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SHARED MICRO DEPOTS FOR URBAN PICKUP AND DELIVERY

FROM IDEA TO IMPLEMENTATION

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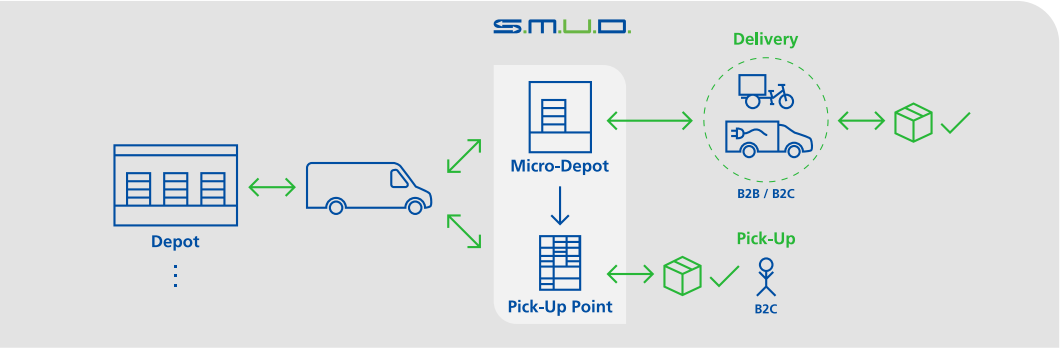
WHAT IS S.M.U.D.?

A micro depot is basically an interim storage facility in the city and more precisely in the area of delivery. Due to walkers and cargo bikes' limitations of range and load capacity, the last mile is divided into two steps with an additional transhipment at the micro depot. The supply is carried out by heavy goods vehicles and the final distribution leg to the consignee starts at the micro depot and is handled by environmentally friendly vehicles or walkers.



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A S.M.U.D. (Shared micro depot for urban pickup and delivery) is a special type of a micro depot shared by multiple companies. It can either be a parcel transhipment point and/or a pickup-delivery point. Parcel lockers and other auxiliary businesses may also be physically present at the micro depot to give more value to the surrounding residents and to improve the profitability of the S.M.U.D..

From the idea to the implementation of a shared micro depot, the four essential phases were identified. These phases should not be executed sequential but rather parallel and iteratively:

01 INITIATION

STARTING WITH AN IDEA AND IDENTIFICATION OF RELEVANT STAKEHOLDERS TO OPERATE A SHARED MICRO DEPOT

Initiation describes the phase in which the idea of implementing a shared micro depot as a concept of urban logistics is created and first preparations start. This includes the consideration of which type of micro depot is to be implemented, which stakeholders are relevant, what is feasible and which permits have to be obtained.

Contact: Brainport Smart District, City Helmond, Forum Virium Helsinki, SWM/MVG

STAKEHOLDER WORKSHOPS

To gauge the interest of logistic service providers (LSP), retailers and urban residents and to understand what is needed for the implementation and operation of a S.M.U.D., an intense stakeholder dialogue is required. These workshops should be held as early as possible to involve the relevant stakeholders in the planning and design process.

- Involve stakeholders as soon as possible
- Non-discriminatory communication with interested companies
- Location and accessibility of the S.M.U.D. are very important

PERMISSIONS

An important aspect in the preparation for the implementation is to obtain the necessary permissions, like building permissions, temporary operating permissions or fire safety clearings. These permissions vary from country to country and depends on the plannend usage of the depot.

- Permissions should be applied for as soon as possible
- An active contact with the city should be established
- In case of lacking experience, acquiring permissions may take a long time (up to 1 year)

02 **CONCEPTION**

DESIGN AND PLANNING OF ALL RELEVANT ASPECTS FOR IMPLEMENTING THE SHARED MICRO DEPOT

The conception phase includes all planning up to construction and starting business. This means finding a suitable location as well as planning the design and other technical requirements for the shared micro depot. In addition, an operator concept must be developed.

LOCATION PLANNING

The main purpose of micro depots is the support of efficient transhipment of goods for pickup and delivery. Therefore, the optimal location will increase its usage significantly. A methodology for location planning was developed and described along the example of the City of Munich but it can be transferred to other cities easily. The process of location planning can be separated into five main steps: specify goals, data acquisition, model setup, optimization of locations and refining locations.

- **Location planning should involve software tools, but local expertise is essential**
- **Good data quality is necessary to receive good results**
- **A network of shared micro depots can be developed stepwise by adding more depots by growing demands**

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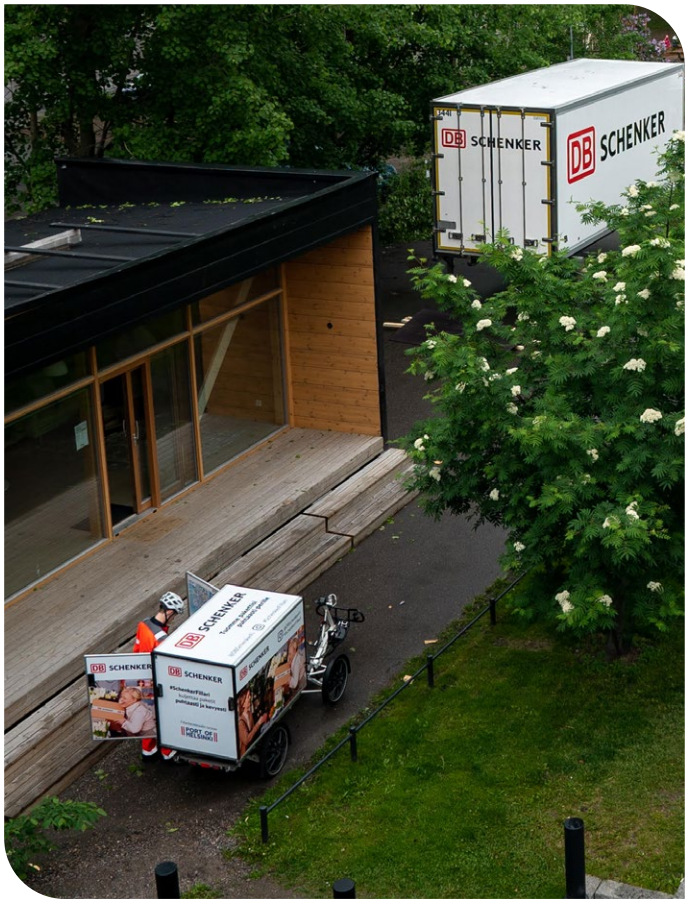
Contact: Fraunhofer IML



S.M.U.D. pilot testbed Helsinki (© Emil Kylämarkula)

BUSINESS MODEL

The business model describes a range of formal and informal aspects of a business itself. It can be seen as the explanation of the way businesses create, deliver and capture value in economic, social and cultural contexts. Therefore, requirements, limitations and regulations have to be analysed and brought to one model that provides value to its customers at appropriate costs. To have a consistent, common point of planning, the question of the shared micro depot's operator should be considered at an early stage. Potential operators are local authorities (city) or third-party companies managing the entire operations. However, the S.M.U.D. could be run on behalf of all the cooperating logistics companies, as well. Evaluating the advantages and disadvantages with the stakeholders helps finding an appropriate solution of operation.

- **Analysing and involving stakeholders is of major importance**
- **Local needs, demands and requirements have to be considered in the business model**
- **Considering regional/local LSPs to work together**

Contact: CIMNE, Technion

DESIGN

The first step of designing a shared micro depot is defining its location. The choice of the location may differ because of aspects like availability of space or the position in the public space. The scope should not only be focused on a logistical optimization – but be convenient with its urban environment by analyzing the possibilities the location may offer. The following steps are required in the design process: Assessing the quality of the location, defining the necessary or possible size of the S.M.U.D., defining the needs, reviewing local regulations and restrictions as well as incorporating possible extra features.

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- **Early involvement of all relevant stakeholders**
- **Continuous exchange with cities and stakeholders**
- **Design process should start by the definition of location**

Contact: Gateways

The two figures show the possible designs for a shared micro depot in Helmond and Helsinki.

03 IMPLEMENTATION

START OF BUSINESS OPERATION AND TRANSFER TO REGULAR OPERATION

After all planning and design steps have been completed and the S.M.U.D. has been set up, the implementation can be initiated. For example, this can initially be rolled out as a testbed with special permissions and a pilot operation with containers or the micro depot can be implemented directly in an existing or new property. Within the framework of S.M.U.D., the planning of two implementations was envisaged. In addition, the experience of the Quartiersbox in Munich was also taken into consideration.

- **Execution as a pilot operation or implementation in an existing property**
- **Starting with a pilot operation offers the possibility to evaluate impacts and readjust the concept**
- **Monitoring the implementation phase is important**

Contact: Brainport Smart District, City Helmond, Forum Virium Helsinki, SWM/MVG

04 ASSESSMENT

EVALUATION AND IMPROVEMENT OF THE SHARED MICRO DEPOT

During the operating phase, a continuous monitoring should be carried out, especially in case of a pilot operation or at the beginning of a permanent operation of a S.M.U.D.. Therefore, the economic as well as the environmental and social impacts should be considered. In addition, relevant stakeholders should be involved at an early stage and a communication strategy which is comprehensible and transparent for all stakeholders is recommended.
To outline the advantages and disadvantages of alternative last mile delivery concepts such as the S.M.U.D., one may use key performance indicators such as:

- **Reduction of emissions of greenhouse gases, air pollutants and noise**
- **Increase of road safety**
- **Share of low or zero emission deliveries**
- **Reduction of congestion in the urban area**
- **Level of stakeholder acceptance**
- **Level of logistics costs optimization**

Contact: Fraunhofer IML, CIMNE, Technion

For further information from the project, please contact the project partners mentioned in the topics.

S.M.U.D. IMPLEMENTATIONS

Within the framework of S.M.U.D., the planning of two implementations (one each in Helmond and Helsinki) was envisaged. In addition, the experience of the Quartiersbox in Munich was also considered.

HELMOND

The Brainport Smart District is a smart city district in Helmond (Province of Noord-Brabant), that focusses on participation, health, data, mobility, energy and circularity. It combines smart living and an ample amount of green space with working areas and is based on a process of co-creation of professionals, stakeholders and residents. As the BSD is still in the process of planning, 2021 at the earliest, the first residents are expected to move in. Participation of citizens and logistic partners has been organised. Therefore, the design and location for a S.M.U.D. is advised. The use of bikes for delivery is starting point in the entire area, but the business model for a S.M.U.D. in the Brainport Smart District-area is still under construction.

The new-to build area Brainport Smart District in bird-perspective (© Buro UNSTUDIO)

HELSINKI

S.M.U.D. pilot testbed Helsinki (© Emil Kylämarkula)

The city of Helsinki opened its shared micro depot as the first S.M.U.D. testbed on the 9th of June 2020. It consists of one building / cottage for 24/7 open parcel locker and two containers for operations of the cargo bikes. Parcels and magazines are delivered to the S.M.U.D. in the morning and distributed throughout the day on cargo bikes. The cargo bikes are loaded in the S.M.U.D. and drive their route during the day. Consumers can pickup their parcels whenever they want.

MUNICH

The SWM/MVG Quartiersboxen at the Westkreuz mobility station and in Neuaubing in Munich are pickup stations that are supplied by a cooperation partner. At the same time, the compartments of the Quartiersbox can be booked for a defined period of time and items can be stored. These can either be picked up by the recipient or removed by other recipients by passing on the code independently. Local businesses can also place their products in the Quartiersbox, thus enabling their customers to collect them 24/7. During the S.M.U.D. project, the business model of Quartiersbox was modified to include parcel delivery. The location planning process was conducted for Munich and will be the basis for a further roll-out of Quartiersbox in Munich.

Quartiersbox Freienfelsstraße/Munich (© Stadtwerke München GmbH)

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BRAINPORT SMART DISTRICT
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