Smart Mobility
Establishment of a new urban trolley bus network in the City of Klagenfurt on Lake Wörthersee
Interrelations with the future bus fleet structure and the role of public transport at local and regional level

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Agenda

- Klagenfurt city and transport – short introduction
- Transport policy goals
- Approach:
  Development of public transfer network and trolley / electric bus solutions
- Challenges of transition
- How can transition succeed

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City of Klagenfurt/WS
Klagenfurt/WS - Statistics

- 100,000 inhabitants
- 160,000 daytime population
- 120 km²
- Capital of Province of Carinthia
- Trade and school center of the region
Public Transport Network
Transport Key Figures

• Bus network
  • 20 lines
  • 414 km
  • 387 stops
• 66 vehicles
• 2.8 m timetable kms
• 20 m passengers

Current Modal Split Klagenfurt 2014

- Public transport: 48%
- Pedestrian: 24%
- Bicycle: 12%
- Car driver: 10%
- Car passenger: 6%

Source network and ridership data 2016: Mobility-Masterplan

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We are in Transition in 2006

Retrofiting of Buses, P & R, Traffic Ban, Euro 5/6
PM10  Number of days with limit value exceeded 2003 – 2017

Development of Air Quality

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Climate Protection Targets

**Climate Protection Targets Klagenfurt**
- -40% CO2 by 2030
- -90% CO2 by 2050

**Existing Plans & Strategies**
- Urban Development Plan 2020+
- **Covenant of Mayors** (SEAP, SECAP)
- Mission statement Klagenfurt
- e5 – European Energy Award Programme
- Smart City Strategy Klagenfurt
- Mobility Plan 2035

**Greenhouse gas emissions Austria***: Actual development 1990 - 2015 and goals until 2050

- Paris (1): Transport -40 to 42% compared to 1990
- Paris (2): Transport -95 to 100% compared to 1990
- Paris (3): overall -80% compared to 1990

* Sources: Umweltbundesamt, Bundesländer Luftschadstoff- Inventur 1990-2015, Regionalisation of National Emission data based on EU reporting obligations (Data from 2017)

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Demonstration Project Klagenfurt 2010 – 2015: CO₂-neutral, Electric Mobility

Co-funded by the European Union via the LIFE + Funding Programme. This project is financially supported in the context of the klimaaktiv mobil funding programme of the Climate and Energy Fund as a contribution towards protecting the environment and the climate in transport.
Modal Split Goal 2035

Current Modal Split (2014)
- Public transport: 10%
- Pedestrian: 48%
- Bicycle: 24%
- Car driver: 6%
- Car passenger: 12%

Goal 2035
- Ecomobility: 30%
- Motorized individual transport: 70%

Source network and ridership data 2016: Master plan

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Tripling of Passengers needed

Development of Passengers

Tripling by 2025

60 Millions Passengers


17500000 18000000 18500000 19000000 19500000 20000000 20500000 21000000 21500000 22000000

60. Mill.
New Mobility Plan

Motorized individual transport

Urban development

pedestrian and bicycle traffic

Public transport

Mobility platform MAAS
Public Transport

Infrastructur & vehicles

- Attractive appearance (e.g. roofing of bus stops)
- Optimal positioning of the stops and intelligent transport organisation (leading of green-phase for the bus, safe stops, bus corridor etc.)
- Expansion of P&R facilities (as close as possible to the source location, especially at quick-train station in the region)
- Decarbonisation of the vehicle fleet (alternative powertrains, trolley bus, Hybrid-System)

Transport organisation

- BUSCONCEPT NEW
  - Secure of Connections (Waiting for connections)
  - Attractive ticket system (favorable time cards, MAAS)

Awareness

- Public Awareness and Customer loyalty (Marketing-/Campaigning)
- School Mobility Management
- Business Mobility Management
New Public Transport Network

Fundamental supply standard change: high frequency PT (basic 10' headway peak) → hop on without bothering about timetables!

Multimodal Hubs: rendez-vous-interchanges, bike- & car-sharing

Multimodal Mobility Points
Quo vadis Public Transport

Regional Rail System as a backbone
Attractive bus-line-concept (10 Min)
Multimodale Mobility Points
Digital Mobility Platform (MAAS)
Emission Free Buses from 2025 (Trolley-Hybrid-Buses?)

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Decarbonisation
Considerations on sustainable technology

**E-Buses**
DL Depot Charging
costly; reliability?

**E-Buses**
GL additional charging
on the network
costly; reliability?

**E-Buses**
IMC in motion charging
reliable technology
efficient for high frequency routes

**Zero Emission**
Electricity from RE
already today!

Picture E-Bus IMC: Courtesy of Linz AG, other pictures: KCW (Berlin)

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Comparison of Additional Costs

Costs depending on E-bus types, network characteristics and cost prognosis scenarios (as of 2035)

- IMC = likely the most efficient solution for Klagenfurt
- Will JASPERS be ready to support IMC introduction?

Bars represent percentage of additional full costs including vehicles and infrastructure, for 12 m buses, compared to conventional Diesel buses

- IMC: dynamic charging under overhead wires
- GL: snap charging
- DL: depot charging

Source: KCW (Berlin), calculations based on own market intelligence and literature data; June 2018

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Estimated Additional Costs

Scenario local Public Transfer in Klagenfurt:

- Transformation Costs
- Infrastructure costs for IMC
- Replacement of vehicles
- Expansion of supply and capacity
- Significant increase in market share of PT

- Powertrain de-carbonisation
- Service/capacity expansion
Additional Funding is Key.

• Challenges: decarbonisation and modal shift

• Leading to higher cost for the city of Klagenfurt

→ who will fund it?

• Political support depends on additional funding sources!
Back to the Roots?

PT in Klagenfurt was already emission free until 1963

But today with efficient and sustainable technology fundable!
How can transition succeed

We can learn a lot from nature!

Let’s go together over the bridge of change
Contact

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More Information

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