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Evaluation of workplace mobility plans

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Abstract

A new approach is developed to introduce workplace mobility planning. The main goal is to make transport more sustainable through mobility plans created for institutions in specific regions. In order to reach this aim a roadmap has been established, including current situation analysis, collection of mobility incentives, review of the situation of stakeholder involvement and assessment of problems and opportunities of mobility planning. The paper presents the evaluation of workplace mobility planning taking into account several aspects, such as commitment, vision, stakeholder involvement, situation analysis, measures and recommendations. The evaluation covered three institutions in three locations with specific parameters, as size of the city, number of employees, location of the institution in the city and general modal share. In the process several stakeholders were involved using online survey, personal interviews and focus group meetings. Most measures aimed cycling infrastructure development, bike fleet introduction and electric chargers deployment.

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1. Introduction

Sustainable transportation and mobility planning are key issues of transportation planning and policy, thus numerous journal papers [1], [2], [3], [4], [5], [6], [7], studies [8], [9] and books [10] address this topic.

The quantification of the effects due to sustainable mobility plans is analyzed by [11], [12] determines the four main pillars of sustainable urban transport are determined as follows: fair, stable and efficient financing; proper policy for land use and transportation; strategic infrastructural investments; joint planning and development together with the neighbor areas. There is a wide set of applicable policy instruments to influence mobility [13]. At the same

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time, these measures must be continuously adapted to the changes in transport in order to gain public confidence. The applicable policy instruments are grouped by [14] concluding that good results can only be achieved through the mixed use of hard and soft measures. [15] addresses the main questions of sustainable mobility focusing on Paris. The paper also investigates which kind of indicators should be considered for proper evaluation of sustainability.

Another part of the relevant publications concentrate on the transport of a specific area. These papers investigate the recent results of the applied soft incentives. As an example a research [17] assessed the workplace commuting of Luxembourg (where 60% of employees use car) and provided suggestions to influence mode choice. Other [18] studies deal with the influence of land use and mobility policy on travel behavior. The paper gives a comparative case study of Flanders and the Netherlands, which concludes that the adequate policy measures strongly contributed to the recently increased use of sustainable transport modes in Netherlands. Similarly [19] investigates the questions of land-use planning for sustainable transport objectives. The article finds via a Swedish case study that interest groups (with the exception of business representatives) were more aware of the importance of environmental factors and gave these factors greater weight than economic factors. [20] reveal the preferences and trade-offs of residents and employees with respect to location choices and mobility in Munich Metropolitan Region: people generally try to optimize their travel behavior and commuting distances, but are limited due to financial constraints. An interesting analysis was carried out in Perth (Australia) [21] in which health and transport practitioner share perspectives on workplace active travel promotion. The main result of the paper is that parking management is a key action for managing travel demand and behavior change.

As shown above, the notion of sustainability is generally and strongly represented in the European transport policy at European, national, regional and city levels. The White Paper [22] indicates the creation of a new support fund to help the realization of urban mobility plans in European cities. As a part of these actions, activities of cycling organizations have achieved improvements of bike facilities (e.g. lockers, changing rooms, showers) at workplaces. Also, the support of public transport usage has appeared at certain companies. However, most of the workplaces do not have a complex strategy for workplace mobility at the present time.

The aim of the paper is to present workplace mobility plans, which provide sustainable solutions for commuting problems of employees. Section 2 introduces the roadmap for mobility planning and the background of the proposed work. Section 3 gives the overview of the planning method, while section 4 evaluates the planning process considering several aspects, as commitment, vision, stakeholder involvement, situation analysis, implementation of measures and recommendations. The summary concludes the main findings of the paper.

2. Roadmap

As a reasonable answer to the challenges of sustainable transportation in the Central European region, MOVECIT project [23] was launched to introduce a new approach for workplace mobility planning. The aim is to realize a more sustainable transport in times of increasing individual and motorized mobility in city regions. The core approach is that workplace mobility plans are created for institutions, so that they can implement some measures to change the commuting and business travel habits of their employees. Campaigns are developed and launched to make cycling, walking and the use of public transport more popular. At the same time measures like car-sharing, bike-sharing, e-mobility and improved car-pooling are introduced in selected cities.

The project seeks to reach a wide audience among municipalities across Central Europe, creating a large-scale impact and in the long term ongoing training on workplace mobility plan development. During the project period selected cities will benefit from the creation and implementation of workplace mobility plans. In the stakeholder involvement process several events will be organized to reach the wider acceptance of the plans. The pilot actions and pilot investments will be implemented to increase commitment of the staff employed at the municipalities. Communication and promotion activities will also target the staff working at the municipality administration.

In order to reach these objectives a roadmap has been established (Fig 1). According to the project duration, the roadmap is designed for 3 years with yearly phases as planning, implementation and evaluation. This paper deals with implementation phase with specific emphasis on the evaluation of the process, which starts from the methodology to the realization of the workplace mobility plans. The realization is represented by measures, which are actually the results of the workplace mobility plans.

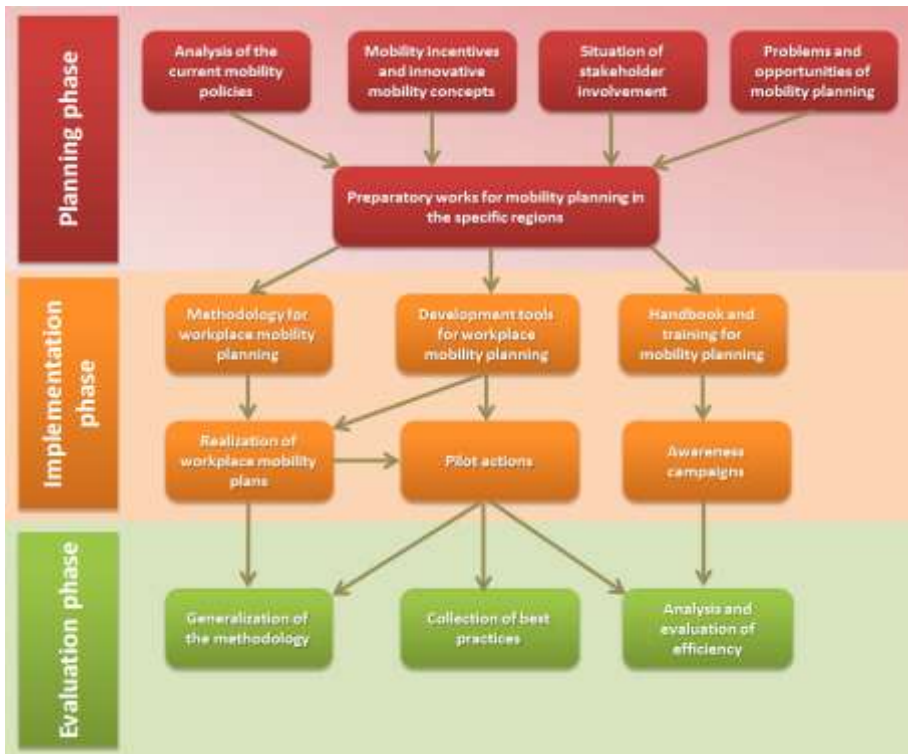


Fig. 1. Roadmap for mobility planning

3. Methodology of mobility planning

The method consists of 6 steps, which are strongly connected to each other (Fig 2). First the mobility concept creates the basics and main development directions. Then the mobility team is set up from different stakeholders to further elaborate the options and discuss the ideas. During the analysis of the current situation the mobility behaviour of the employees should be measured and site audits have to be conducted to receive input information about the institution. Then the specific measures have to be elaborated, which reflect the real needs of employees and opportunities of the institutions. Some measures have to be implemented based on financial options and schedule. Finally the measures have to be evaluated based on usage statistics and feedback of the employees.

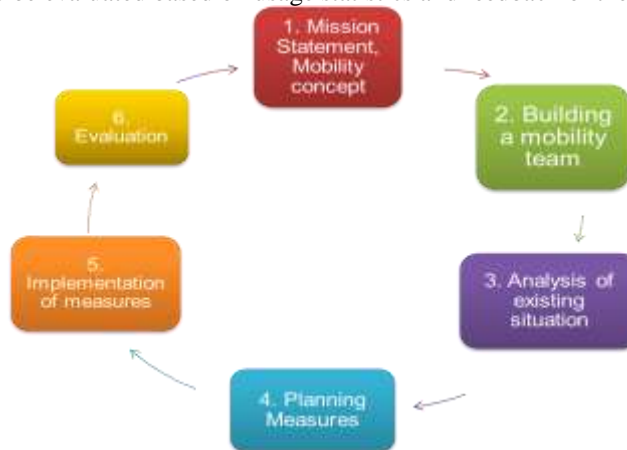


Fig. 2. Steps of the planning process

3.1. *Mobility Concept*

The first crucial step in developing a workplace mobility plan is to create a concept on how to elaborate the plan and get the relevant people on board. A mobility concept sets out the goals and priorities for the long-term development. A transition towards sustainable mobility requires active support from the employees and other stakeholders.

For the mobility plan it is essential to have the support and involvement of the relevant stakeholders right from the start. When it comes to making decisions on different element of the mobility plan, the support of the management of the institution has to be gained, because most measures will require funding. In order to get the relevant decision makers on board the benefits of the workplace mobility plan have to be well highlighted. In the preparation phase of the mobility plan a concept has to be created on how to elaborate, implement and evaluate the measures. It is crucial to set up a project plan with goals, milestones and indicators.

3.2. *Mobility Team*

For the development of the workplace mobility plan and the successful implementation of mobility measures commitment of all persons involved is needed and responsibilities have to be created. When the workplace mobility plan creation is supported and authorized, it is necessary to assemble a mobility team, which will be responsible for the mobility planning process. The members of this group should be the mobility manager, other internal or external mobility experts, transport engineers, building manager, deputy of the institutional management, responsible for communication and workers of the relevant departments or teams (e.g. development, investment). Enthusiasts, such as influencers, among employees can also be a huge asset to the group.

3.3. *Analysis of the existing situation*

To ensure that the chosen measures to encourage more sustainable transport will work, first a clear picture has to be established, how people travel and what facilities already exist.

Generally the staff travel assessment is carried out by a survey representing the baseline data, from which workplace mobility plan measures are developed. Questionnaires must be easy to fill in and as short as possible, with simple questions to maximize response rate. It gives a picture of staff travel patterns, and collects information on what measures would help make the employees change their travel habits. Also regular meetings with focus groups have to be organized with employees to receive information about their travel patterns in details, the reasons of mode choice and the willingness to change.

A site audit should assess the accessibility of the location by different modes of transportation and the existing facilities. The site audit assists receiving information about realistic alternatives. During the site audits the following checklist can be used:

- traffic situation,
- parking management,
- public transport system,
- cycling network,
- infrastructure for pedestrians,
- car-pooling and car-sharing services,
- soft mobility measures,
- specific problem zones and good practices.

3.4. *Planning measures*

There is no unique solution to answer all transport needs, as some employees respond to specific measures and others may not react to any. A combination of measures should be introduced to let employees choose in accordance with their mobility needs. The key to a successful workplace mobility plan is to identify those alternatives that employees are willing to use, hence encouraging modal shift. The basics of developing a realistic package of

measures are the travel survey and the focus group meetings. These steps identify those elements, which are mostly supported by the employees and highlight the areas worth focusing most effort. There should be a balance between the cost and potential benefits of measures.

3.5. Implementation of measures

The key document created in this phase is the action plan. This tool describes in detail steps of the whole process of implementation. The specific goals, targets, responsibilities, financial sources and measures itself along with the timeline of the process are included. The measures are sorted into immediate measures, short-term measures and long-term measures, thus the timeline of realization is different for each of them. The indicators should be part of the action plan as well, as they help measure and control the success.

3.6. Evaluation

A workplace mobility plan is a dynamic process and develops over time. This process can be measured using a well-defined monitoring plan, because the impact of any new measures and policies needs to be checked thoroughly. Monitoring and evaluation of activities deliver data about the impact of measures. It should be carried out before, during and after implementation of measures and should relate to the achievement of targets.

Monitoring should help to produce new or refined targets and an appropriate campaign to support the achievements. In order to compare the results properly, the monitoring methods should be kept consistent over the timeframe. A cyclical revision is planned in case of the workplace mobility plans based on an annual survey among the employees on their actual mobility habits and demands. During the process goals, measures and implementations should be revised and eventually modified. A couple of years later the collected data will be the basis of analyzing longitudinal trends. Moreover later surveys should pay attention to collect user experience of the earlier introduced measures. After this revision measures should be postponed or taken forward

4. Evaluation of the planning process

The planning process was evaluated considering several aspects. First the general commitment and vision of the institution was analyzed. Then stakeholder involvement and the current situation were discussed using online survey, personal interviews and focus group meetings. Finally the chosen measures and recommendations were formulated, so that best practices and lessons learnt can be shared. The evaluation covers three institutions in three locations with specific parameters, as size of the city, number of employees, location of the institution in the city and general modal share (Table 1).

Békéscsaba City Hall (BCS) is an institution with ca 200 employees. The city is rather small with good infrastructure and small distances. The institution is located well in the city, the modal share represents the typical rural area. BKK Centre for Budapest Transport (BKK) is an institution with ca 1200 employees. The city is a busy capital with well developed infrastructure and several transport options. The institution is located in the very center of the city with all benefits and drawbacks, with an exceptional sustainable modal share. Budapest University of Technology and Economics, Faculty of Transportation Engineering and Vehicle Engineering (BME) is an institution with ca 200 employees. The city is a busy capital with well developed infrastructure and several transport options. The institution is located close to the center of the city with an average city modal share.

Table 1. Overview of the institutions

Parameter/Institution	BCS	BKK	BME
size of the city	small	big	big
number of employees	200	1200	200
location of the institution	very good	very good	good
modal share	rural	exceptional sustainable	average city

4.1. Commitment

BCS

The city's level of commitment towards sustainability is represented in the Integrated Urban Development Strategy and in the Transport Development Concept. The development strategy sets out general goals for downtown traffic regulation, where the City Hall offices are located. The development concept addresses a general objective related to urban quality of life and living standards, which are closely aligned with the goals of the workplace mobility plan. More detailed the objectives are to ensure sustainability of public transport, to favour non-motorized modes of transport, to calm traffic in downtown and residential areas and to rationalize public parking, through an advanced management strategy. During the process, the commitment to cycling became a self-reflecting practice for the City Hall from a general idea.

BME

Sustainable mobility is a major issue at the university, as the promotion of a healthy lifestyle is included in the Institutional Development Plan of the institution. The university buildings are close to the center of the city, therefore it is important to reduce external environmental impacts, which can be achieved by promoting environmentally friendly modes of transport. Because of educational purposes showing good example is essential to the general public and other institutions. Thus showcasing environmentally friendly transport opportunities to positively affect travel habits is generally supportable.

BKK

The institution is the organizer of public transport services in Budapest, and operates also the bike sharing system, therefore it is highly committed to sustainable modes. As the company is participating in several EU projects related to Sustainable Urban Mobility Plans, the objectives the project are perfectly in line with the general goals of the company, the only difference is in the used tools and target groups.

4.2. Vision

BCS

The vision development was based on a breakdown from the urban development plans, and conversations during workplace mobility plan process. The following vision was set up:

1. Strengthening environmentally conscious thinking among colleagues.
2. Introducing sustainable solutions for commuting and business trips.
3. Becoming an example for local employers and all citizens.

BME

In the vision the university tried to define general goals related to its specific position as an educational and research centre of mobility. The main goals are the followings:

1. Supporting healthy way of life and proactively handling commuting problems of employees.
2. Showing good example for other institutions and for students.
3. Reducing the environmental impact caused by commuting.

BKK

The vision of the company is to shape the future of urban mobility with know-how, information provision and developing commitment to sustainable modes of transport. Thus it has the following goals set:

1. Maintaining the excellent share of public transport.
2. Providing information on available options and experience of sustainable choices.
3. Motivating internally and externally with testing new types of interventions.

4.3. Stakeholder involvement

BCS

During the planning process a mobility team was formed by colleagues from the City Hall, who represented the executive level, the strategy department and the facility management. The Mobility Team was supported by external experts, who can bring new ideas, can be provocative and have a fresh look on old problems. However internal stakeholders are those, who have personal experience, can make decisions and foresee the effectiveness of the measures. A wide-scale forum was held to discuss every opinion about commuting, every department was represented in this stakeholder meeting. The online survey was an extensive current state and demand analysis, where around 25% of the workers gave feedback about their mobility. During focus group meetings some relevant problems and solutions were identified. The functional urban area dimension also came up among stakeholder's contributions, as several colleagues are commuting from the remote villages.

BME

Setting up a mobility team for the institution, where most of the employees have some knowledge in transportation was both a convenient and an inspiring task. During the formation of Mobility Team, attention was paid to have a participant from the financial point of view, one handling technical possibilities, and one from higher decision making level. Also external stakeholders were needed, who helped in issues of facility management. Finally the mobility team had a dedicated cyclist as volunteer members. From the whole staff, which is around 210 people, 57 responses were received for the online travel survey. During the process many employees thought of their commuting habits and what would be the way to change them. After a lot of personal discussion and brainstorming some measures were sorted out and other measures were fine tuned. Good example of the leaders is a specific contribution as the head of department is commuting from the functional urban area with bicycle.

BKK

In case of BKK first the question of how to handle limitations between locations and offices was handled. The institution has several locations and various types of work schedule. During the process it was realized that planning should be carried out only for one specific location. After these considerations the mobility team was set up by HR specialists, mobility experts and an external partner from the facility management. Every major step of the process had an effective contribution from stakeholders. The internal experts could easily run through the process with the help of the methodology and external experts. With the support of this team we carried out an analysis of the employees commuting habits and demands with online survey and personal meetings. The online survey had 265 responses, which is almost 22% of the staff. Since the dominance of the public transport appears in the functional urban area, all measures considered commuting.

4.4. Situation analysis

BCS

Most employees are using either public transport or private cars. Every third colleague commutes by public transport, and the high proportion of pedestrians (16%) is due to the central location of the workplace. 13% of cyclists is not a very strong result, thus bicycle ratio should be improved. Considering distances between the distance 2 to 5 km, the share of bikers is over 30%, between 5 km and 10 km only 10%, and over 10 km, there is practically no interest in biking. At the same time cycling infrastructure is well developed, not just in the city, but also in the functional urban area.

BME

Most employees are commuting either by public transport or by private car. Pedestrians and cyclists do not make 15%. Since the institution does not provide a company car, private car users are commuting on their own costs. At the same time flexible working hours make it possible to avoid congestion at the city center and the parking situation is acceptable. With increasing commuting distance, individual traffic has an increasing share, while walking and

cycling completely disappear. It would be desirable to reduce the use of individual vehicles in commuting shorter than 2 km. Over 10 km commuting distance the share of public transport drastically decreases, which is the distance of the border between the city and the functional urban area.

BKK

Modal split shows very high public transport usage compared to average values in the city, and there are three main reasons for this. The first is that the employer is responsible for organizing public transport, so employees are more committed to use public transport. The second reason is that every employee receives free monthly passes. The third important point is the downtown location of the office building with very good public transport links from every point of the city and from the functional urban area too. In the same time for private car users the location is difficult to access. The 10 percent use of cars is due to the fact that certain high level positions are linked with a company car. Significant deviation was only present in case of short-term journeys, where walking had a high amount. The share of individual car usage is growing steadily with the growth of the travel distance.

4.5. Implementation of measures

BCS

As a result of the previous steps 6 measures were proposed in agreement with the mobility team. Majority of these are connected to cycling, which is a strategic point for the institution. Infrastructure development is needed mostly at the end-points, as currently there is no chance to take a shower or change clothes. The buildings have a suitable location for this development, and the intent is to establish a cloakroom and shower with closable storage. A company owned bike fleet will be purchased to serve business trips within the city for those, who are not commuting by bike. This is also a testing opportunity for workers who are currently hesitating on purchasing an own bike. Electromobility is another measure, which is planned to be developed: electric car and electric bike charging points will be deployed. Two of the measures are planned to decrease private car usage, one with a raising awareness campaign and the other one is the development of a parking management strategy.

BME

For further spread of sustainable transport modes during commuting nine measures were proposed. The first measure is purchasing electric rollers, because the execution of trips within campus is problematic due to the long distances between the university building. Some other measures will help cycling, for example introducing bike-sharing passes, developing shower facilities and lobbying for safer cycling network around the campus. A long-term development is also planned: shuttle bus services in and around campus with self-driving vehicles. This idea on the one hand requires a lot of innovation and has a lot of barriers, but it reflects one of the main problems of the campus, namely the public transport stops are relatively far away from the buildings.

BKK

Since the current state of the modal share is quite satisfactory, the measures of the mobility plan mainly concentrate on more activity by bike. The plan contains measures, such as simplification of bike-sharing usage for employees, or as an infrastructure development a bicycle tool kit will be purchased, and later company owned bike fleet, too. Another measure has a secondary goal beyond sustainable commuting: building a better workplace community by establishing an innovation lab. This is a group of employees, who are open to innovative solutions and sustainable transportation. The renewal of company owned car fleet will help to reduce the company's CO₂ emission. For both private cars and bikes electric chargers are planned to be built in the workplace.

4.6. Recommendations

BCS

1. The workplace mobility plan should build on existing plans and visions of the city. The institution should act as a flag carrier in the implementation of the above mentioned vision.
2. Involvement is essential, considering both for employees and for decision makers. With these involvements the workplace mobility plan will reflect real demand and will remain realistic in the implementation at the same time.
3. Cooperation with other mobility related projects (e.g. building electric chargers) can bring better results due to synergy, thus the developments around the institute will be handled in a complex way.

BME

1. Collecting as much information as possible facilitates the planning process. The online survey gives mostly statistical data, while personal interviews and forum conversations are helpful to gain insight into the background of mobility related choices.
2. Institutional barriers should be considered at the beginning and a good scope of plan should be chosen. A lower-level involvement provides better outreach to the employees and more effective planning process, whereas the higher-level involvement gives better financial opportunities and has longer term potentials.
3. Composition of mobility team is good, when the team is containing decision makers, facility management representatives and enthusiastic volunteers.

BKK

1. It is important to have a good example for other institutions in the region when planning the process and implementing the measures.
2. The location of the workplace within the city, public transportation connections and availability of bike lanes helps a lot achieving high percentage of sustainable transportation mode usage, but financial incentives have the most enormous effect on mode choice.
3. Measures of the planning process should be connected with other aims of the institution, thus implementation is more supported by high level decision makers.

5. Summary

We have developed a new approach to workplace mobility planning by establishing a roadmap with planning, implementation and the evaluation phases. The paper investigated the implementation phase with specific emphasis on the evaluation of the process, which starts from the methodology to the realization of the workplace mobility plans.

The method consists of 6 steps, which are strongly connected to each other. First the mobility concept creates the basics and main development directions. Then the mobility team is set up from different stakeholders to further elaborate the options and discuss the ideas. During the analysis of the current situation the mobility behaviour of the employees should be measured and site audits have to be conducted to receive input information about the institution. Then the specific measures have to be elaborated, which reflect the real needs of employees and opportunities of the institutions. Some measures have to be implemented based on financial options and schedule. Finally the measures have to be evaluated based on usage statistics and feedback of the employees.

The planning process was evaluated considering several aspects. First the general commitment and vision of the institution was analyzed. Then stakeholder involvement and the current situation was discussed using online survey, personal interviews and focus group meetings. Finally the chosen measures and recommendations were formulated, so that best practices and lessons learnt can be shared.

The evaluation covers three institutions in three locations with specific parameters, as size of the city, number of employees, location of the institution in the city and general modal share. All three locations followed the steps of the process. In Békéscsaba the biggest emphasis was put on cycling infrastructure development and electromobility with intensive stakeholder involvement from different areas. In BME an extensive data collection was realized with

several meeting, which resulted in several innovative measures, such as electric rollers, bike-sharing for business and bus service. In BKK the measures were connected with other initiatives of the institutions, thus an innovation lab, bike fleet and electric chargers were the most relevant measures to implement.

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