

D.T2.2.4 - Individual **Final** Pilot Report

Stuttgart Pilot on low carbon employee
mobility management

Version 1
12 2019





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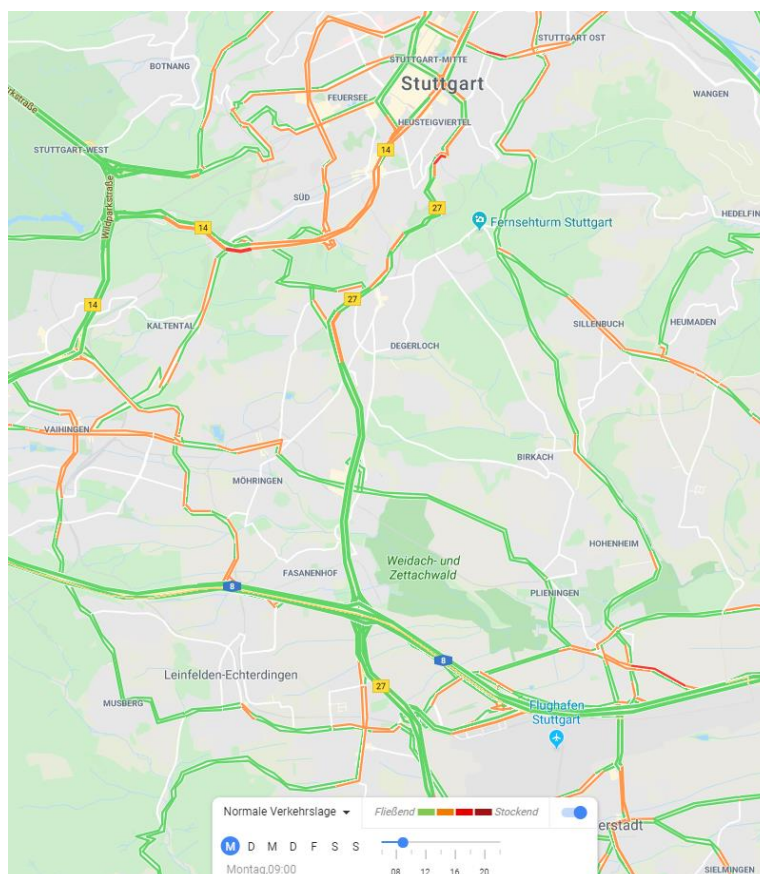
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1. Introduction

Stuttgart Airport is a traffic hot spot in the Stuttgart area. Tens of thousands of passengers travel daily by car or public transport via Stuttgart Airport to their destinations. In addition, the airport operation with several thousand employees induces commuter traffic around the clock.

Traffic congestion in conurbations leads to daily road congestion and at peak times to local emission limits for “Feinstaub” and NOx levels being exceeded. The region is under pressure to avoid these exceedances, as driving bans severely impair mobility, especially in Stuttgart.

Important players in the region have therefore formed an air quality partnership to work together to reduce transport-related emissions. Stuttgart Airport is a member of this alliance in order to make its specific contribution to reducing emissions.



2. Specifications of pilot

2.1. Constellation

Project partner, Wirtschaftsförderung Region Stuttgart GmbH (WRS) is cooperating with Stuttgart Airport (FSG) to organize a low carbon behaviour change campaign for employees of Stuttgart Airport.

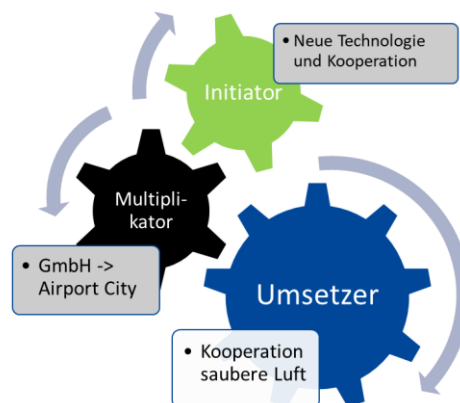
The cooperation is planning a workshop series to establish grounded and accepted sustainable employee mobility management measures in cooperation with staff in interdisciplinary groups from HR, workers’ committee, parking management, operations, executive management, administration etc. The aim is to plan and communicate a corresponding systematic mobility concept for employees of Stuttgart Airport and its campus.

2.2. Understanding

At Stuttgart Airport, FSG is actively involved in designing the transport infrastructure for employees and travellers. The airport company takes on various tasks to organise this interaction. In terms of mobility management, FSG takes leadership



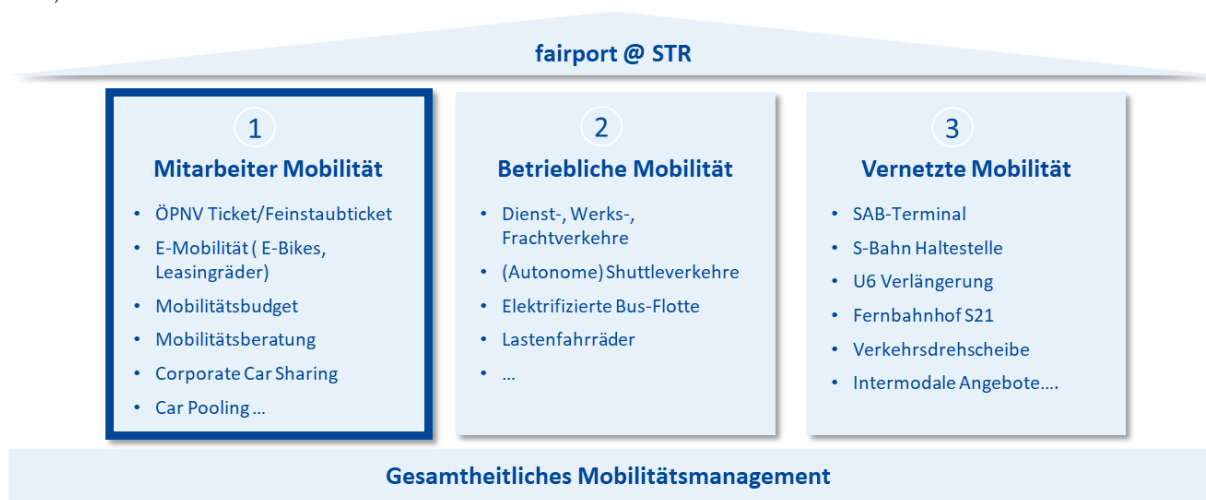
- as implementer of the requirements arising from the cooperation on clean air, but also as
- as a multiplier of meaningful (economic, traffic-relieving, location-attractivising) measures from one's own sphere of influence (vehicle fleet, employees, properties) to the other residents at the location, and
- as initiator of technologically or organizationally new approaches and successful cooperations.



2.3. Activities

The activities are currently being carried out in three fields of action:

- 1. Employee mobility "How do our employees get to work?"
- 2. Company mobility "How do we efficiently organize our business passenger transport by means of our vehicles?"
- 3. Networked Mobility "How do we create intermodal and multimodal solutions by integrating all available publicly accessible mobility services (public transport, sharing services, platforms etc.)?"





2.4. Method and Process

For the systematic approach for this complex topic, a consistent strategy will be developed in an interactive process involving the FSG and the subsidiary companies for

- prioritisation according to target contributions and leverage effects,
- reduce complexity,
- use of synergies

analyses about the mobility behaviour of the employees and feedback-loops with the steering group provides the basis for decision-making:

- quantifiable potentials,
- effectiveness assessments and
- comparative economic considerations.

In this way, gradually calculable measures were identified and highly effective solutions are developed, if necessary with the involvement of external professional mobility services.

As part of an integrated strategy for climate-friendly mobility around the airport, various target groups will also be considered in order to understand their individual mobility needs and traffic routines. With a realistic assessment of their potential for change to climate-friendly mobility solutions, the right measures can be developed and introduced.





3. Objectives and impact

3.1. Objectives:

- Reduction of CO₂-emission (it is in line with the FAIRPORT strategy from Stuttgart Airport)
- Promoting sustainable mobility options for Stuttgart Airport employees
- Enhancement of health and motivation of Stuttgart Airport employees
- Target value: in the long-term perspective, 20 percent shift from vehicle use to sustainable mode of transport¹
- Sustainability: Stuttgart Airport will continue with the employee mobility management strategy and extend strategy to the airport campus

The airport location is integrated into the complex traffic situation in Stuttgart and induces a high volume of traffic every day through its tens of thousands of travellers and thousands of employees at the location. The objectives thus interact with the influencing factors (drivers&barriers) of these 4 quadrants:



- A) Politics: reduktion of traffic and emission
- B) fairport-codex: CO₂-neutrality; sustainable goals
- C) alliances: comittment and cooperation with other companies in the area for clean air
- D) employees: change of the individual mobility behaviour (health&fitness)

3.1.1. Overall objectives-> Quality objectives:

- From the general traffic and environmental policy guidelines for the Stuttgart area (share of individual transport, modal shift, emission reduction, functionality), the quality objective of

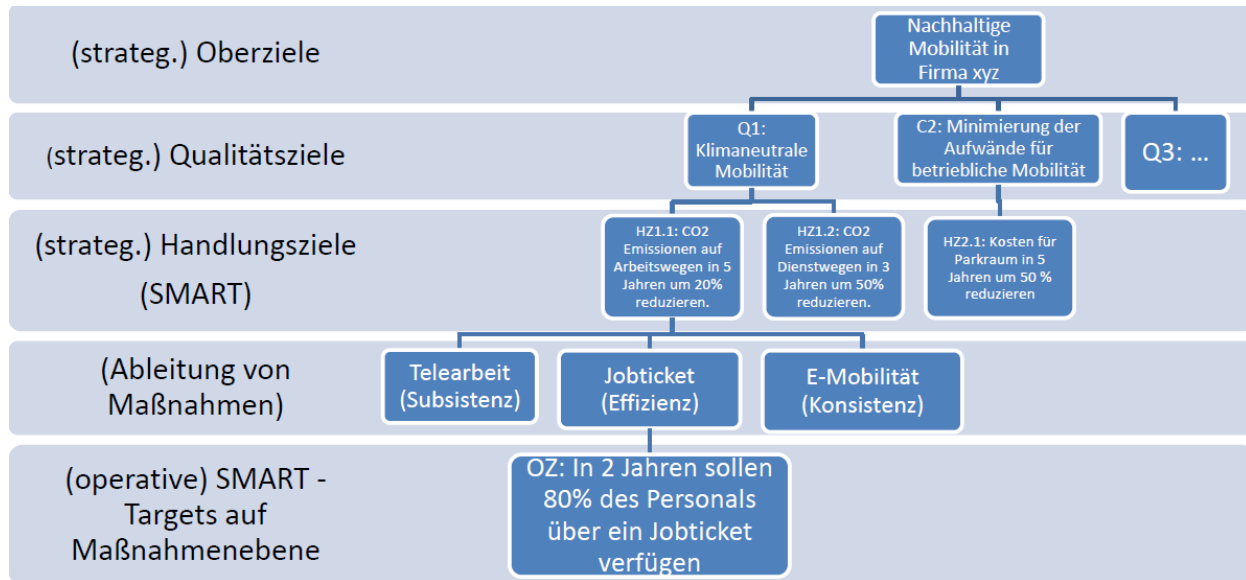
¹ According to S. Haendschke, ACE, expert for employee mobility management, 20% is the relocation potential of employee mobility management. That was identified during a relatively large project, called "efficient mobile" (efficientmobil), in 80 companies nationwide in Germany. Of course, this is an average value, which was achieved only after a complete implementation of a systematic employee mobility management - mostly not immediately after the workshops.



becoming a climate-neutral airport by 2050 is derived in correspondence with the general airport vision (cf. Fairport Code).

- Further motives for actively shaping the mobility situation at the airport stem from the claim to be an attractive employer (aspect of health promotion, good and convenient accessibility).

As a result of the further one-year strategy process, a consistent target system will be created according to the following model:



Level of Targets

- overall (sustainable mobility)
- of quality (climate protection, costs,...)
- of action (smart like emission, resources,...)
- of measures (quantity of implementation)

3.1.2. Smart operational targets:

- A modal split is planned for the time of completion of the underground and long-distance railway connection (2025?), after which 70% will arrive in an environmentally friendly manner. The obligatory public transport share is to rise to 45% of passengers.
- With regard to parking space, the construction of new multi-storey car parks is to be avoided through efficient management.

3.1.3. Explanations and comments from the discussion:

- The strategic quality objective of a climate-neutral airport in 2050 could prove more urgent in view of the intensified climate debate. According to those responsible for external communications, it still seems irrelevant for passengers at present (cheap, fast - no special quality in check-in and no environmental motives). Munich Airport has already declared this goal of climate neutrality for 2030, and may be focusing on increasingly important location image aspects.



- The current modal split among travellers is 90% car ownership. The share of passenger cars among airport employees is 41-68% (32% always commute by public transport). The employee modal split should be above the class target of 70% in order to compensate for the weaker modal split of travellers

Mitarbeiterbefragung 2018 – Status Quo



- 27% der Arbeitnehmer nutzen den ÖPNV zwischen 3-10 Mal/Monat
 - Davon nutzen ca. 87% neben dem ÖPNV den PKW für den Arbeitsweg
- 41% der Arbeitnehmer kommen nie mit dem ÖPNV zur Arbeit

- 27% of employees use public traffic 3-10 times per month, but also their cars (87%of them); 41% never use public transport
- The goal for action with regard to parking space management has not yet been operationalised (-> efficient use, avoidance of new multi-storey car parks). In connection with the expected mobility bottlenecks at the commercial area in the neighbourhood (Synergiepark Vaihingen) due to the arrival of further companies (15000 employees) at the end of 2020, additional parking pressure could arise (-> renting of parking spaces at the airport).
- There is also an inconsistent picture of the benefits that various employees expect and appreciate in the future with regard to the claim "attractive employer".
- With regard to mobility costs, the provision of free parking spaces in the FSG multi-storey car park for commuters including subsidiary companies is regarded as a central benefit (preservation of vested rights, full costs are not known). Parking space management is therefore avoided.
- With regard to convenient accessibility, public transport offers hardly any suitable services for shift workers in off-peak times. (Utilisation of the S-Bahn interval, which has been brought forward by one hour, has not yet been reached.)
- Other conceivable overall objectives from the areas of image or environment management have not been dealt with so far or are not relevant from the point of view of external communication.



4. Insights on analysis/developments of Key-Performance-Indicators (KPIs)

An analysis of the residential locations of the 1060 employees was used to determine the theoretical potential for alternative options of transport between the place of residence and the place of work. The regular distance ist 23,79 km. The emission of the 1060 employees would be 3.8 to CO2 per day, if all of them would drive by car.

| Zahl MA* | Pkw Entfernung Gesamt | Pkw Entfernung Durchschnitt | CO ₂ -Ausstoß gesamt | CO ₂ -Ausstoß Durchschnitt |
|------------------|-----------------------|-----------------------------|---------------------------------|---------------------------------------|
| 1060 (von 1070)* | 25.218,97 km | 23,79 km | 3.858,50 kg | 3,64 kg |

Mitarbeiterwohnorte Flughafen Stuttgart – alle 26% der MitarbeiterInnen wohnen in Zweiradentfernung

E c o  **Libro**
strategische und operative Mobilitätsberatung

| Entfernung (km) | Anzahl Mitarbeiter (Pkw Entfernung) | Anzahl Mitarbeiter (Pedelec Entfernung) | Mitarbeiter kumuliert (Pkw Entfernung) | | Mitarbeiter kumuliert (Pedelec Entfernung) | |
|-----------------|-------------------------------------|---|--|--------|--|--------|
| | | | Anzahl | Anteil | Anzahl | Anteil |
| 0-2 | 3 | 6 | 3 | 0% | 6 | 1% |
| 2-5 | 58 | 100 | 61 | 6% | 106 | 10% |
| 5-10 | 165 | 175 | 226 | 21% | 281 | 26% |
| 10-15 | 147 | | 373 | 35% | | |
| 15-20 | 155 | | 528 | 49% | | |
| 20-30 | 218 | | 746 | 70% | | |
| 30-40 | 161 | | 907 | 85% | | |
| 40-50 | 72 | | 979 | 91% | | |
| 50-80 | 70 | | 1049 | 98% | | |
| >80 | 21 | | 1070 | 100% | | |



Only 10% of the employees could use cycles for commuting (distances up to 5 km). 26% (281 persons) of the employees could use cycles or ebike (distances up to 10 km).

The following maps show the residential locations of the approximately one thousand FSG employees. The number in the flags shows the route on the street, (not the direct distance). Furthermore, the subsidiary companies are analysed and specific maps are produced for shift operations (early and late times and for normal working hours, because the different traffic situations (local public transport intervals and congestion) can be mapped and, if necessary, the advantages of certain means of transport for certain groups of employees could be shifted.

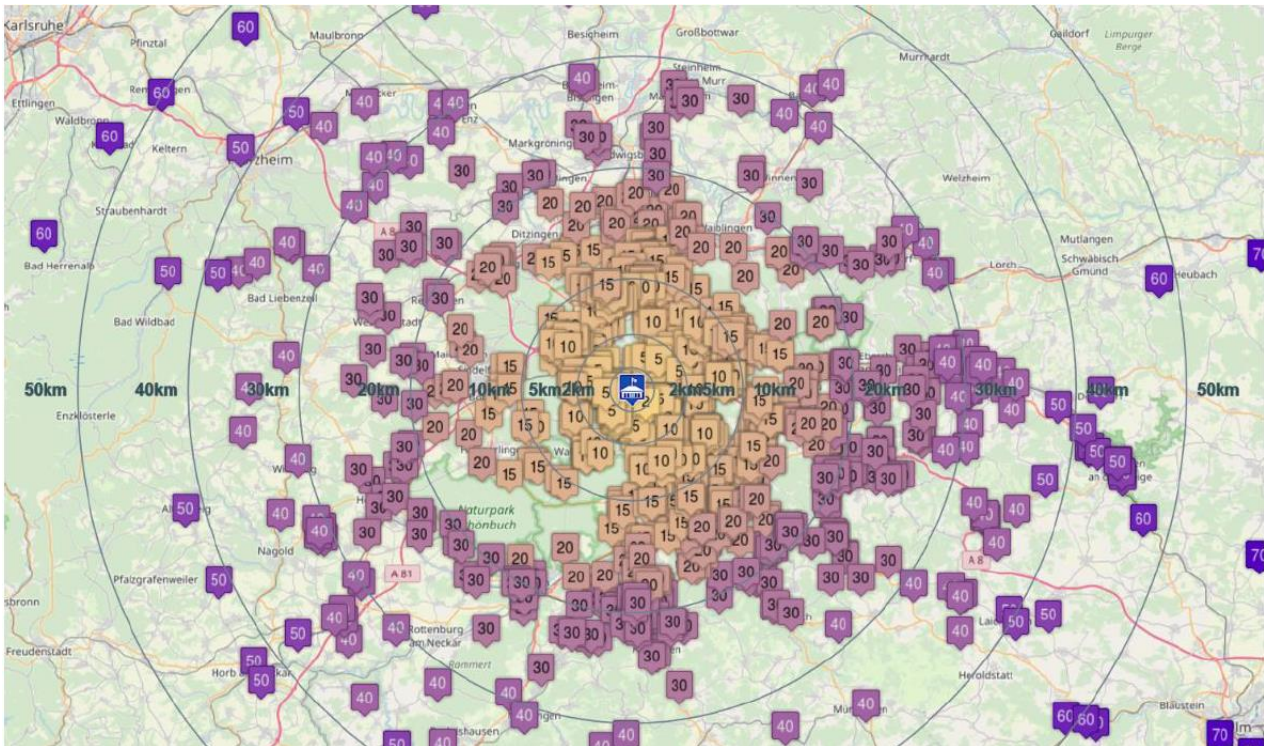
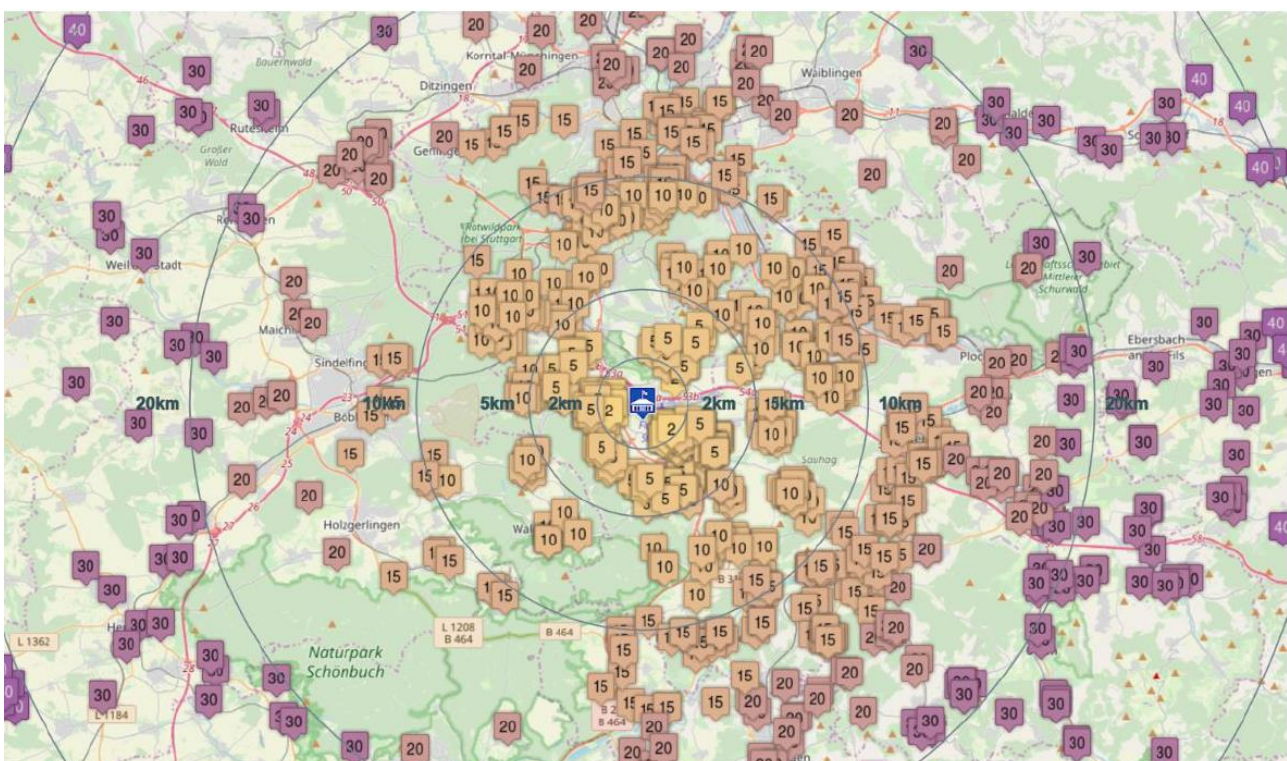
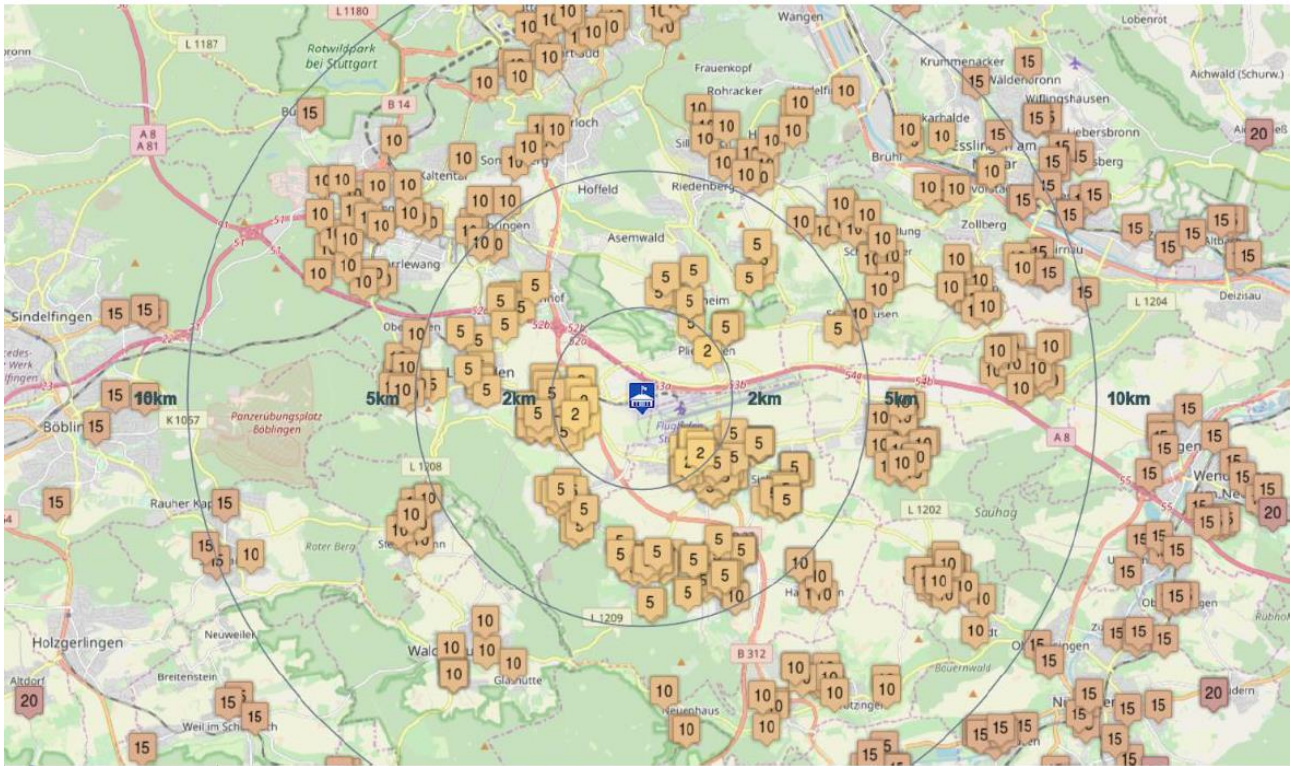


Figure above: 50 km area; figure below: 30 km area;





10 km area:

A commuter distance of up to 10 kilometers (see the number in the flags) could be covered with the ebike, which corresponds to 281 employees.



5. Insights on survey results

5.1. Potential for modal shift

Surprisingly few employees live within cycling distance.

For the bicycle (including ebikes), it can be predicted that of the 280 possible employees, perhaps 30% of them can be mobilized. Hopefully we will be able to derive this quota from the employee survey. The evaluation is not available yet.

If we want to think about FSG's own bicycle parking facilities and subsidy, we could estimate 100 potential cyclists/bikers for the time. In terms of emissions the impact will be small, because it is the short-distance commuters and only 10%.

The relevance with regard to the whole bicycle impacts from all companies at the airport may become better, if the FSG daughters are also evaluated.

Regarding the improvement of the bicycle infrastructure we have to think again whether and how this could be relevant for the passengers (lockable folding bike/ pedal boxes as offer for business travelers from 1-3 days).

5.2. SWOT

| | |
|---|---|
| <p style="text-align: center;">Strengths:</p> <ul style="list-style-type: none"> • All local modes of transport road connection, S-Bahn, bus are available • Cycle path connection is ok but condition at the airport area is suboptimal (currently cycle path concept) • Public transport is cheaper than before • Good cooperation FSG with subsidiary companies. • Twogo carpooling App is existing | <p style="text-align: center;">Weaknesses:</p> <ul style="list-style-type: none"> • overloaded car access roads • Public transport times in need of improvement especially for shift times • Company car only up to director level • Poor and unknown cycle path connection on terrain (cut up) • Jobticket only VVS not for the neighbour area (Waldo) • Cycling action day only once a year • Twogo carpooling brings too little movement, many working time models • No individual mobility counselling |
| <p style="text-align: center;">Opportunities:</p> <ul style="list-style-type: none"> • Increasing CAMPUS cooperation concept • Public transport: In the future also subway and mainline station • electrification • E-bus air conditioning, • Charging stations not yet fully utilized • Autonomous shuttle services • digitalisation (i.e. monitors for information) • parking app shows free parking spaces to avoid search traffic • Fz pool software from 2020 • FSG-app supports travellers when arriving at the airport and provides general orientation • Personnel increase | <p style="text-align: center;">Threats:</p> <ul style="list-style-type: none"> • driving bans • Danger on-call duty with diesel car. • Shortage of parking space • Rental of parking space from other external companies etc. |



5.3. Requirements for an integrated approach

In order to lead the measures to success, the interaction of different components is necessary:

- Employees and travellers must have user-friendly access to different transport offers / means (information transparency, technical availability and economic attractiveness).
- The infrastructure must fit the entire route (door-to-door), i.e. both on the airport premises and in the surrounding area.
- Cooperation with various responsible actors is required (municipalities, local businesses on the site, administration and planning authorities, mobility service providers, PPP).

5.4. Requirements for cooperation: Network Airport City

From network meeting to network living

- A network meeting, which is coordinated by the FSG, serves to integrate the other residents at the airport location. As many residents as possible are to be integrated into this network.

Explanation and comments:

- At the first network meeting approx. 30 % of the companies were present. It can be assumed that many have not yet recognised the benefits for attending.

Exploiting synergies in the network

- It will meet at least once a year to discuss overarching transport and mobility management issues. In the current intensive phase of the FSG strategy development, further meetings are foreseeable if necessary.

5.5. Current topics and ideas for cooperation topics

Employee survey

- Distribute current employee survey (synergy park) as widely as possible.

Public transport

- mutual updates, because construction sites will impair operations in the coming years.

Shuttle traffic, ride-sharing

- Shuttle and carpool buses could bundle inter-company employee (shuttle) traffic.
- Active promotion of the ride sharing app (two go) across company boundaries to extend the critical mass of users

Car-sharing

- Corporate approach (Inter-company networking, meta-pooling)

Parking development/smart charging:

- At present the demand can be met. Currently no further demand can be identified.



- The provision of charging infrastructure can be designed jointly. What demand is to be expected, when will the billing issue be resolved?-> smart charging

Communication, incentives:

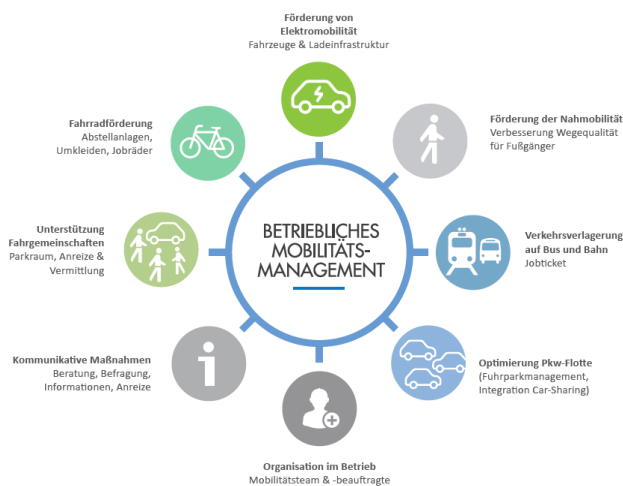
- Joint Mobility Days / Linking up with the health theme

5.6. Current considerations for measures and open questions

The project is at the beginning. We will check all options to integrate in the mobility strategy:



There are technical measures (bicycle promotion and electric drives) but also soft measures with which the behaviour of employees can be influenced, such as information and incentives.



Here are three first measures we try to realize next year (2020):

5.6.1. Information monitors

- for passengers
- for employees

here you find an example, which is implemented at Berlin airport. Passenger and employees can use it for realtimeinformation to compare different options of public transport. For employees you could integrate carpooling.

Verkehrsübergreifendes Informationssystem am Flughafen Tegel gestartet

06.05.2014



Um ankommende Passagiere noch besser über die aktuelle Verkehrssituation rund um den Flughafen Tegel zu informieren, wurde jetzt das AIRport bezogene VerkehrsInformationssystem – AIRVIS – in Betrieb genommen.

In der ersten Ausbaustufe wurden Informationsmonitore in den Ankunftsbereichen der Terminals A und E sowie im Mietwagencenter installiert. Dort erhalten Reisende Informationen zur aktuellen Verkehrssituation im Straßennetz von Berlin und Umgebung. Weiterhin können sich Fluggäste, die mit den öffentlichen Verkehrsmitteln weiterreisen, auf einen Blick über den kürzesten Weg zu den Bushaltestellen sowie die aktuellen Live-Abfahrten der Buslinien in die Berliner Innenstadt informieren. Bei Störungen im öffentlichen Personennahverkehr und im Individualverkehr, werden über eine Fließtextzeile die jeweiligen Einschränkungen beschrieben und mögliche Alternativen vorgeschlagen. Das System wird in den nächsten Monaten weiter ausgebaut.

Im AIRVIS-Projekt werden alle relevanten Daten und Informationen aus Berlin und Brandenburg, insbesondere der Leitstellen des Flughafens, der Verkehrsinformationszentrale (VIZ) und des Verkehrsverbundes Berlin Brandenburg (VBB) in einem Datenpool zusammengeführt, um so eine aktuelle, umfassende und konsistente Verkehrslagebeurteilung zu gewährleisten.

http://www.avt-consult.de/index.php?option=com_content&view=article&id=74&Itemid=57&lang=en

5.6.2. Promotion of bicycle transport

- As personal bicycles, folding bikes, pedelecs, electric pedal scooters, electric scooters)
- As service bikes (load bikes, bicycles, folding bikes, pedelecs, electric pedal scooters, electric scooters)
- Improvement of bicycle infrastructure on the site and in the surrounding area (connections and quality of paths, parking facilities)

5.6.3. Introduction of a mobility budget

- For company car owners (integrating downscaling of the car and other mobility offers)
- For additional employees (equal mobility opportunities or preference for climate-friendly solutions)



6. Learnings

6.1. Success factors

- The FSG management has recognised the importance of employee mobility management for the future design of mobility at the airport and supports the project with resources and personnel capacity.
- The contact person Mrs. Haas is legitimated by the management to carry out the project and is doing so very successfully.
- With a start workshop it was possible to initiate a mobility team within the FSG, which will continue to support the integrated implementation, to bundle the people who are responsible and can promote the ideas in their specific networks/business units.
- The assignment of experts (B.A.U.M. Consult and EcoLibro) professionally supports the project (analyses, moderation, development of measures) and the mobility team until End of 2020.

6.2. Failure factors

- Responsibilities for different mobility issues, like jobticket, carpool, bicycle infrastructure, are very widely distributed within the FSG organisation and its subsidiaries. This delays the processing.
- The analysis processes were held up for a long time by data protection declarations.

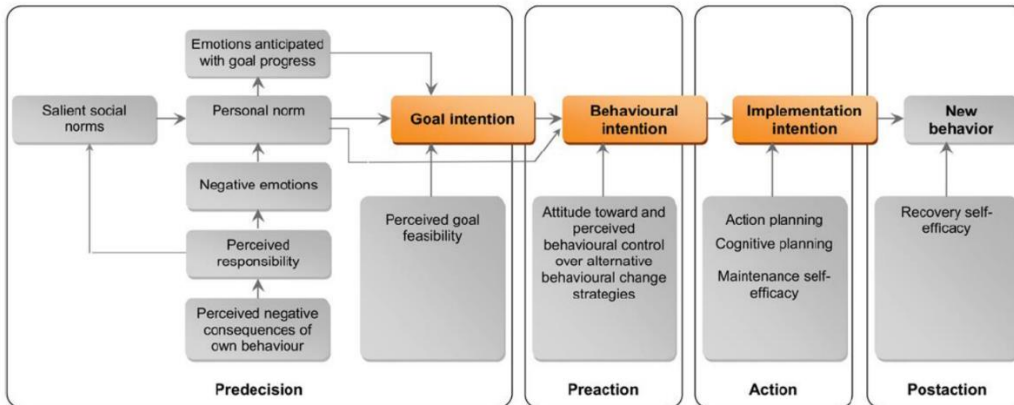
7. Conclusion

For a step-by-step evidence-based development of a mobility strategy and its implementation, an iterative plan with analysis and moderation phases for a period of one year was drawn up. The first analyses show that it is important to quantify the potentials so that no stranded investments happen. In the specific case, due to the relatively small number of employees within cycling distance, the relocation effect and thus the reduction in emissions through bicycle traffic should be classified as low. Without an analysis of the residential locations, this potential might have been overestimated and the prematurely too extensive offers would not have led to an adequate modal-shift result.

The project will continue for 2020 and 2021 with a mix of analyses, feedback loops and development of measures. Performance is very important for the Airport Stuttgart. We will focus at first on the low hanging fruits /quick wins to show efforts in reducing emissions. On the long run it is important that all measures will fit into an integrate concept, which brings all mobility options together in one green mobility policy. The so called mobility budget should be the perfect instrument for offering this as an incentive package.

For changing the mobility behaviour of the employees, we have to consider

- It is a long-term run
- We need push and pull instruments to lead us to “green deals”
- We need transparency in the policies and incentives
- We need role models, who live the new behavior
- We have to design a sequence of intentions (see next picture of the “A stage model of self-regulated behavioral change S.Bamberg 2013)



BAMBERG, S. (2013): Changing environmentally harmful behaviors: A stage model of self-regulated behavioral change. *Journal of Environmental Psychology*, 34, 151-159

In terms of sustainability, the project is seen as part of the Fairport strategy. An action plan alone does not create change. The FSG with B.A.U.M. Consult and EcoLibro will therefore actively support the transformation process until the end of 2020 and beyond.