are the same in terms of magnitude.

For instance, ‘hard measures’ (big investments in more convenient crossing and redesigning intersections for pedestrians, renovation of the urban streetscape, park & ride outside the city centre, etc.) or ‘soft’ measures like information and promotion campaigns etc. Although it may happen that ‘soft’ measures can enhance the effectiveness of ‘hard’ measures (W21, 2019). Table 3 presents a review of pull measures and Table 4 push measures, both used in walking policies and strategies.

	Type of measure	***Example***
Pull measures	*Car traffic restraint*	Creation of a traffic control center by the city council to give preferential pedestrian use in the centre
		Reducing the speed of vehicles
		Reallocating road space, reducing road space.
		Targeted restrictions on vehicles better than a simple ban
		Parking duration and parking turnover
		Reduction of search traffic
		Car limited zones
		Decrease parking spaces
		Ban pavement parking
		Parking charges
		Park & Ride outside the city centres
		Parking penalties for improper parking
		Permanent or time-of day car bans
		Congestion management
	Road safety	Reducing speed, reducing accidents & injuries
		Separate cycle path from footpath
		Crossing at street levels (no skywalks & subways)
		Reduce road danger
		Speed humps in the carriageways
		Traffic calming: 30 km/h, 20 km/h or 10 km/h
	Enterprise and trip generation pole Coordination:	Promotion of shoft mode of transport to access at work
		Support staff to change employee’s mobility patterns
		Change bonus ‘company cars’ for other economic or tax incentives
		Teleworking or desksharing schemes
		Shuttle bus lines to the main transport nodes of the city. Connect the main attraction / generation points to all the transport networks
	Public transport	Providing convenient, punctual, frequent, and well-connected public transport systems
		Attractive pedestrian connections
		Placing bus stops at shorter intervals
		Improving security and accessibility to the most vulnerable groups: elderly, children and those with mobility constraints.
		Transport mode transfers simple, quick, efficient, safe and confortable

Table 3. Pull measures to encourage walking.

	Type of measure	*Example*
Push measures	*Improving environment for walking*	Pavements fit for walking
		Increase the width of pavements
		Better lighting, with priority to pedestrians
		Construction and improvement of side walks
		Street furniture well placed
		More convenient crossing: redesign the intersections for pedestrians
		Better signing
		Making more attractive places for everybody
		Removed obstructions and obstacles
		Walking routes were clear, connected and well signposted
		Flush dropped kerbs
		Increase the frequency of pedestrian phases in the traffic light cycle
		Removal barriers for disabled people
		Improvements in public spaces: sidewalks, terraces, outdoors activities: cultural, animation, ephemeral art installations, artist and street performers
		Prevent invasion of sidewalks by parked cars or bikes or electric scooters
		Protection from inclement weather
		Avoid elevated and underground pedestrian crossings
		Green and nature in the streets
		Publish walking route maps
		Technology like apps and devices will play an important role in the walkable futures of cities
		School pedestrian routes
		Footway free from litter and dog mess
	Land use planning	Integrating walking into transport and land use planning
		Pilot projects school streets with timed road closures
		Minimise the need to travel
		Improved retail vitality
		Promotion of mixed-use neighbourhoods
		Increase density
		Activity in the ground levels of buildings walls
		Street markets.
	Promotion campaigns The most effective campaigns are those that combine information, education, service developments, legislation and changes to the physical environment (Tolley, 2003).	School mobility programs
		Leisure walking routes
		Information, awareness and communication Campaigns
		Supporting a culture change

Table 4. Push measures to encourage walking

Hereafter, the Spanish city of Pontevedra has been chosen as a case study to analyse push and pull measures for increasing walking in cities and their combinations, because it is considered a word reference for the success in the implementation of the measures, are more focused on enabling (push measures) strategies than on deterring strategies. In addition, the passage of time allows to evaluate the results after almost 20 years of action.

5. RECOVERY OF THE CITY FOR PEOPLE: THE CASE OF PONTEVEDRA

Pontevedra is a small city in Galicia, the capital of the same name province, with a population of 83,209 inhabitants in the capital and 945,408 inhabitants in the metropolitan area. It is located on the Spanish northwest coast.

In 1996, the city monitored the traffic situation (The traffic in the centre of Pontevedra was three times greater than the traffic intensity in the centre of Madrid and 5 times greater than in the centre of London, 74,000 cars entered in 5 km2), which had an impact on poor air and life quality for citizens, the city council decided to carry out an urban reform for improving the quality of the environment for people living, both in regulation and design.

Local authorities analyzed proposals made in other cities to reflect upon what might or might not work as following: congestion charging, improvement of public transport, pedestrianization of the city centre, traffic calming, traffic restrictions on the appearance of license plates, crossings at high or below levels like skywalks and subways, etc.

While most cities focused on trying to solve the problem of urban traffic (pull measures), the actions taken in Pontevedra focused on recovering the city and public space for people (push measures). The city council tried to influence any potential side effects in a positive way rather than negative.

5.1. Pull and pull measures

The decision was made to reverse an unsustainable traffic situation and poor urban quality, and it was important to properly select the measures so that they would be effective from the beginning because any mistake would put even more against the sectors most sensitive to change.

In order not to delay the transformation, it was decided to start acting and in turn adapt the Sustainable Urban Mobility Plan (SUMP), since it had previously been studied in depth what and how to do it. It was a participated and consulted process. The main measures were basically implemented in 4 scopes (Concello de Pontevedra, 2016): i) pedestrian priority; ii) accessibility; iii) drastic reduction of traffic in the city; iv) road safety. Figure 1 shows various actions carried out in Pontevedra during the period between 1999 and 2015.

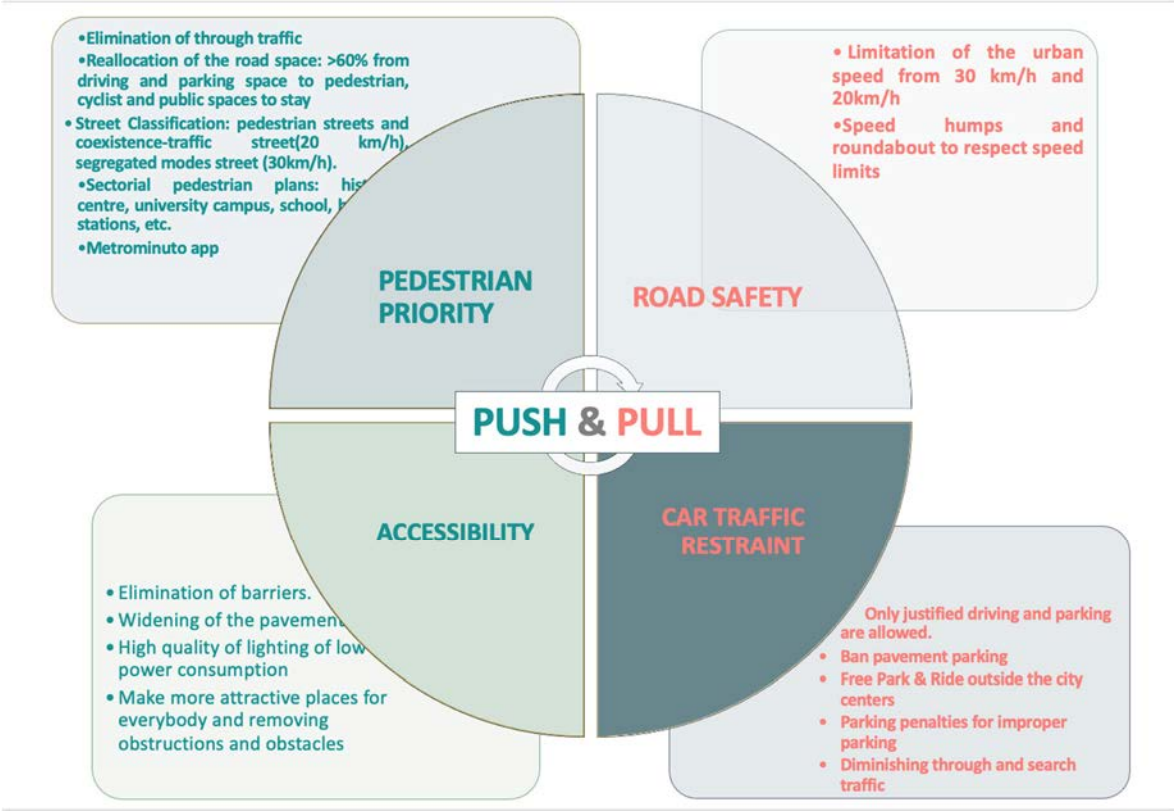

Figure 1. **Pull and push measures applied in Pontevedra (1999-2015).**

Once the implemented measures have been shown, the foremost results are presented below.

5.2 Main outcomes

It can be said that Pontevedra recovers the city for the people for several reasons. First, because the space for cars was reduced to give it to the pedestrian, the ratio was changed from 75-80% for cars to 75-80% for the pedestrians; cars are not prevented from entering the city, but through-traffic is gradually being excluded from the city centre (30% of vehicles); residents and various necessary activities that generate traffic are allowed such as: loading and unloading, access to garages, messaging, public transport and private services (with a maximum of 15 minutes of parking); pedestrianization actions were jointly carried out with cultural actions and events; underground car parks have been increased and since 2010, the speed has been reduced to 30 km/h throughout the municipality; and universal accessibility has been achieved throughout the public space, getting a safe public space, and where children play in the squares and go to school alone. Consequently, in 9 years, accidents have dropped to 0 and air quality has improved and is within WHO limits.

Additionally, the city has a parking system in which free spaces are contemplated to carry out small errands, free parking on the urban edge, and rotating paid parking lots throughout the city.

It is important to ensure that the benefits of change are noticeable. It seems that this has been the case because citizens are proud of their city and the population has been increasing. Decision-makers believe that the success was due to several factors (Concello de Pontevedra, 2016): i) a strong will to achieve the objectives: public spaces for all, accessibility for all; ii) starting with a phase of deep and conscientious reflection on how to act, learn from the successes and errors of other cities and permanent collection of information; iii) comprehensively understanding decision making on the urban space as a whole; iv) global solutions of overall problems instead of isolated and small actions, with imperceptible outcomes; v) outline the actions specifically for each neighborhood or urban area vi) successful political and inter-administrative coordination; vii) weighted use of the car reasoned and optimized, with the consequent change of habits. The car is used only when active modes are not competitive; viii) traffic reduction measures are gradually more intense in the centre than in other parts of the city (in 18 years, a third of the traffic in the center has been reduced); ix) overcome opposition through good information; x) instead of doing a few big festivals or events, more small and diverse actions were carried out in the streets contributing to an improvement in the quality of life for citizens.

6. CONCLUSIONS

A favorable way to reduce the pace of modern urban life is to design cities at human speed, moving at the pace of the person but not the car. Pedestrian mobility adds multiple benefits, first for the individual: it is healthy, it is active, reduces the level of stress and allows him to perceive more details through the human eyes, and normally, it increases the sense of belonging; secondly for the environment: it contributes to reach clean air, it is noiseless, takes up less space than any other mode of transport and no vehicle or device is needed to move (except disable people) and finally, pedestrian infrastructure or facilities are affordable than any road or rail infrastructure.

Reclaiming space for the pedestrian means taking it off to another mode, mainly to the car. This does not mean to ban cars, but to use them only when it is necessary and sustainable modes are not competitive. Initially, it may be an unpopular measure and less impressive than the inauguration of an infrastructure. That is why courageous politicians are needed to push for a more humane urban model and they who know how to achieve it.

Although an important variety of measures has been presented, unfortunately each city must contextualize and find its own way to establish which are the most appropriate combination of measures and how to succeed in their implementation.

It is not a matter that is achieved in the short term, not in one stage. A global action is more efective than the sum of isolated actions. As has been seen in the city of Pontevedra, the combination of pull and push measures maximize the benefits of both.

It is advisable to prevent possible side effects between measures and a different approach in different parts of the city. New projects need to be designed according to the unique urban areas, and for different cycles of life and groups of age (children, youth, older) adapting the concept aforementioned of ‘smart mobility’. In addition, it will be a form of not only to establish measures that promote walking, but also to connect sectoral policies with each other (for instance, health, transport, social and cultural, etc.). Thus, the transversal organization of mobility in the administration is desirable and it contributes to a comprehensively understanding of mobility.

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