Executive Summary DenCity

The DenCity Project is a collaboration project between 21 organisations that develops innovative solutions for sustainable passenger and freight transport in dense urban areas, with high demands on transport efficiency, attractiveness, accessibility and sustainability.
DenCity is a collaboration project between industry, academia and the public sector. The project is coordinated by the Swedish arena for collaboration within transport efficiency, CLOSER, at Lindholmen Science Park. 50 % of the project is financed by the Swedish innovation agency, VINNOVA within the UDI-program and the remainder by the participating partners.

**PROJECT PARTICIPANTS**

Volvo Group  
Chalmers University of Technology  
CLOSER at Lindholmen Science Park  
COOP Logistics  
Ericsson  
Fesiflo  
Göteborgs Frihamn AB  
City of Gothenburg Parking Company  
City of Gothenburg:  
Urban Transport Administration  
Department of sustainable waste and water  
City Planning Authority  
University of Gothenburg:  
School of Business, Economics and Law  
PostNord  
RISE Viktoria  
Schenker AB  
Sustainable Innovation  
Swedish Digital Trade Federation  
Volvo Cars  
Region Västra Götaland  
Älvstrandens Utveckling
AIM AND SCOPE OF THE PROJECT

The DenCity project has taken on a specific challenge – urbanisation – to develop transport and mobility solutions for future dense urban areas. The urbanisation implies an increased competition for the attractive urban space as well as increased impacts on environment and human health as more people and goods will need to be transported using the same infrastructure. During 2.5 years, the DenCity project has jointly developed, tested and evaluated innovative solutions for future, dense cities - opening up for business opportunities and scalable solutions both nationally and internationally. More specifically, the project has developed electrified distribution trucks, solutions for transporting goods and waste on urban waterways, service development for both passenger mobility and last mile deliveries, as well as planning for needed physical and digital infrastructure. The overall objective is that the developed solutions will result in reduced congestion and environmental effects, new products and services as well as increased quality of life.

Decisions made within urban development processes have a direct effect on transport of both people and goods. Traditionally, freight transport is not included in the urban planning process to the same extent as passenger transport. As the way of planning cities is changing, it becomes more and more important to take a holistic perspective on transport and to include all different modes of transport, for people, goods and waste. As an example, cities are now planning for a lower number of trips with private cars in favour of public transport, biking and walking, which implies the need for more home deliveries and other services. Cities are dynamic places, and we are in the middle of a rapid transition period where new technologies and services (digitalisation, automation, connected solutions and electromobility to mention a few) are altering the transport sector, as we knew it with strong implications for transport pattern in urban areas.

The densification of cities leads to complex challenges related to transport but at the same time, it enables new forms of collaborations to test and develop innovative solutions and processes to integrate new, smart solutions into urban planning. In the DenCity project, actors from city- and transport planning authorities, transport providers, transport buyers, OEMs, IT-industry, start-ups, real estate developers and academia developed solutions in close collaboration, integrating their different perspectives and experiences. This unique approach - integration of goods- and passenger mobility in demonstrations and urban planning processes - increases the chances of succeeding.

One of the key targets of DenCity is to consolidate the more and more fragmented urban transport operations and to develop transport solutions that integrate goods (incl. waste) and passenger transport, which offer a high quality of service to receivers, are efficient (in terms of space, time and resources) and sustainable (in economic, social and environmental terms). The developed solutions focus on the entire urban transport chain and take their starting point in solving the “life puzzle” for people living and working in cities. This integrated approach can help minimising the need of private car ownership through smart mobility- and logistics solutions, developing broker solutions for mobility and delivery services utilising the same digital and physical infrastructure.
RESULTS

Taking its starting point in the vision and challenges of one of the largest ongoing urban development projects in Scandinavia, RiverCity Gothenburg, but with focus on scalable and generic solutions, the project has developed, tested and evaluated the following solutions:

- **Zero Emission Distribution:**
  Electric vehicles for distribution of food in cities, opening up for efficient zero-emission deliveries in terms of noise, emissions and particles and enabling new ways of delivering goods, for example silent deliveries during off-peak hours which means more space for people during the day.

- **Urban Waterways:**
  Development and test of a multimodal transport chain including barge, cargo-bike and small electric vehicles in order to make use of the largely un-utilized infrastructure (waterways) in Swedish cities.

- **Enabling Infrastructure for Dense Cities:**
  - Digital platform integrating mobility and delivery services for people living and working in dense urban areas
  - Business model and blue-prints for a City Consolidation Centre (CCC), servicing an entire urban area with consolidated goods and waste transport
  - Development of mobility solutions and their integration in the urban planning process

- **Urban Deliveries and Services:**
  Development and preliminary testing of a last/first mile distribution concept enabling consolidated e-commerce parcel flows by use of a neutral delivery infrastructure in real-estates.

- **System integration and effects:**
  Integration of the different solutions into a collective transport system as well as integration of freight into the urban planning process. Collective solutions require an urban logistics infrastructure, which in turns requires an urban planning process, which takes the long-term development plans into consideration.

During the initiation phase and second phase of the DenCity project (run between 2015-2018) it has become clear that the different professions involved, in this case city planners, traffic planners and freight professionals are traditionally working in “silos”, with little or no interaction. The collaboration arenas that projects like DenCity provide, is one way of opening up the borders between different authorities and involved organisations, increasing the knowledge sharing, creating a dynamic collaboration environment and, in the long run, enable more efficient planning. Furthermore, innovation projects where several actors are involved and together implement innovative solutions, contribute to increasing the awareness. In the second quarter of 2018, the Swedish Government published a Strategy for Liveable Cities - Politics for Sustainable Development in Cities - a strategic document including efficient freight transports in cities and referring to the coming national freight strategy. Freight is now increasing in appearance on the urban development agenda!
Overall, the project and its developed solutions have raised a lot of interest from different actors, which in itself indicates that the targeted problems as well as the proposed solutions are relevant and feasible to implement. The DenCity solutions are at a different technology-readiness-level but no major obstacle has been observed. From a system perspective, it is clear that the solutions benefit from not being developed in isolation, and in particular that an integrated city and transport planning, involving multiple types of actors, is needed to develop efficient solutions. However, such a way of working does not happen overnight, but this project hopes to contribute to this development. The challenge for cities is to implement a physical planning that enables new technologies and services, and stakeholders from academia and industry must together with the cities show how these technologies and services can be used. In order to do this, demonstration of new solutions and business models for urban mobility is an important part of the transition to a sustainable system as it provides valuable information to involved actors.

By performing successful demonstrations combined and in small scale, this project has shown that it is feasible with new alternative solutions to meet the need of sustainable transport of goods and people in dense cities.
CLOSER is a Swedish platform for collaboration, knowledge and innovation for increased transport efficiency. The results of our work are new solutions for the freight transport system needed to build a sustainable society.

CLOSER is hosted by Lindholmen Science Park.

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