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# 200 Climate Adapted transport facilities with more to come

## Green Roofs on Vienna's Bus Stops: A Step Towards Climate Resilient Transport Facilities

***To combat heat stress for passengers, Vienna tested various green roof solutions for bus stops, evaluating different plant types and shading techniques. Sedum mat roofs, known for their easy installation and low maintenance, emerged as the most effective solution, reducing ambient temperatures, and complementing the city's Green Infrastructure network.***

***Key Learnings***

- **Thoughtful planning ensures the best outcome**: The main challenge was achieving the right cost-benefit ratio. Given Vienna's extensive bus network, careful planning was required to identify the locations where green bus stops would have the greatest impact.
- **Various possibilities**: There are various ways to implement green bus stops. Each solution has unique advantages and disadvantages depending on its location. It is essential to find the most appropriate solution for each site.
- **Small actions can have a major benefit**: Even small actions, like greening a single bus stop, can positively affect perceived temperatures and enhance the overall well-being of the people waiting for public transport.

## About the region

Vienna, the capital of Austria, has a population of approximately 2 million and spans an area of about 415 km² across 23 districts. Each year, 792 million passengers use Vienna's public transport system, highlighting the sector's significant potential for climate change adaptation. The city is increasingly facing extreme weather events, including heatwaves and flooding.

### Climate Hazards

Extreme Temperatures, Storms, Droughts,

Flooding

### Sector

Transport, Water Management, Biodiversity

### Key system

Health and Wellbeing,

Water Management, Ecosystems and Nature Based Solutions


## Climate Threats

Vienna is located in an area with continental influences, meaning mild winters, less precipitation and longer dry periods compared to other parts of Austria. Dry and hot summers, followed by heavy rain require adaptation actions. Heat especially impacts children and the elderly. The summer of 2024 was the hottest ever recorded in Austria. Compared to the global mean temperature rise of 1.8°C during the 20$^{th}$ century, the annual temperature in Vienna has risen by approximately 2°C only in the last 40 years. This trend especially affects urban areas as they often lack green spaces and concrete dominates the cityscape, resulting in hotter temperatures within the city compared to its surroundings. This urgently requires shade and cooling features (like vegetation). Therefore, Vienna tested various green roof types and other greening solutions to reduce heat stress and temperatures while passengers wait at bus stops.

## Adapting Transport Facilities with Nature-based Solutions

The city explored various greening models differing in plant types, density, and shading techniques, with combinations tested at several locations across Vienna. These green "islands" improve the microclimate at the bus stops and their surrounding areas, helping to reduce heat stress. By creating a network of climate-adapted bus stops, Vienna aims to strengthen its broader green infrastructure, supporting urban biodiversity and cooling the city. With many residents relying on public transportation daily, prioritising the needs of vulnerable groups is crucial. Measurements show that green bus stops are about 1-1.5°C cooler than conventional ones, significantly improving thermal comfort for waiting passengers during heatwaves. Where technically feasible, new bus stops include roofs with sedum mats, which not only reduce heat but also support local biodiversity. The collaboration between Wiener Linien, Vienna's public transport company, and GEWISTA (an outdoor advertising company managing public station ads) was instrumental in successfully implementing this initiative.

*"We are proud to transform street furniture into small urban oases by incorporating greenery, such as on the roof of bus shelters. These initiatives positively contribute to the urban climate. We have invested considerable efforts to understand the most effective and sustainable technical and practical implementation ways. By integrating nature into city environments, we aim to create more sustainable and visually appealing spaces for everyone to enjoy. Our innovation commitment ensures that we are continuously exploring new methods and technologies to maximise the environmental and aesthetic impact of our projects, reinforcing our role as leaders in urban transformation.",*

*GEWISTA*

*Figure 2: Construction site of a climate-adapted bus stop at Parliament. Image Credit: Wiener Linien.*

*Figure 1: A completed climate-adapted bus stop with a green, vibrant roof, also supporting biodiversity. Image Credit: Wiener Linien.*

*Figure 4: Completed climate-adapted bus stop at Parliament. Image Credit: Wiener Linien.*


*Figure 3: A more practical type of climate-adapted bus stop with sedum mats. Image Credit: Wiener Linien.*

## Summary

In response to increasing heat stress and climatic challenges, Wiener Linien, in collaboration with GEWISTA, implemented green roofs on bus stops to create climate-adapted public transport facilities. Through careful planning and testing, the project team evaluated various models, each tailored to site-specific requirements, balancing their unique advantages and disadvantages. Sedum mats emerged as the most cost-effective solution, offering easy maintenance and significant benefits. These efforts highlight the potential of small-scale interventions to contribute to greener, more liveable cities, reinforcing optimism for a sustainable future.

## Further information

- https://presse.wien.gv.at/presse/2024/09/18/wiener-gewaesser-daten-zeigen-1000-jaehrliches-hochwasser-am-wienfluss (in German)
- Begrünte Wartehäuschen werden mehr - wien.ORF.at (in German)

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