

**Guidance for  
Campus mobility plans**



## Document information

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# Foreword

In 2012, a Green Travel Plan for the Chalmers University of Technology, Campus Johanneberg, in Gothenburg, Sweden, was initiated. The plan has since been implemented and yearly evaluated. Due to the promising results we saw a potential to export the process to other universities, primarily in the Nordic countries because of similar preconditions, such as legislations and administrative structure etc. The overall aim with this guidance is to increase the up-take of qualitative mobility plans around universities which will contribute to more sustainable cities, especially where there are challenges related to transportation.

A consortium of universities, property owners, city administrations and consultants from Sweden, Finland, Norway and Denmark was assembled in 2018 to realise this idea and to develop guidance-material on how to increase the level of sustainable transports at campuses in Nordic countries through the creation of a campus mobility plan.

This guidance address campus and property developers, property owners and urban transport planners who have connection to an urban university campus and its development in terms of transports and campus sustainability. This guidance can also serve as inspiration and reference for decisionmakers at universities, property companies and city administrations to enable financing of campus mobility measures.

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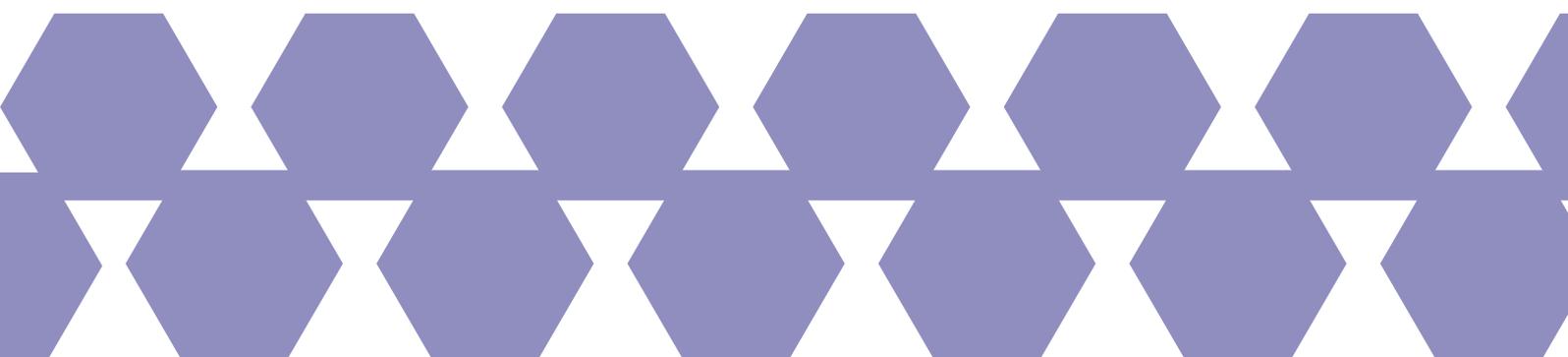
- **Chalmers University of Technology, Sweden**
- **University of Gothenburg, Sweden**
- **Helsinki University, Finland**
- **Norwegian University of Science and Technology, Norway**
- **Technical University of Denmark, Denmark**
- **Chalmersfastigheter, Sweden**
- **Akademiska Hus, Sweden**





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# 1. Campus mobility plan in a context

## The role of the campus in a sustainable city

Large universities are estimated to generate 10 000 or more trips per day, many of them made by private car. At the same time many campuses are expanding with the resulting effect of increased traffic flows and a greater impact on the transport system. Beside the impacts, such as congestion in the local transport system, many these trips are made by private car which is problematic from the impact on:

- Climate impact,
- Air pollution,
- Noise levels,
- Land use - attractive land must be used for spacious parking facilities.

If a campus is seen as integrated area in a city, generating thousands of trips every day due to high numbers of staff and students, beneficial solutions for both the university and the city must be found to handle the aforementioned issues. Due to this,



there is a need for universities and cities to unite and together set the direction for the development of attractive campuses that also contribute to a more sustainable city. A campus mobility plan is a useful platform for such cooperation.

Several universities around Europe have already conducted mobility plans focusing on transport management at campus. As an example of that campus mobility plans are getting more and more common is the network U-Mob, a network that gathers universities in Europe engaged in the reduction of CO<sub>2</sub>-emissions through more sustainable mobility practices<sup>1</sup>. Still, there are many campuses left which can benefit from a plan for a sustainable mobility.

## What is a campus mobility plan and why is it needed?

A campus mobility plan is a tool for planning of more sustainable and space efficient transportation generated by a campus. A campus mobility plan should preferably address all transport issues connected to a campus including trips generated by commuting staff and students, business travels and visitors but also fleet and freight management.

A campus mobility plan is a means for stakeholders to achieve decided targets and goals related to sustainability and campus development. By cooperation among stakeholders, the plan can serve as a platform for a common aim and objectives which brings different organisations together and by common forces increase the chances to reach the goals. An adopted plan will make it clear, both internally and externally, what decisions have been taken and what actions shall be taken regarding the mobility situation. Cooperation creates the possibility for implementation of additional and more efficient measures and the positive results can be expanded compared to if one stakeholder work on its own.

<sup>1</sup> U-Mob 2018. Network. Available: <http://u-mob.eu/network/>

A campus plan can be used to address several challenges such as:

- Traffic congestion and lack of car parks,
- Low quality of infrastructure for public transport, cycling and walking,
- Lack of expandable areas for new facilities due to car parking space demand,
- Unattractive campus environments due to vast parking areas, noise, poor air quality and traffic safety,
- Lack of outdoor areas for recreation and social activities,
- Decrease the organisations' climate footprint.

By addressing these challenges, there are many benefits to be gained and some of them are shown in box 1.



### *Box 1 – Possible benefits from an implemented campus mobility plan*

A well implemented campus mobility plan contributes to a more attractive campus, better accessibility, higher-density area, lower carbon emissions, and healthier staff and students.

- Universities can benefit due to a more attractive campus (for example more areas for recreation and vegetation), higher density, enabled expansions, healthier staff and students and goodwill as a green organisation.
- Cities can benefit due to a more attractive city, less congestion and emissions but also synergies from close cooperation with the research faculties addressing local challenges related to mobility.
- University property owners can benefit from enabled and less costly expansions due to less demand for car parking facilities and less noise.
- All people active at the campus (staff, students, visitors etc.) can benefit due to better accessibility for sustainable transports such as bikes and public transport, better health, cleaner air, less noise and more attractive campus environment. Remaining person and freight transports will get better accessibility in a less crowded transport system.





### **Local spotlight**

**Chalmers University of Technology** - In 2011 the real estate companies Chalmersfastigheter and Akademiska Hus, together with Chalmers University of Technology and Johanneberg Science Park started the process to develop the campus area. The aim was to increase the number of employees with 4 000, almost doubling the existing number of employees. The city of Gothenburg was positive to the extension, as long as the car traffic didn't increase with corresponding increase of noise, lower air quality and other negative impacts on the transport system. The city of Gothenburg demanded a mobility plan as a mean to allow a change of the zoning plan. The example shows how a mobility plan can be used to handle air and noise problems related to the traffic situation and be the foundation for a long-lasting collaboration between the responsible stakeholders in a campus area. Still the stakeholders meet to set new goals, discuss measures and effects and act as a progressive part in the city planning of the campus and surrounding area.

## Campus as a playground; knowledge, science, innovation and engagement

There are a few things that can be highlighted to explain the difference between a campus mobility plan and a green travel plan/mobility plan designed for other areas, such as larger work places or city districts. At a campus there are several unique conditions which create opportunities that seldom can be found at other places. A compilation of these conditions is shown in box 2.

### *Box 2 – Unique conditions useful for the development of a campus mobility plan:*

- **Students** – A campus would not be a campus without its students. By involving students in the process, the plan benefits from their creativity, innovativeness and engagement which can be used to raise the quality of the plan and its measures.
- **Research and knowledge** – The whole environment at a university breaths learning, research and science. The possible contribution to a mobility plan can be derived from different types of faculties and scientific areas. Tailored collaborations with researchers might be a possible spin-off.
- **Mix of public and private** – University science parks or other links between research-driven faculties and the private sector might be an arena for small or full-scale trials aiming to implement new and innovative measures. Successful measures can then be expanded to other parts of the city.
- **Low average age** – At a campus the average age is lowered by the large number of students compared to employees. This increase the potential for acceptance of measures. Young people are more prone to sustainable transport behaviour. The chance increases that they will keep doing that in their post-graduation life with every year they get to form the habit to travel by sustainable transport modes. This argues reasons for a city administration to support activities directed at students (Busch-Geertsema & Lanzendorf, 2017).
- **Lighthouse** – A campus is often an area for innovation with a drive to find solutions to improve societies and cities. Also, a university's status in the society often is highly rated. Thus, a campus can be a lighthouse for the rest of the city regarding sustainable mobility. A campus can also be attractive for service providers since campuses have a high density of people. A campus can be attractive for trials for new mobility services and business models.

## 2. Tailored guidance for developing a campus mobility plan

### *From aim to action – description of the process*

This chapter describes a tailored guidance for developing a campus mobility plan. The guidance is split between two phases: **the creation** and **the implementation** of a campus mobility plan.

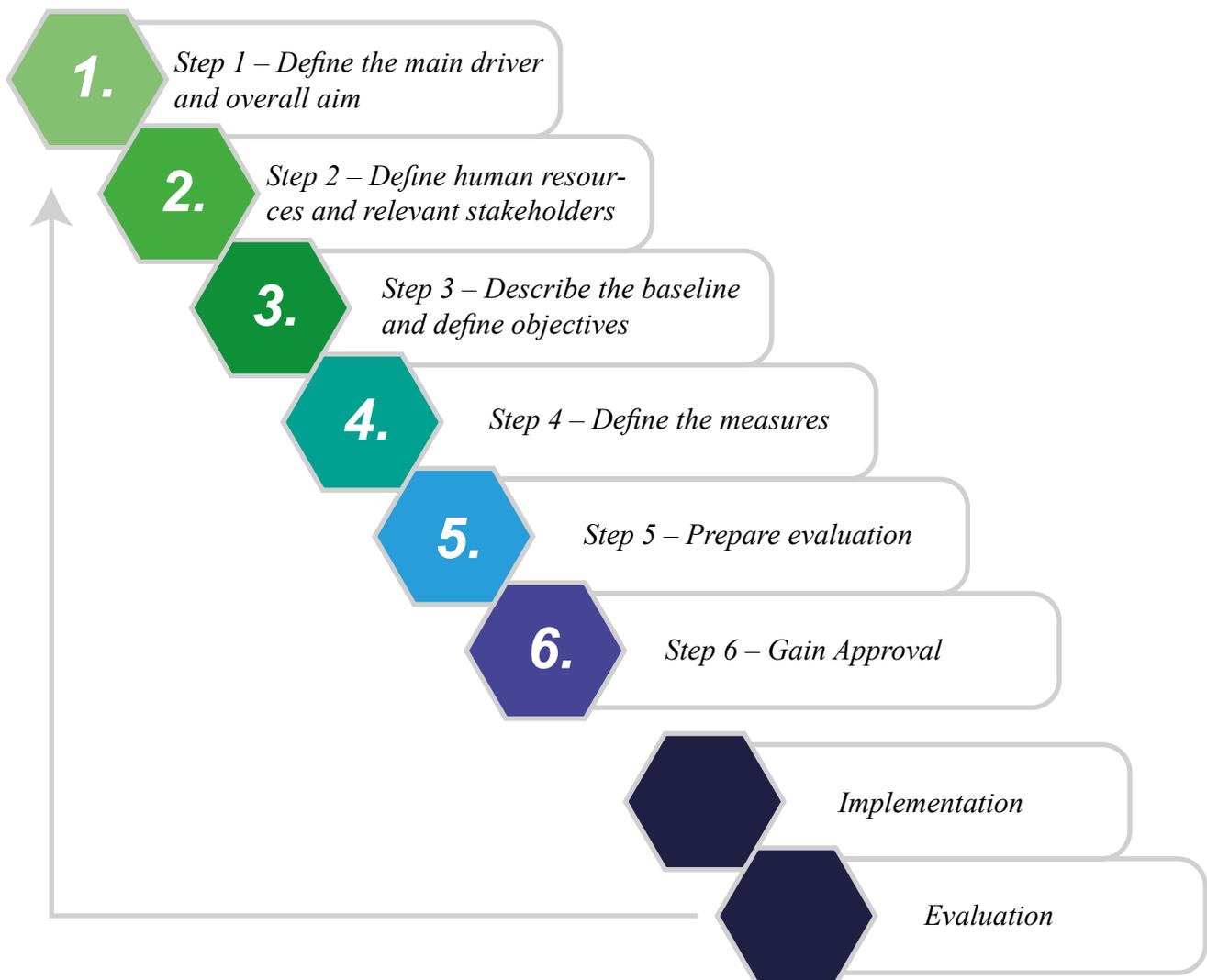


Figure 1 Step by step how to create and implement a campus mobility plan

**The creation** – The initial steps are the foundation for a useful, valuable campus mobility plan, accepted by all participating stakeholders. The first two steps are necessary to set the framework for the process and make the necessary preparations for a successful collaboration. The following steps are all about developing the campus mobility plan.

**The implementation** – The last steps describes how to proceed after the plan is developed.

## Linear or circular process?

The creation of a campus mobility plan can be seen as both linear and circular.

**Linear** – The process for developing a campus mobility plan is linear when the overall objective is related to enable campus development by expansion, as physical expansion is connected to the administrative linear process for land use planning and building permissions in a municipality.

**Circular** – Once the implementation and evaluation phase are activated, the ball has been set rolling and there is a good opportunity to restart the process and raise the ambitions. This is also an opportunity to adapt the plan to new circumstances such as possible new techniques, new set of regulations and change of norms that might occur over time. The process can then be used as an iterative cycle for continuous improvements. This might also be valid if the mobility plan is initiated from the beginning at a campus without certain expansion plans.

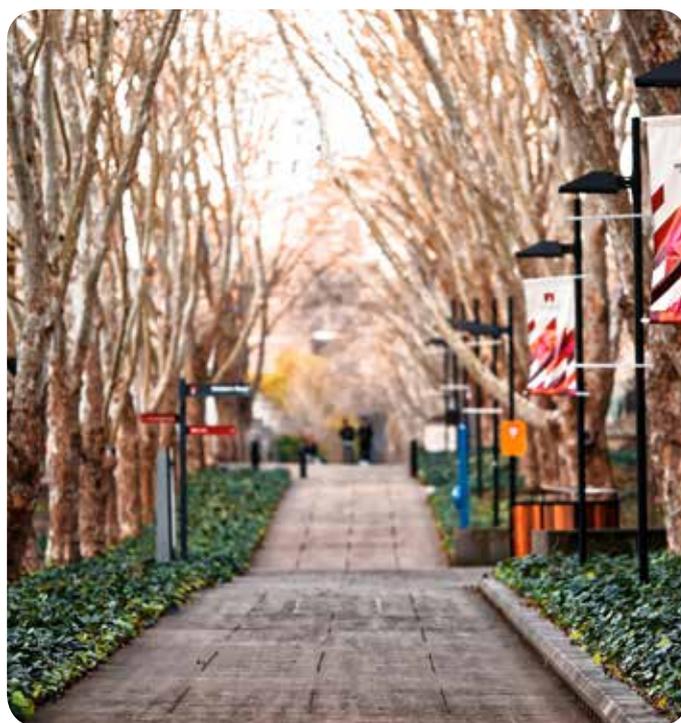
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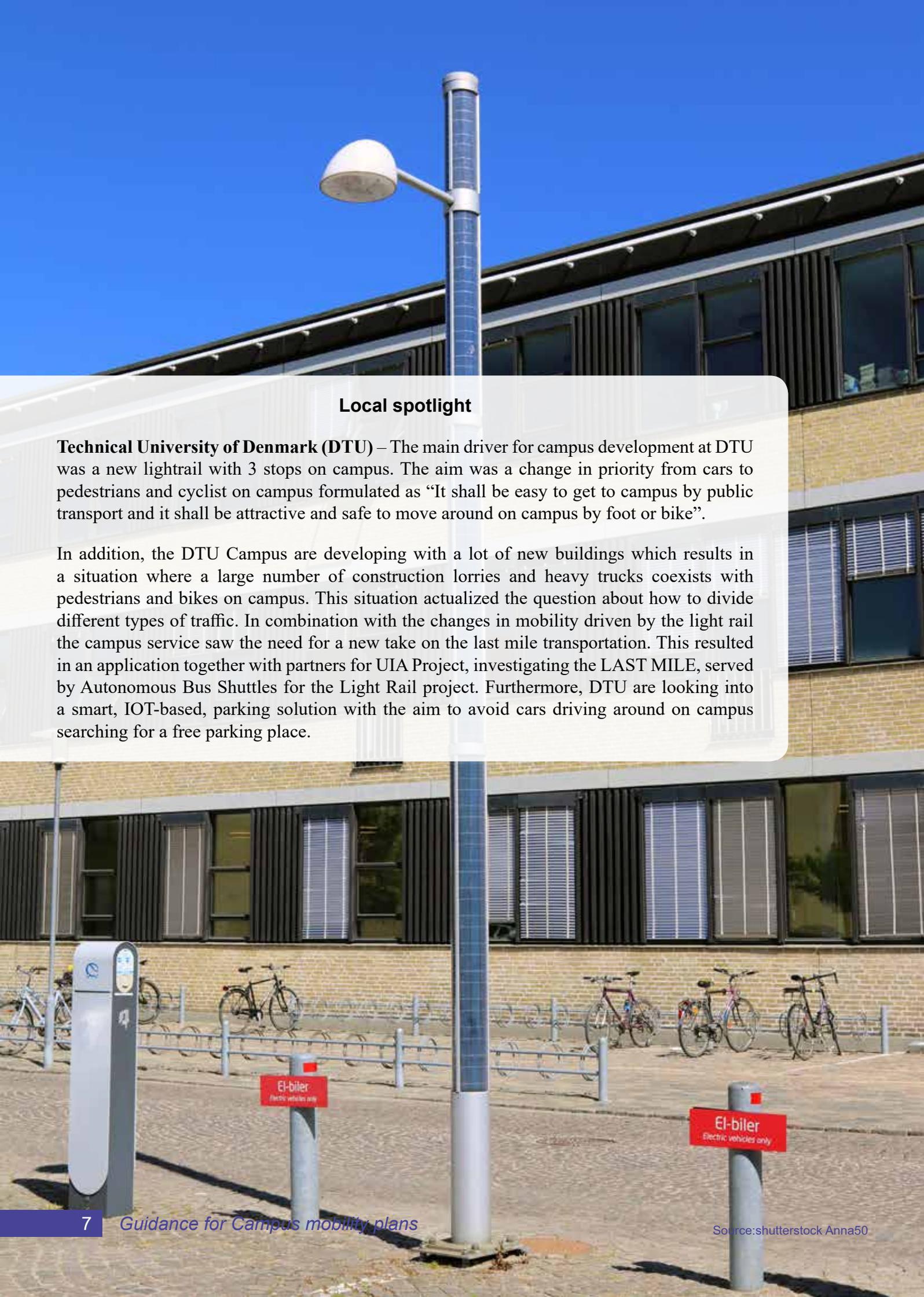
## Step 1 – Define the main driver and overall aim

The first step is to draft the main drivers and/or challenges that most likely have to be faced. An overall aim (which will be further elaborated in step 2) based on those drivers and challenges can then be drafted for the campus mobility plan. In many cases the main driver is connected to development plans for a more attractive campus, but there could also be challenges like low accessibility, congestion or access to parking.

### Checklist 1

- Have you listed the main drivers and challenges for the campus? E.g. what initiated the process of creating the campus mobility plan?
- Have you defined the overall aim for the campus mobility plan?
- Are your overall aim related to aims, targets, and/or goals on a higher level, e.g. local or regional goals for sustainability?





## Local spotlight

**Technical University of Denmark (DTU)** – The main driver for campus development at DTU was a new lightrail with 3 stops on campus. The aim was a change in priority from cars to pedestrians and cyclist on campus formulated as “It shall be easy to get to campus by public transport and it shall be attractive and safe to move around on campus by foot or bike”.

In addition, the DTU Campus are developing with a lot of new buildings which results in a situation where a large number of construction lorries and heavy trucks coexists with pedestrians and bikes on campus. This situation actualized the question about how to divide different types of traffic. In combination with the changes in mobility driven by the light rail the campus service saw the need for a new take on the last mile transportation. This resulted in an application together with partners for UIA Project, investigating the LAST MILE, served by Autonomous Bus Shuttles for the Light Rail project. Furthermore, DTU are looking into a smart, IOT-based, parking solution with the aim to avoid cars driving around on campus searching for a free parking place.

## 2.

## Step 2 – Define human resources and relevant stakeholders

A campus development is not only of concern for the university administration and the property owners. Many other stakeholders and a lot of citizens are also affected by the impact from a campus. Experience shows that there are usually one or two stakeholders that initiate the work, but more stakeholders are needed to reach a fruitful cooperation and a successful result.

One of the key aspects for a successful campus mobility plan is the motto:

*“Common effort makes greater results”*

Step 2 is divided into four actions for how to achieve this:

- **Action 1:** Locate a process leader for the development of the plan
- **Action 2:** Draft benefits for relevant stakeholders
- **Action 3:** Invite relevant stakeholders
- **Action 4:** Establish a framework for the process

### *Box 3 – Characteristics of a process leader:*

- Neutral and engaged.
- Clear mandate to act.
- Good communication skills.
- Capable of creating an efficient project structure.
- Knowledge of mobility as a system. Some understanding of the mobility sector.
- Accepted by all participating stakeholders.
- Ability to understand each stakeholder’s perspective and prioritise in a manner that is perceived as fair by all partners.

### **Action 1: Locate leaders with engagement and mandate to act**

As mentioned above, one or two stakeholders are often the initiators of a campus mobility plan. Who it is that initiates depends on each case, but it is usually either the university administration, the property owner or the city administration. Any of these initiators can act as leader of the process, but sometimes it can be even better to contract an independent process leader.

Sometimes one stakeholder must exercise their authority in the process due to legislation or other reasons and is therefore the natural leader of the process. One example is if a campus mobility plan is initiated as a precondition for an approved building permission or land use plan by the local government.

### **Action 2: Build the case – define the aim and describe benefits**

The draft of the main drivers and the overall aim (step 1) will need to be elaborated and extended to interest a diversity of stakeholders. Preferably, the aim should be well integrated with other aims/visions that already might exist for the university itself, the specific campus, or for the city. By defining a clear aim and display benefits for each potential stakeholder, decisions makers can be more willing to allocate resources.

### **Action 3: Invite relevant stakeholders**

The process leader and the initiating stakeholder(s) should together draft a list of relevant stakeholders for the development of the plan. The stakeholder analysis should begin with a broad approach and then be narrowed down to stakeholders with primary interest in the subject. See box 4 for a list of potential stakeholders.

#### Box 4 – List of potential stakeholders

- University management e.g. campus development, human resources, property owners, board, marketing/communication
- Departments within the university focusing on e.g. sustainable development, environment, urban development, architecture, transport
- University science park
- Property owners
- The city administration
- Student union
- Local public transport administration
- Potential service providers
- Residents in the area / surrounding areas
- Other actors in the area that have a large transport demand (human/freight).

This analysis also includes identifying key persons that should take part in a working group or reference group. The group should have in total enough competence to deal with questions in an objective way. Experts and specialists can be invited or connected to the group when appropriate. Beside competence and understanding of the subject itself, it is important that participating persons have a close connection to the decision makers within their own organisations. If the process gets complex, a steering group might be a solution to break down barriers and issues. Secondary stakeholders must not be forgotten. A communication plan can define in what way and when this group can be involved or reached.

After the stakeholder analysis is finalised, it is time to invite the stakeholder to participate in the development of the plan.

#### Action 4: Establish a framework for the process

Once the stakeholder group is selected, an agreement between the partners should be written of how to carry out the process. The agreement should be based on the purpose of the campus development process and preferably contains:

- Who is responsible for what and when?
- What is expected from the stakeholders during the process?
- Timing and milestones for the process.
- If necessary – Resources needed in the process e.g. budget and personnel.

A recommendation is to consider if the cost of the plan development should be shared between all principal stakeholders. This is likely to improve the sense of ownership of the plan and will improve the engagement of each stakeholder.

#### Checklist 2

- Have you located and delegated or contracted a process leader?
- Have you formulated an aim for the future mobility situation at the campus to use in the communication with the potential stakeholders?
- Have you singled out the primary and secondary stakeholders and have they been invited to be a part of the process?
- Has a clear framework for the process been developed and accepted among the participating stakeholders?



### Local spotlight

**Helsinki University, Finland** – Following the Finnish model “Commitment 2050” to implement sustainable development goals, the University of Helsinki has made a commitment called “Healthy and sustainable forms of workplace travel”. The university commits to enact a programme of measures to advance healthy and sustainable forms of travel. The programme will improve conditions for commuter bicycling for students and staff members and encourage the use of public transit. The objective is to advance workplace wellbeing and reduce the carbon footprint of university students' commutes.

# 3.

## Step 3 – Describe the baseline and define objectives

Step 3-6 are all about developing the campus mobility plan. Step 3 is divided into two actions.

- **Action 1:** Baseline – describe the state of the mobility situation
- **Action 2:** Break down the aim and the challenges into objectives

### Action 1: Baseline – describe the state of the art of the mobility situation

The first action in Step 3 is to define the baseline, the present mobility situation of the campus and surrounding areas. By gathering this information, it will be easier to set the right objectives and to choose the most suitable measures. A baseline also gives a good overview of strengths and weaknesses of the present mobility situation.

It's important not only to look at the campus, but also at surrounding areas and at the main transport corridors that lead to the campus. Tools for gathering data and information are further presented in chapter 3.

#### Put today's knowledge in the light of the future

Apart from the present situation, development plans and infrastructure plans at the campus and in the surrounding area should also be described. Depending on the scope of the mobility plan it is advisable to include information for the next 10-15 years. This information can give valuable input to what type of measures that should be considered to prepare for the future.

It is also advisable to sketch two or three scenarios of a future campus environment (given today's rapid development in the field of mobility) to see if there are aspects that most likely will change over time and therefore need to be considered.

The outcome of Action 1 will be a short status report that summarises the most interesting aspects of the present mobility situation and identified detailed challenges both for the infrastructure as well as for administration and available services. Here it is important to verify the main challenges listed in Step 1 and to answer the question if the baseline-analysis supports the general and initial understanding of the mobility situation at the campus.

With a mobility status report describing the baseline in place and well-defined challenges, a checkpoint has been reached. Now is a good opportunity to check that all engaged stakeholders agree on the described situation.

### Action 2: Break down the aim and challenges into objectives

Now it's time to focus on the objectives. It is recommended to use the outcomes of the mobility status report to define objectives for the plan. The objectives should support the defined aim.

Objectives can be described based on the level of ambition, quality and level of functionality. One key aspect is that the objectives are measurable so that the progress can be evaluated after the implementation of the plan.

#### Checklist 3

- Do you have a clear understanding of the mobility situation and a corroborated list of local challenges to address?
- Have you defined objectives that support the aim and that can be measured and evaluated?
- Are the objectives agreed on by every participating stakeholder?

### *Box 5 – Relevant information to include in a baseline survey*

- Infrastructure and services for pedestrians, bicycles, public transport, private and shared cars including electric mobility, car and bike parking, freight and waste transport.
- Mobility or use of modes: modal split, traffic flows, number of freight and waste transport.
- Information of parking usage, e.g. occupancy over the day, user groups, origin.
- Travel times to important areas in the city by different means of transportation.
- Environmental quality information: air quality, noise.
- Accessibility to the campus and availability to local services.
- Number of employees and students, other businesses in the area, working times.
- Informational and promotional services and activities.
- Land use and spatial planning, plans for the surrounding area, earlier studies.
- Development and infrastructure plans.

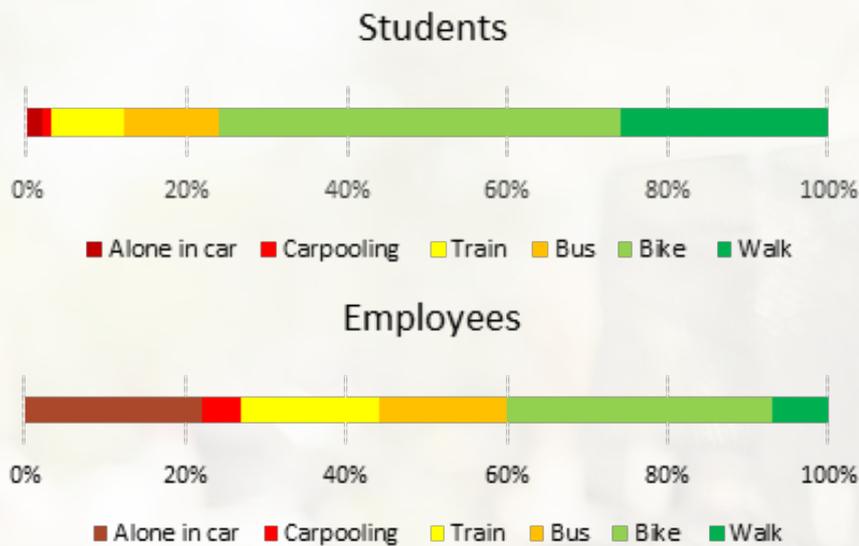


## Local spotlight

**Akademiska Hus, Sweden (AH)** – Lund University’s campus are facing changes. For new buildings there is almost only parking spaces available. And the new buildings or extensions of existing buildings will need additional parking spaces. A proposed campus mobility and parking plan give input on how to handle the mobility and parking situation in the future to ensure an attractive and accessible campus area. As a part of the work several surveys were conducted, e.g.:

- The occupancy of parking spaces were investigated by counting the parked cars and bikes different times. This on-site survey were conducted by hired students.
- Travel habits of employees were caught by a webbased questionnaire to all employees.
- Travel habits of the students and the visitors were caught by an on-site survey during a week in April. This on-site survey were conducted by hired students.

The modal split for employees and students are showed in the figure below.



# 4.

## Step 4 – Define the measures

Step 4 is about defining the best measures based on the local context and the capacity of the stakeholders. Step 4 is divided into four actions:

- **Action 1:** Create a list of measures
- **Action 2:** Rate measures
- **Action 3:** Develop an action plan
- **Action 4:** Describe and gain initial approval for selected measures

### Action 1: Create a list of measures

When starting to gather potential measures it is important to always keep in mind the baseline, identified challenges, what objectives should be achieved and the stated preconditions.

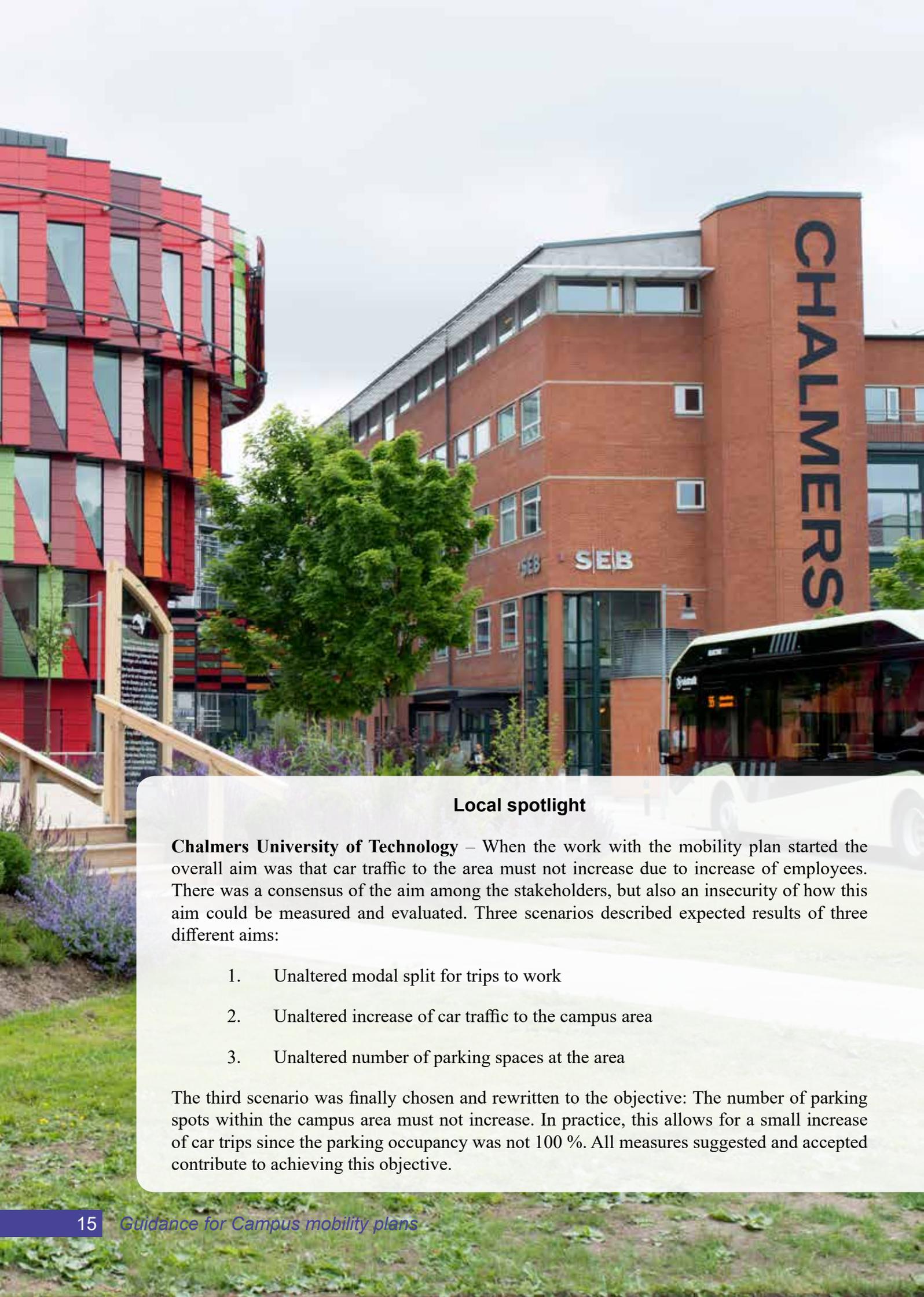
Four types of mobility measures in a campus mobility plan are:

- **Strategic measures** – Measures to create or update policies or other strategic documents, administrative measures etc.
- **Physical environment and infrastructural measures including maintenance** - Measures to improve the physical environment within and close by the campus such as infrastructure for walking, cycling, public transport, car and freight traffic, snow clearance, localisation, etc.
- **Mobility management measures** - Measures that manage demand for mobility by changing travellers' attitudes and behaviour.
- **Regulation, service provision and legislation measures** - Measures that regulates how the transport system and services at campus should be used.

### Box 6 – Examples of measures for a mobility plan

There are often several country-specific sources describing different types of measures in the context of mobility plans. In the European context, there are a number of platforms with measures for urban sustainable planning. These sources can complement local knowledge and be used as inspiration to address specific challenges. The databases are not developed specifically for measures adoptable in a campus but many of the measures are relevant and can be of interest in such areas anyway.

- KonSULT is a database designed to identify appropriate policy measures and packages in sustainable urban land use and transport planning.
- MaxExplorer is an interactive tool to help “mobility management-beginners” in choosing the most appropriate measures.
- EVIDENCE website contains a set of 22 mobility measure reviews (summary and in depth) and training materials for academics and trainers



### Local spotlight

**Chalmers University of Technology** – When the work with the mobility plan started the overall aim was that car traffic to the area must not increase due to increase of employees. There was a consensus of the aim among the stakeholders, but also an insecurity of how this aim could be measured and evaluated. Three scenarios described expected results of three different aims:

1. Unaltered modal split for trips to work
2. Unaltered increase of car traffic to the campus area
3. Unaltered number of parking spaces at the area

The third scenario was finally chosen and rewritten to the objective: The number of parking spots within the campus area must not increase. In practice, this allows for a small increase of car trips since the parking occupancy was not 100 %. All measures suggested and accepted contribute to achieving this objective.

By generating an initial long list of measures, the chances increase to find the most qualified measures for the local context. Below a template is presented that can be used when creating a long list of measures.

Table 1 - Template for the structure of a list of measures and examples of how to describe measures.

Measure	Short description of measure	Responsibility
New cycle path to campus	Construction of a cycle path to the campus from the eastern district of the city.	Infrastructure administration within the city
Parking fees	Instate parking fees for employees and students.	Property owner/University administration
Contest to stimulate and increase bike-commuting	The university arranges a contest where employees compete by using the bike to work most often. The winner gets rewarded.	University administration
...	...	...

When gathering measures, it is recommended to avoid a too narrow approach. Instead, the searching range should be wide and special attention should be given to possible measures unique for the location. Use local experts, professionals within the fields of mobility and conduct a literature study of measures and their outcome. When gathering potential measures, it is also a good opportunity to involve students at the campus for a wider approach, see a further description of how in chapter 3.

## Action 2: Rate measures

Based on the long list of measures the next action is to rate the measures resulting in a shortlist of more promising measures with a realistic chance to be implemented and that contribute to the objectives<sup>1</sup>.

Rating of potential measures can be a complex task influenced by opinions, demands and limitations. The most important aspects to consider when looking for measures to implement are the effectiveness to contribute to a more sustainable campus, and if the measure can be implemented. If not, it should not be taken into consideration<sup>2</sup>.

<sup>1</sup> Source: CH4llenge, E-course on Measure selection, <https://www.mobility-academy.eu/course/view.php?id=55>

<sup>2</sup> SUMP's-Up 2018. Manual on the integration of measures and measure packages in a SUMP – Start. Available: <http://sumps-up.eu/manuals/>

To get a fair view of feasibility and circumstances that must be considered for each measure, it is advised to rate the measures together with all the stakeholders. It is a good idea to prepare the effectiveness rating beforehand and anchor the rating to research and available knowledge of expected effect. Sometimes a more comprehensive assessment or cost-benefit analysis are necessary.

Table 2 - Example of how to organise the rating of the measures listed in Action 1. The rating is preferably done by representatives from each stakeholder in a workshop.

Measure	Effectiveness	Feasibility	Comment
New cycle path to campus	***	**	Needs to be sub-funded by regional government.
Parking fees *	***	*	Needs implementation of payment system
Contest to stimulate and increase bike-commuting	*	***	Need a portal where the results can be shared and monitored and awards to the winners
...	...	...	...

When the rating is done, the list of promising measures forms the foundation for how the stakeholder group believe the objectives should be reached and how the challenges should be handled.

Table 3 - Example of how to organise the decided measures in to an action plan<sup>1</sup> and examples of descriptions.

1 SUMP-UP 2018. Standards for developing a SUMP action plan. Available: <http://sumps-up.eu/reports/>

Measure	Description of measure	Responsibility	Connection to mobility plan objectives	Time of implementation	Funding source	Indicators
New cycle path to campus	Marked lanes and tracks along major urban streets	Road owner	Increase the modal share of cycling	Year 1-5 (construction phase)	Infrastructure administration within the cit	[m] built bicycle lane
Parking fees	Daily fee for employees to use parking facilities at the campus	Owner of parking facilities	No subvention of car parking	Year 1 (user phase)	Property owner/University administration	Income parking fees/occupancy parking
Contest to stimulate and increase bike-commuting	Competition for employees, longest cycling distance during winter months	Employer	Increase the modal share of cycling	Yearly, year 1-4 (user phase)	University administration	Number of new bike-commuters
...	...	...	...	...	...	...

### Action 3: Action plan

Now it is time to agree on details of the implementation of the campus mobility plan and for the selection of measures. In this phase a first version of an action plan can be created, but the plan needs to be verified and described in more detail as a part of the work with the stakeholder agreement in action 4.

The action plan should give enough details and guidance on which measures to implement and when, but at the same time give enough flexibility for future changes in, for example, technology, infrastructure or acceptance among the users<sup>3</sup>. One measure can sometimes be divided into several submeasures where the responsibility is divided between several stakeholders.

The timing of the measures can be divided in to the phases of planning, construction and use of new buildings and infrastructure, see an example on the next page.

3 SUMP-UP 2018. Standards for developing a SUMP action plan. Available: <http://sumps-up.eu/reports/>

### Action 4: Gain approval for selected measures

The aim is to gain approval for the selected measures amongst the stakeholders. A recommendation is to keep the process as transparent as possible regarding each stakeholder's responsibility. It is also recommended to reserve time to enable individual meetings between the process leader and the individual stakeholders if it is called upon by any stakeholder.

#### Checklist 4

- Have you created a long list of measures, with several measures addressing each objective?
- Have you rated the measures together with the relevant stakeholders?
- Have you done the first draft of an action plan for the selected measures?
- Do all stakeholders accept their given responsibilities?

## Local spotlight

### Erasmus University Rotterdam – The new mobility policy

At Erasmus University a new masterplan visualised the need and cost of new car parking that was needed according to the municipal parking requirements. Discussions about the high costs was the start for the development of a new mobility policy with the goal to reduce the amount of employees and students traveling by car in order to, among other things, lower the investment cost for new parking facilities. Many measures were introduced to achieve the goal:

- Introduction of paid parking for all employees (and students)
- 100% refund of cost for public transport for all employees (and students)
- Stimulate home working
- Improvement of the bicycle facilities
- Bicycle parking
- Company bikes (e-bikes)
- Showers
- Financial subsidies for E-bikes and E-scooters
- Repair service on campus
- Improvement of travel information (personal travel advice, website, PT trial cards,...)

By doing this, the investment costs for new parking facilities were lowered by approximately €20 M and the use of car decreased both among employees and students.

## Local spotlight

### Norwegian University of Science and Technology, Campus Trondheim – Measures for the “Zero-growth goal”

In Trondheim, NTNU plans for a reallocation from eight sites to two, which means that the major campus will get over 14 000 new students and 1 750 new staff members over an eight-year period. At the same time, the city of Trondheim has goals to reduce local and global emissions and stimulate less use of private car. The collecting goal is called the “Zero-growth goal”. The reallocation and the goals set high demand on campus development, but also gives the chance to concentrate resources for sustainable mobility to one site. Following measures are used in the mobility plan for campus to reach the zero-growth goal:

- Reduced amount of car parking
- Road pricing
- Improved network and parking facilities for bicycles
- Improved network for walking
- Improved public transport

## 5.

### Step 5 – Prepare evaluation

The success of the campus mobility plan has to be proven. In this step indicators to measure the success should be identified. The indicators might cover:

- **Implemented measures** – what has been implemented by each stakeholder.
- **Effects** – for example on car traffic, modal split, number of parking spaces etc.
- **Process** – how successful has the working process been and what can be improved.

An evaluation framework should be composed and communicated to all involved stakeholders. The evaluation framework states why and what to evaluate, how to do it and when to do it, and also how follow-up events that will take place. The framework can be incorporated in the action plan.

#### Checklist 5

- Have you composed an evaluation framework?
- Have you informed all involved stakeholders about the framework?



## 6.

### Step 6 – Gain Approval

The most important phase of the process of developing a campus mobility plan is to gain signed approval from all the primary stakeholders to implement the selected measures. With a good participation in the previous phases it should be smooth, but still this phase should not be ignored and it is easy to underestimate the time for this phase. Follow these tips to avoid backlashes in the process of getting acceptance:

- **Invite stakeholders to have their say** and give opinions continuously over the development of the campus mobility plan.
- **Summarise findings** after stakeholder involvement and give feedback after decisions taken by the stakeholder group.
- **Be open with assessment analysis and cost-benefit analysis** to decision makers.
- **Inform about selected measures** beyond the primary stakeholders.

The overall target to create a campus mobility plan has been achieved when all the primary stakeholders have signed an agreement regarding their participation and initiation of the implementation phase.

The agreement should preferably be signed by the executive officer/principal/director of each stakeholder organisation. The reason is to force each organisation to anchor their responsibilities in the top management level. This makes each stakeholder participation less vulnerable and less dependent of the personnel participating in the development process.

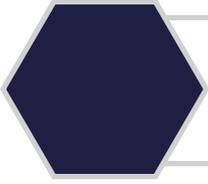
#### Legal arrangements and agreement

Since the legal framework differs between countries no detailed recommendation is given on this subject. In Gothenburg, the signed agreement for the campus mobility plan at Chalmers University of Technology has no legal status, instead it is built on trust between the stakeholders. This way of handling the agreement works well when all stakeholders clearly see their own benefits from implementing the plan. In other cases, it might be wise to attach the written agreement to legal contracts conducted between stakeholders in different stages of further campus development.

Regarding this, there is a strong recommendation to have a plan for the following steps in realising the development plans. The status of the mobility plan, the aim, objectives and the described measures, must be clear also later in the process. This is for ensuring that the further development consider the work that has been done composing the plan.

#### Checklist 6

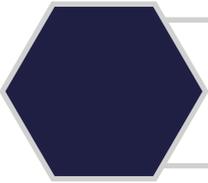
- Have all relevant stakeholders signed a written agreement to implement those measures stated as their responsibility?
- Are there legally binding contracts in the campus development process where the campus mobility plan and the written agreement should be attached?
- Is there a plan for how the mobility plan should be used later in the development process?



## Implementation

The implementation of measures described in the campus mobility plan is done by each stakeholder individually or in cooperation with several stakeholders or secondary partners.

There will certainly be situations where some of the selected measures cannot or should not be implemented due to new knowledge, changes in technology or public acceptance. This must be considered as satisfactory as long the responsible stakeholder suggests what else can be done to achieve the objectives. A dialogue for this kind of situations should take place in the evaluation forum (see next step).

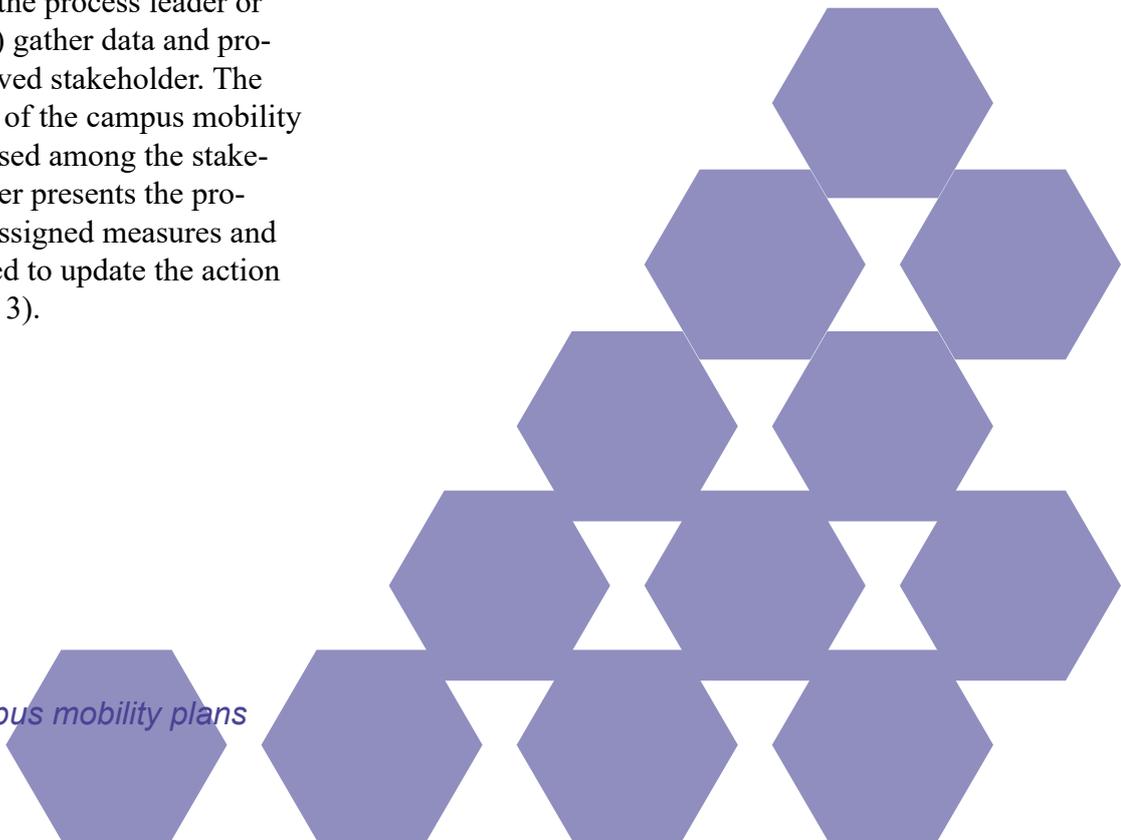


## Evaluation

After a while, when measures have been fully or partly implemented, it is time to gather all involved stakeholders for an evaluation of the progress. The form of the evaluation is described in the evaluation framework (step 5) where it should be stated when and how often the evaluation and follow-up events will take place.

Before the follow-up events, the process leader or the responsible stakeholder(s) gather data and progress reports from each involved stakeholder. The status of the general progress of the campus mobility plan are presented and discussed among the stakeholder group. Each stakeholder presents the progress of implementing their assigned measures and the information should be used to update the action plan table (see Step 4, Action 3).

These events are a good opportunity for composing informative material regarding the progress and the mobility status of the campus. Such material can be used by the stakeholders to promote the actions to gain goodwill among customers as well to promote the results internally towards the management section in order to secure resources for the implementation of planned measures.





### Local spotlight

**Chalmers University of Technology** – Upon the request to develop the campus area and increase the number of employees, the city of Gothenburg demanded a mobility plan as a mean to allow a change of zoning plan. The mobility plan together with a signed agreement from all involved stakeholders was part of the zoning plan process. In order to get a positive decision of the zoning plan, all stakeholders had to sign the agreement which included the objective and designated measures. The agreement was signed by the corresponding manager, principal or business executive as a way to get approval on management level and increase trust between the partners.

## Box 7 – Dos and don'ts

Things to keep in mind while creating a campus mobility plan.

### Dos

- Choose questions for your baseline pre-assessment carefully, make sure the results can be remeasured and compared in the future.
- Put effort in to describe the baseline. What you do not know beforehand is hard to evaluate afterwards.
- Communicate why the plan is developed. Communicate the expected results and the results from the evaluations.
- Evaluate also the process, not only the mobility-related indicators
- Do the evaluation continuously up to several years after first implementation of measures

### Don'ts

- Don't expect to gain all relevant knowledge for each measure during the process. E.g. technical and legal aspects might need to be investigated closer to implementation.
- Don't take the process and implementation of measures for granted. Be flexible and adopt along the way.
- Don't neglect to ensure validation from the involved stakeholder's top management
- Underestimate the time needed for validation of each stakeholder's responsibilities
- Don't make too complex structures e.g. regarding involvement of key-resources

### 3. Tools for the development of a campus mobility plan

This chapter gives inspiration and provides examples of tools and methods to use during the different steps in the process for developing a campus mobility plan.

#### Tools for data gathering

When gathering data and information the first thing to do is to list the required data and where or how to find it. Some useful organisations to contact are:

- **The city administrations** (or relevant public road authority) can usually provide information and statistics about infrastructure and road users, information on environmental quality, and information about land use planning and services in the area.
- **Transport providers** usually have information about ridership and available services.
- **Parking providers/owners** have information about fees, number of parking places and paying customers, customer complaints and sometimes also information about occupancy rate at certain parking facilities.
- **Property owners** can provide information about facilities, customer complaints, development plans etc.

#### Involve students and scientists

Beside gathering key statistics, it is important to consider the user perspective both when trying to understand the present situation as well as trying to develop solution for the future. The unique environment at a university campus gives two special opportunities.

#### Use the knowledge and engagement - students

Students are a source of knowledge (both user perspective and within scientific fields) that should not be ignored. The possibility to invite and involve students when developing a campus is valuable. A good starting point for the involvement is when it is time to define the mobility situation (baseline) but also when it comes to finding new innovative solutions and measures to tackle the challenges.

#### *Box 8 – Methods for gathering information and collecting data*

- **The use of parking places.** E.g. counting of number and occupancy rate, interview studies and dialog with property owners.
- **Modal share** is best measured through a travel survey – via a web questionnaires, on-site surveys or smartphone application.
- **Interviews** with persons that are administrating, working or visiting the campus.
- **Count traffic-flows** for different sections – from simple one-time ocular surveys (with low verification) to extensive traffic flow measurements (higher degree of verification)
- **Gather data** from relevant databases.

**Civitas tool inventory** is an online database with over 100 tools and methods that helps local authorities make better informed decisions about which planning tools to apply in their given local context. The database is the place to visit if you are searching for tools for measurements and surveys but also for tools applicable later in the process.



### Local spotlight

**Danmarks tekniska universitet (DTU)** - Students are always part of the user groups when new things are developed on campus. For example Pop-up student environments were evaluated by the students as a part of the process to develop new learning environments. Students will also be a part of the planned testing with Autonomous Bus Shuttles, where DTU in the summer 2019 will be testing with 3 busses running at campus. The students will be observed on how they use the busses and inquired about how they feel about riding with an autonomous vehicle. The students will also be involved in designing an app solution with the purpose of making the bus stop on their demand.

### *Box 9 – Students involvement*

The following can be useful to include when organising student involvement:

- To be successful, first answer the question why students would like to contribute.
- Sustainability is a popular topic which often engages students.
- Try to make the project feel like it is innovative
- Use trials and campaigns, e.g. hackathons, idea competitions and living labs.
- Hire students to perform easy tasks in the baseline study.
- If possible, put assignments related to the campus plan development in courses. This creates a possibility for interested students to prioritise involvement in relation to other responsibilities.
- Find out how the students are organised and use existing networks to spread information and get in touch with interested students.
- Consider offering rewards to the students for their involvement.
- Time is also scarce for students. Adjust the timeframe of activities to the flow of the students planning, e.g. avoid examination periods.

### **Use the knowledge and engagement – researchers and faculties**

There are many research areas that can be connected to campus mobility development. Different universities have different opportunities, and sometimes it is possible to use the knowledge and engagement of local researchers in the development of the campus mobility plan itself, implementation of certain measures or for evaluation of the progress and results. Some “keep in mind”-notes are presented in box 10.



### *Box 10 – Science involvement*

The following can be useful to include when organising science involvement:

Invite researchers in good time. They may need to be invited in to the process from the start to be able to make an impact on the outline.

Master theses may be a good way to get deeper knowledge about certain questions related to the mobility plan and its implementation.

Be open for the possibility to find and use synergy effects by involving departments/faculties that are not in the field of mobility.

Be open for the possibility to find areas for spin-of research.



### Local spotlight

**Danmarks tekniska Universitet (DTU)** - Living lab is often used to drive innovation in products and services, especially when both social and location-based aspects are important.

There are several so-called living labs at DTU Lyngby Campus, where research will be tested in everyday life by the people in the area. Development of Living labs on campus is very much a collaboration between Campus Service, as the facility management organization, and scientist from different departments on DTU.

One example is when the new mobility strategy was developed the Campus Service took in comments from scientist from DTU. Test for new parking principle was carried out by Campus Service; registrations was made, and comments collected from people parking on DTU. These findings will be taken into the planning process for the further planning of parking for cars and bicycles.

The scientists are also part of the working group around Autonomous Bus Shuttles for the Light Rail project as they are giving and providing hours to the project. Students and scientists are developing the app solution together with IBM APP Cloud Garage. The project involves scientist from different departments.

## Tools for communication and interaction

Cooperation and collaboration are a major key for the preparation and execution of a successful mobility plan. If stakeholders are well informed, if they are given the opportunity to influence the result and if they feel that they are participating on equal terms the chances increase that the plan will reach the vision and the objectives.

Meanwhile, the participation of a stakeholder demands engagement and a problem solving approach. To create a united base for cooperation, it is recommended to set up rules of engagement for stakeholders in the process. Examples of such rules are presented in box 11.

During the process of developing a campus mobility plan interaction and communication between stakeholders is key. One way to ensure interaction and communication is to gather stakeholders in workshops during the process.

### *Box 11 – Rules of engagement*

- Respect each other's professions, it's the different starting points among the stakeholders that creates joint long-lasting solutions.
- As long as it doesn't affect your organisation's business secrets and its standing in a negotiation, be straight with your organisation's interest and preconditions to participate and undertake responsibility for measures early in the process.
- Work continuously to gain approval internally for your organisations role and responsibility to fulfil the mobility plan. This reduces risk that the mobility plan won't be approved later in the process by some stakeholder.
- Be open to new ideas "outside the box".
- Communicate clearly regarding expected involvement from participating stakeholders.



## Box 12 – Workshop

A workshop is a means to make every stakeholder have their say and to collect necessary information from many sources. A workshop can be a platform for organised discussions to find suitable measures, reach an agreement etc. The method is only truly useful if the organiser searches for input and discussion with the participants.

The following steps can be used as a guide when arranging a workshop:

- Invite all involved stakeholders, try to find a balance between number of participants from each stakeholder.
- Define a clear purpose with the workshop and how it relates to the overall process.
- Define a clear agenda: frame – produce – summarise.
- Define a facilitator who owns the process, the participants own the content.
- Let every participant have their say in smaller groups. Let the groups summarise their discussion and let the facilitator summarise the findings from all groups.
- Have fun – encourage participants to solve challenges together and encourage and verify the outputs.
- Write big, use posters and walls to display outcomes and findings.



## 4. Endnotes

### References

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### Local Spotlight

Chalmers University of Technology – Å. Östlund, A. Eckerstig - Chalmersfastigheter; M. Djupström - Chalmers.

Technical University of Denmark (DTU) – A. B. Møller – Campus service

Helsinki University – M. Puttonen

Lund – J. Brinkfält, Akademiska Hus

Norwegian University of Science and Technology, Campus Trondheim - PowerPoint-Presentation 7/12/2017 P. A. Tefre - Trondheim commune

Erasmus University Rotterdam - PowerPoint-Presentation 12/9/2018- Giuliano Mingardo

