

## Planning policies in municipal mobility plans

### 1. Context to the elaboration of the Mobility Plan

The present Project consists of a Mobility Plan (MP) for the city of Vila Nova de Famalicão (VNF), as part of the Sustainable Mobility Project (SMP), an initiative of the Portuguese Environment Agency. To participate in this Project 40 running municipalities were selected. A net of University Centers was responsible for the elaboration of the MPs. VNF case was carried out by the Planning Laboratory of the Engineering Faculty of the University of Oporto, along with other five municipalities most of them from the North Region. The process of elaboration of the MP included several meetings with the Department of Urbanism of the Municipality and the contact with Agents of the Transport Systems, for example, in order to understand expectations and to collect information to complete a diagnosis of the mobility conditions in VNF. The objectives draw by the team address i) the improvement of the accessibility of jobs, schools, trade and services by more sustainable modes; ii) the improvement of the quality of the environment and the public space; iii) the conditioning of trips by car and therefore the reduction of its weight in the modal split, this should be done either by interventions in the infrastructure either by changes to the provision and to the management of car parking. For the SMP, and given the scarce resources and short duration of the project, it was chosen to target interventions to specific problems of the municipalities, trying to make concrete proposals, feasible and that would contribute to the concept of sustainable mobility that it aims to implement.

### 2. Diagnosis main issues

A diagnosis of the mobility conditions was elaborated focusing on four areas: 1. Territory and activities; 2. Travel patterns; 3. Infrastructures and transport services; and, 4. Circulation conditions. Within the point 1 the land use and the green network were considered as well as the social-economical dynamics and the most important traffic generators. The point 2 dealt with the municipality outer and inner connections and the mobility patterns of the population (times and distances). The third point of the diagnosis focused on the infrastructures and the various transport systems' description. Finally, the conditions of circulation (point 4) of the pedestrian, the public transport and the car were analyzed, so were the parking system and the road safety. From this diagnosis a swot analysis (Tab1) was completed in order to summarize some conclusions.

<b>Strengths</b>	<b>Weaknesses</b>
Good road and railway infrastructures	Part of the area with sharp topography
Good territorial coverage of the public transport systems	No information in bus stops
Urban renewal processes	Frequency and time travel of the public transport routes
	Distances between the public transport stops
	Lack of a parking strategy
<b>Opportunities</b>	<b>Threats</b>
Urban renewal processes	Territorial urban sprawl
Young population	Pressure of the rural and expansion areas on the core
Demographic growth	Lack of alternative to the car
Demographic concentration process	

Tab.1 Swot analysis

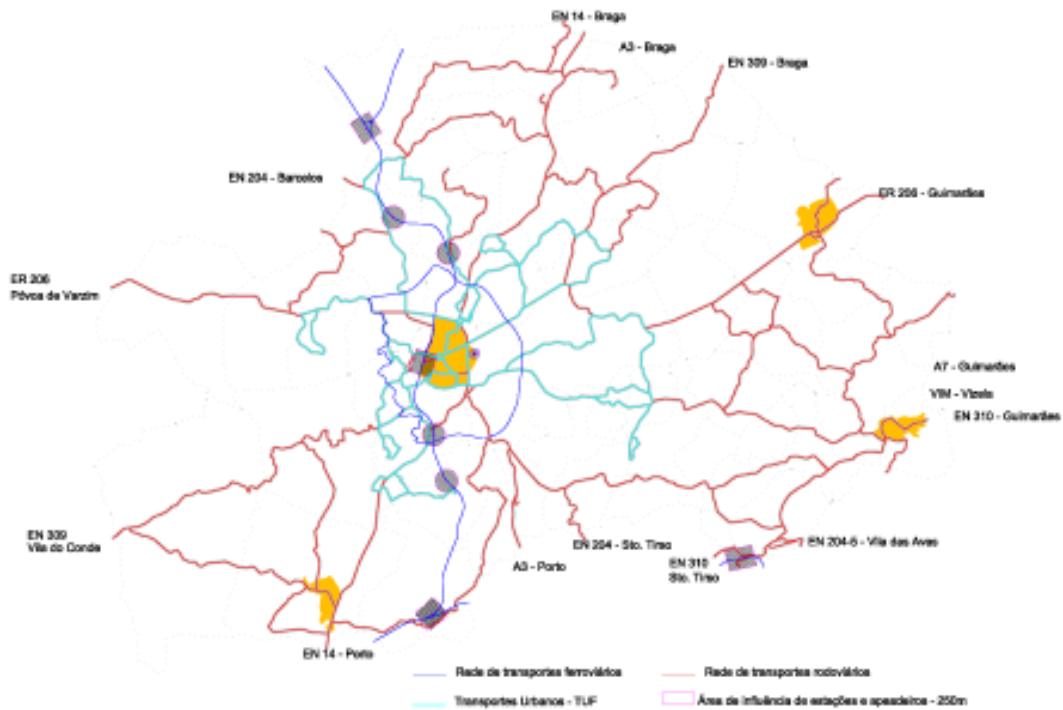


Fig 1 Transport infrastructure network



Fig2 Urban renewal in the city centre



Fig3 No shelter or information in Bus stops



Fig4 Lack of a car parking strategy

Freguesias	Perimetro 1981	Perimetro 1991	Perimetro 2001
Antas	3275	4159	4665
Brufe	1964	1864	1755
Calendário	5002	6000	7725
Vila N. Famalicão	4036	5243	8098
Gavião	1388	1304	1566
Louro	46	42	45
Reguião	32	39	42
<b>Total</b>	<b>15743</b>	<b>18651</b>	<b>23896</b>

Tab2 Demographic concentration

### 3. Urban form and mobility conditions

VNF is located in the North Region of Portugal, about 20km northeast of Oporto. It is a municipality with around 135 000 inhabitants, from which only 24 000 live inside the urban limits of the city, which correspond to limits of the studied area. This territory is still in

expansion and it is characterized by sprawl urbanization with linear development along the road infrastructure around a consolidated nucleus where the main facilities are located. It is an area characterized by low density of population, where the single family house is the dominant typology (Fig5), situation that results in low levels of demand for collective transport systems. The car is by far the elected means of transport for the daily and occasional trips. This scenario changes in the particular case of the elderly population, which has a smaller rank of choices and is an important part of the population of these areas. Furthermore, the necessary urban expansion often results in the construction of apartment blocks, in areas close to the city limits but included in rural areas, leading to a population peak (Fig6). The families occupying these new developments have different needs in terms of mobility, particularly in comparison with an aging population, and represent a localized pressure on the transport system infrastructure. However, this peak doesn't reach the minimum level that justifies an investment in terms of provision of public transport. In a territory as the studied one, the distance makes the awareness of the use of soft modes sometimes disproportionate. The dependence of these areas of the car causes a serious pressure on the consolidated urban core, on which they depend largely for the consumption of goods and services. Resolving the car pressure in VNF demands the management of these areas of expansion that are within the limits of the urban perimeter, creating areas of priority of occupation, through appropriate tools such as development plans, thus, filling the urban voids and accelerating the consistency of these areas of expansion. These areas could then reach levels of density that would justify an overhaul of the public transport system to provide a more suitable and sustainable service.



*Fig5 Typical rural environment*



*Fig6 Recent real estate development*

#### **4. Concept of intervention**

The options of the MP were defined a priori having accompanied and orientated the diagnosis elaboration. The MP should maximize the use of soft modes and the strengthening of the public transport system, obviously working to reduce the dependency of the municipality's trips on fossil fuels and to reduce the transport share in the carbon emissions. The objectives already referred in the introduction based the three fold concept of intervention:

- a) Car parking and the organization of trips;
- b) The pedestrian and bicycle networks and the control of the car pressure;
- c) The public transport system service and the quality of the waiting times.

For each of these key questions objectives and methodologies were also defined. Four objectives are common to the three key questions:

- i) Improvement of the urban environment, quality and safety;
- ii) Reduction of the trips by car;
- iii) Increase of the quality of the connections between different modal networks;

- iv) Improvement of the system of information to the public.

## **5. The proposals and the actions**

### **5.1 Pedestrian network**

The pedestrian circulation conditions in the city are quite good so that the actions proposed are related to specific problems that can be solved based in solutions of good practice of urban design. Suggestions were also made concerning the exaggerated wideness of some avenues that are part of the main circulation network, which in our opinion work as an urban barrier. Their rehabilitation through landscaping and urban design is also recommended, thus reorienting and reducing the crossing traffic and improving the urban cohesion. Measures to reduce the speed of circulation were also described as well as aspects related to the illumination of the streets and other public spaces.

### **5.2 Bicycle network**

A characterization of the conditions to introduce bicycle lanes was carried out. This included the survey of the inclination of the streets, their pavement materials, the number of parking places offered, etc. This information was then crossed with spatial demographic data produced and spatial distribution of the main facilities. A bicycle network was proposed (Fig7), to be implemented in 3 phases, taking into account the objectives of the bicycle network and the necessary investment. The bicycle network primarily connects all schools with areas where the density of teenager and elderly population is higher. Then it links the main facilities and shopping areas in the city and finally connects all the areas with higher density of residents. It is also linked with the leisure bicycle lanes that already exist and that have an inter municipal character. Usually the option for a route is connected with the proposals made for the intervention in some streets that don't have an adequate geometry for a satisfactory urban integration. Considerations were also made concerning safety and bicycle parking conditions.

### **5.3 Interface of public transports**

We proposed the relocation of the Bus Station to a site near the Railway Station (Fig8). The physical proximity between the two equipments optimizes the functioning of both transport systems served, coupled with the implementation of a Park and Ride. This proposal cannot be detailed in this Project, but it is important that this idea and principle of intervention is made clear in the MP. The complementary timetables and destinations thus offered plus the real possibility of passengers transfer is significant for increasing the quality of transport services as the user sees the possibilities of trips increased. The service quality of public transport and the loyalty of users are connected not only to the quality but primarily to the real possibilities of mobility offered, ie of frequency. This intervention might also define the urbanization in this area, laying the groundwork for the consolidation of this area of the city.

### **5.4 Service of the public transport system**

In a small town, where the network establishes the connection between city and rural settlements, the quality of the waiting time is very important for quality of the trip. The reason is, essentially, due to low frequency applied in this type of connections, intra urban character, which leads to increased waiting times of passengers. The function of the shelter is to provide equipment that allows a comfortable waiting. The shelters must also meet the needs of comfort while waiting, such as seats. Another aspect that improves the quality of mobility of users of public transport is the access to information. It is essential for the loyalty of clients and to gain new users. Another suggestion was a web site which would act as a platform for

information on the various transport systems that operate in the city. This internet site would provide information on the possibilities of transport in VNF, by operators of public transport. This page should also include information on pedestrian and bicycle networks. It should also be possible to register complaints and recommendations, as well as notification of any act of vandalism committed to any equipment of the different networks.

### **5.5 Car parking lot**

A system of peripheral parking lots located on the edge of the consolidated city was proposed (Fig9). This system allows the drivers to park the car and walk to their final destination at a maximum distance of about 600 meters or seven minutes (distances and travel times to the main services and facilities were considered). The main objective is to remove the long time parking from the central area, keeping the area for parking of residents and short time parking. All parks in this system are free of charges. The success of the system depends on a tariff policy that does not leave doubts about the choice for peripheral parking lot whenever the duration of the activity is long. The implementation of this system implies some actions, such as, the closing of the central parking lot and its reconversion into a green area; the construction of the car parking area next to the Municipal Library, and the rehabilitation of the other Parking areas, with respect to landscaping and pedestrian paths, both within the Parking area and in its connection to the city. This system would have to be accompanied by the installation of an information system in several points of the city (Fig10). The implementation of this system should be simultaneous with the implementation of measures for the street side parking.

### **5.6 Street side car parking**

The proposal for street side parking distinguishes two groups of users: residents and visitors (regular or occasional). In developing this proposal, the area was divided into two areas of study, covering the solutions to the central area, since the surrounding area has no serious parking problems. The tariff policy should be more severe in the inner ring than in the outer ring, but both rates should be subject to a rate that increases with time (Fig11). That is, the hourly rate for a car parked for 15 minutes should be less than the hourly rate for a car parked for two hours. Other actions with a more specific character were also proposed. Measures concerning the differentiation of use and the increase of parking places of the two car parking areas serving the Railway Station were proposed. The area where the Weekly Fair occurs is also used as parking during the rest of the week. It is suggested to use a vacant space nearby the Fair for different uses throughout the week. Every Wednesday, this site would only be accessible for parking and the remaining days of the week this space could serve as a play and games ground with free public access, increasing the supply of parking only when it is strictly necessary (Fig13).

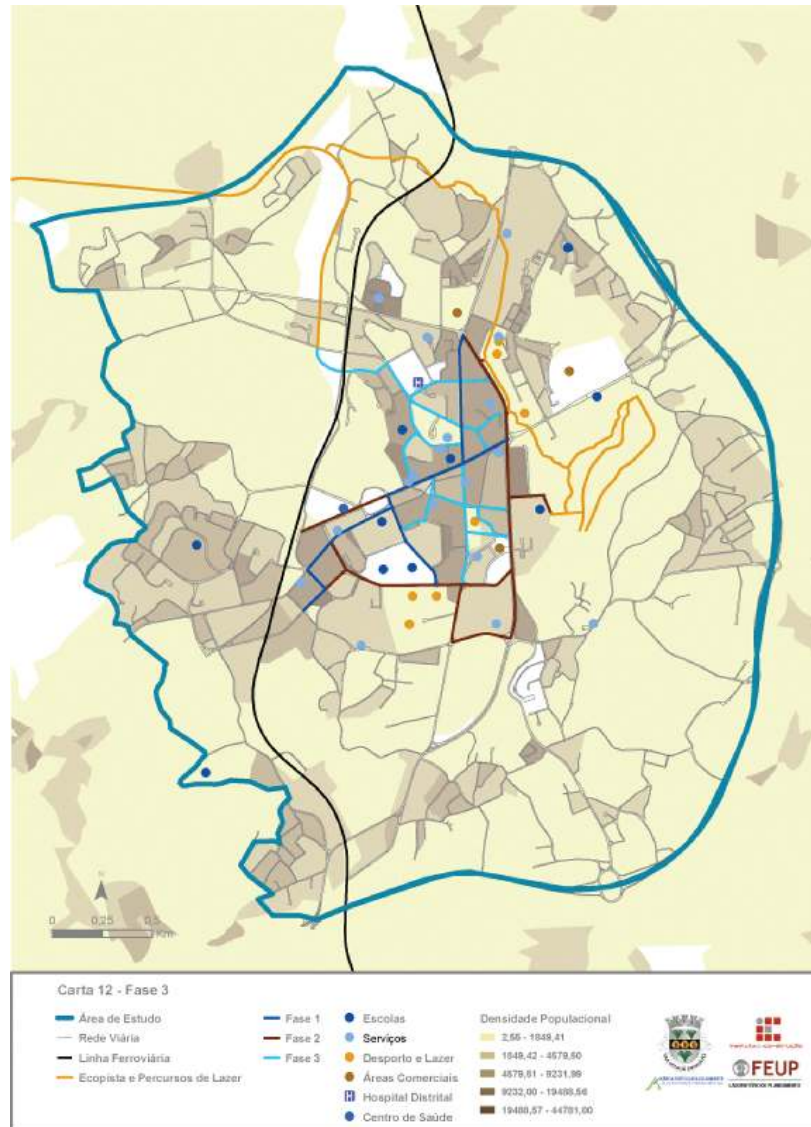


Fig7 Bicycle net proposed in 3 phases of implementation and main services and facilities



Fig8 Relocation of the Bus Station

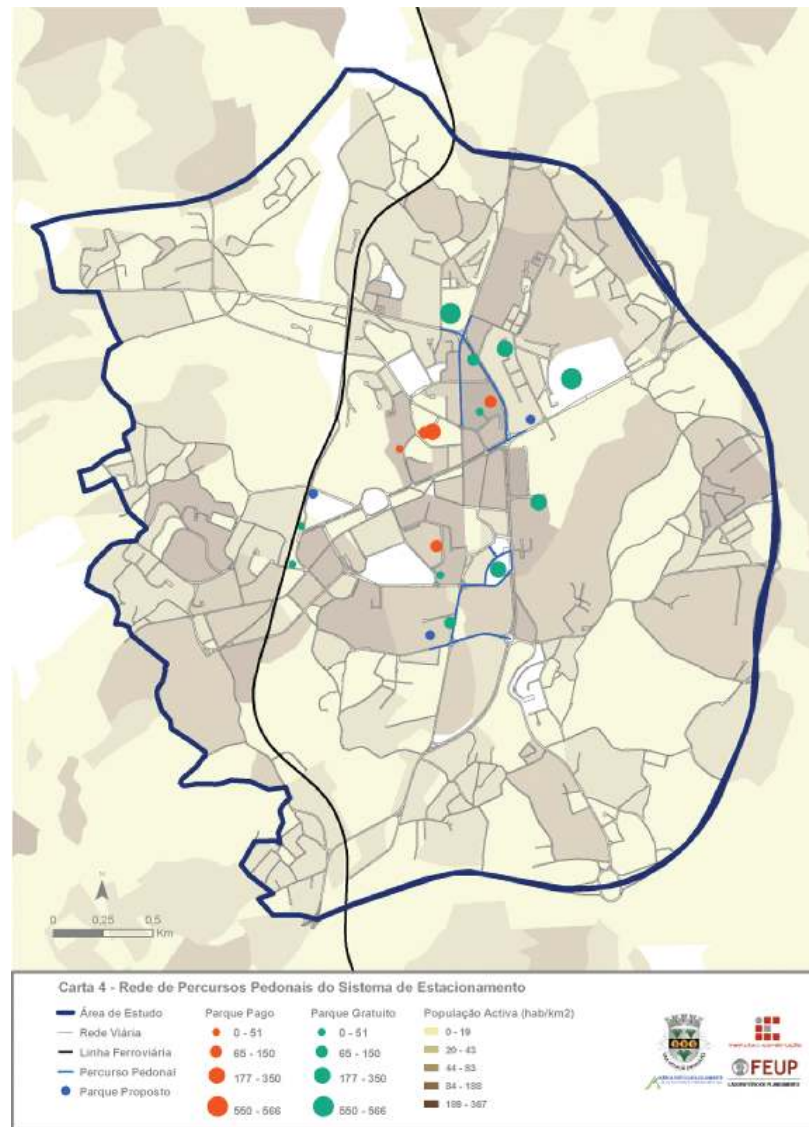


Fig9 Peripheral car parking system proposed with pedestrian connections



Fig10 Location of the information points for the peripheral car parking system

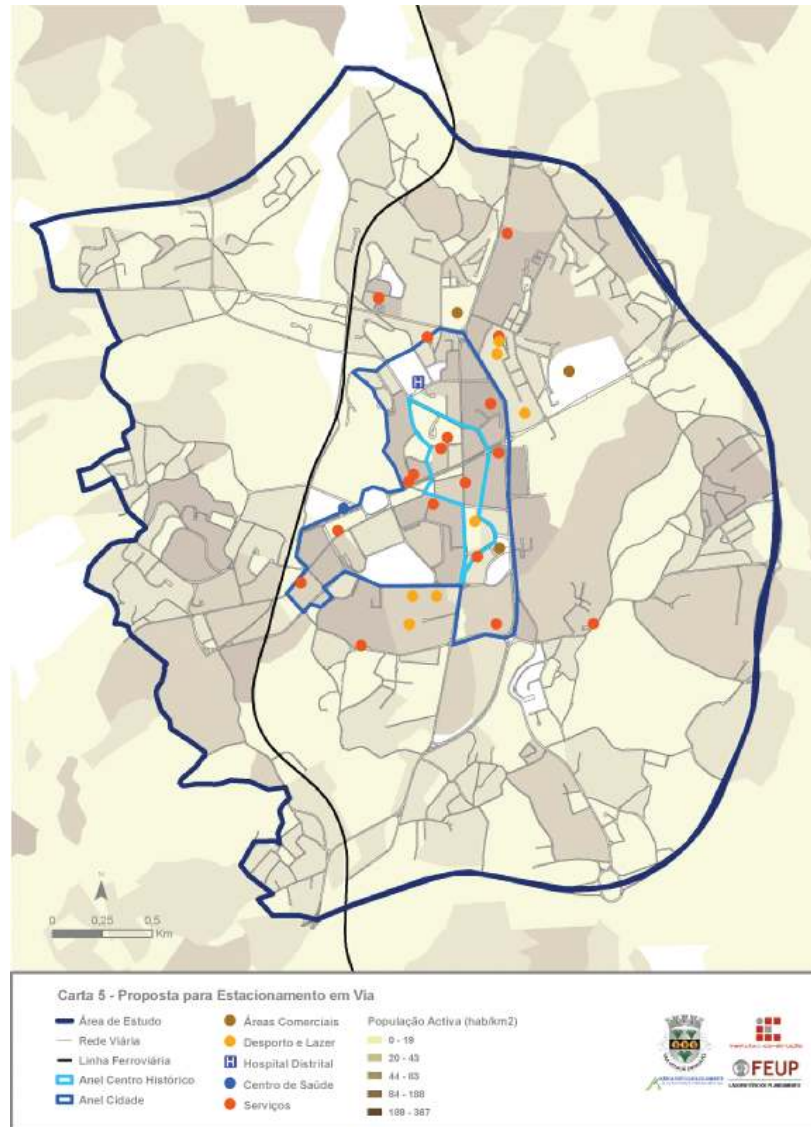


Fig11 Street side car parking tariff zoning



Fig12 Location of the car parking of the Railway Station and of the Weekly Fair.





Fig13 Distance between car parking and the Fair site

## 5. Conclusion

This project had the goal to produce MP in a short period of time providing an overall view of the mobility problems of the Municipality, whether they could actually be dealt within this SMP or not. It aimed to organize a series of integrated actions that should inform how particular mobility problems could be thought and that should become an orientation tool for further interventions, providing the theoretical and methodological framework to support future mobility projects.

## 6. Bibliography

AASHTO (1999) *Guide for Development of bicycle Facilities*, Washington DC: AASHTO.

Ajuntament de Barcelona (2006) *Pla Estratègic de la bicicleta a Barcelona*, Barcelona.

Alves, Mário (2005) *Encorajar o uso da bicicleta: que opções?*

APBP (2002) *Bicycle Parking Guidelines*. Washington DC: Association of Pedestrian and Bicycle Professionals.

Comissão das Comunidades Europeias (2000) *Comunicação da Comissão ao Conselho e ao Parlamento Europeu: Implementação da estratégia comunitária de redução das emissões de CO2 dos veículos automóveis. Primeiro relatório anual sobre a eficácia da estratégia*, Bruxelas: Comissão das Comunidades Europeias.

DiDonato, M; Herbert, S., Vacchani, D. (2002) *City-Bike Maintenance and Availability*. Worcester: Worcester Polytechnic Institute.

Dimeo, F., Tilmann, M., Bertz, H., Kanz, L., Mertelsmann, R., Keul, J. (1997) *Aerobic exercise in the rehabilitation of cancer patients after high dose chemotherapy and autologous peripheral stem cell transplantation*, Cancer, Volume 79(9):1717-1722.

Economic Commission For Europe (2007) *Statistics Of Road Traffic Accidents In Europe And North America*, New York e Geneva: United Nations.

EPA – European Parking Association (2001) *Statement for COST 342*.

Joana Pinho, Planning policies in municipal mobility plans, 45<sup>th</sup> ISOCARP Congress 2009

Eurostat (2007) *Structural Indicators: Environment*, (2007-10-8) <http://ec.europa.eu/eurostat>.

Fietsberaad (2006) *Continuous and integral: The cycling policies of Groningen and other European cycling cities*, Publication number 7, Rotterdam: Fietsberaad.

Gratz, Roberta Brandes (2006) *Downtown parking: It is not as bad as it seems. Downtown Idea Change*, Alexander Communications Group.

Litman, T. (2006) *Parking Management – Strategies, Evaluation and Planning*, Victoria. Canada: Victoria Transport Policy Institute.

Ministerie van Verkeer en Waterstaat (2007) *Cycling in the Netherlands*, Den Haag: Ministerie van Verkeer en Waterstaat.

Osberg, F. e Stiles, S. (1998) *Bicycle Use and Safety In Paris, Boston, and Amsterdam*, Transportation Quarterly. Fall 1998, Volume 52(4):61-76.

Pucher, J. (1997) *Bicycling Boom in Germany: A Revival Engineered by Public Policy*, Transportation Quarterly. Fall, 1997, Volume 51(4): 41.

Restormel Borough Parking Policy. UK.  
(2007-10-12):<http://www.restormel.gov.uk/index.cfm?articleid=4686>.

Robertson, Kent (2005), *Principles of smart downtown planning. Downtown Idea Change*, Alexander Communications Group.

TDM Encyclopedia (2006) *Parking Solutions – A Comprehensive Menu of Solutions to Parking Problems*, Victoria. Canada: Victoria Transport Policy Institute.

(2005) *Transport for London, Cycle Parking Standards - TfL Proposed Guidelines*. (2007-10-12): <http://www.tfl.gov.uk/assets/downloads/Proposed-TfL-Guidelines.pdf>.

(2004) *Transport for London, Creating a Chain Reaction: The London Cycling Plan*. Transport for London. London.