Improving mobility options with DRT-to-PT links in low-demand or low-density areas

UPPER CLUB

November 2025 · Webinar Summary

Contents

Introduction

What can demand-responsive transport (DRT) do for access and inclusion?

On 12 November 2025, UITP's Shared Mobility Unit, through the On-Demand Mobility Committee and under the UPPER Club initiative, hosted the webinar "Improving mobility options with DRT-to-PT links in low-demand or low-density areas". Moderated by Bruno Mesquita (UITP), the session explored how three cities are implementing DRT measures supported by the UPPER project — and what on-demand services can offer where conventional public transport is limited, infrequent, or difficult to operate efficiently.

UPPER is coordinated by UITP and brings together 41 partners. The project aims to increase both ridership and satisfaction with public transport in ten cities and regions across Europe. To achieve this, 10 UPPER cities and regions are implementing around 80 measures that prioritise public transport and sustainable mobility.

The UPPER Club is a peer-exchange initiative designed to connect cities and selected UITP members through structured discussions. It enables UPPER cities to share progress and challenges during the 2025–2026 implementation phase, while inviting peer questions, practical insights, and potential pathways for replication beyond the project.

The webinar featured:

Mannheim (Germany): "Improve mobility in peri-urban areas for different user groups with fips" presented by Tobias Simon and Philipp Shahinfar, Traffic Planners, rnv GmbH Mannheim

Thessaloniki (Greece): "Increase the accessibility to public transport in low-demand areas of the city with UpperFlex" presented by Vassilis Mizaras, Senior Project Manager, CERTH

Hannover (Germany): "Sustainable transport chains with Sprinti" presented by Calla Wilhelm, Traffic Planner, Region Hannover

Mannheim

Improve mobility in peri-urban areas for different user groups

Mannheim's case illustrates how DRT can be deployed as a complementary layer within an already strong public transport system. The public transport operator rnv runs services not only in Mannheim, but also in neighbouring Ludwigshafen and Heidelberg, serving around 800,000 residents in total. Trams, tram-trains and buses provide a strong radial network into the city centre. Off the main corridors, however, connections were often weak, slow, or sometimes requiring multiple transfers. To address these gaps, rnv launched **fips**, an in-house on-demand service operated by rnv using 100% electric vans (five passenger seats).

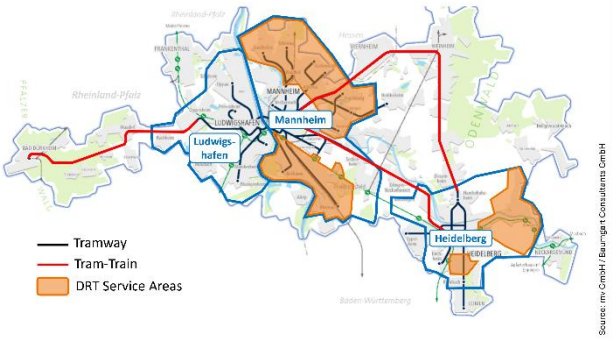

Figure 1 – Map of complete rnv service area

During the pilot phase, from 2021 to 2024, fips was offered "on-top" of existing network as no bus or tram routes were removed, and priced as the standard public transport fare plus a €1–2 surcharge per trip. The aim was to improve access in peri-urban and industrial areas, with a particular focus on older passengers and people with mobility impairments.

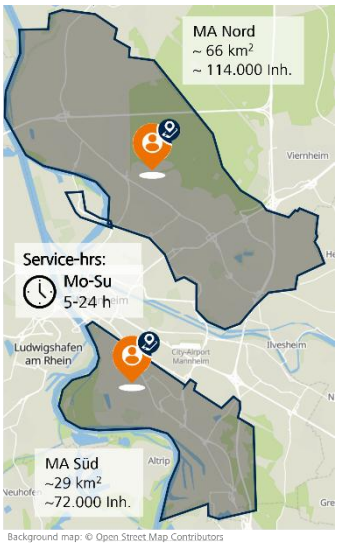

Figure 2 - Different service areas of fips

The service serves two areas:

- **North Mannheim**: focused on providing direct tangential connections in a complex urban and industrial area where bus journeys would have required several connections. Proved highly successful, with strong demand and ridership growth.
- **South Mannheim**: focused on first/last mile feeder for areas with long walks to bus and tram stops. It generated some uptake, but much less than expected, so after the pilot, the southern service area was reduced.

A weekend night service performed particularly well and attracted a younger user group, reinforcing the value of DRT for times and places where fixed routes are less attractive or feel less safe.

Figure 3 - fips shuttle © rnv GmbH / AdlerMedien

The impact on accessibility and the new operational barriers

One of fips' most notable impacts was on accessibility. Since the electric vans can use small, narrow and steep streets, and trips involve short walks to virtual stops and direct rides, fips achieved a **high share of passengers with impairments**, around 15%, almost four times the share on fixed bus and tram lines. Passengers with mobility impairments are also entitled to free travel, highlighting DRT's potential as a tool **fostering inclusion**. At the time of the webinar, the Mannheim fleet totalled 18 vehicles, including three wheelchair-accessible vehicles.

At the same time, the design choices that enable inclusion for some passengers can create new constraints for others. DRT vehicles are closer to passenger cars than buses, and small fleets combined with small vehicles make operations more fragile. Only some vehicles are wheelchair-accessible; a single wheelchair typically takes the space of two seats. Families with several small children cannot always be accommodated because of limits on child seats, and strollers, service dogs and luggage add further obstacles that are difficult to combine in one small vehicle. Peak demand brings additional pressure, as the number of seats is fixed and requests cannot always be served when demand rises.

There is also a **digital access barrier**. fips relies on a smartphone app for booking. People without smartphones must register in writing first and can then call a call centre. This is more complicated than simply walking to a bus stop and is costly to operate.

This raises the question for rnv and the city:

> ***"How far are we willing to risk alienating loyal existing users in order to attract new ones and increase ridership?"*** Philipp Shahinfar, rnv

What's next for fips?

After the pilot phase ended in 2024, funding sustainability became a central issue. National and regional funding had covered up to 25% of operating costs, but this support ended in 2024, just as municipal finances became tighter. As with most public transport, ticket revenue does not cover full operating costs; the remaining deficit is ultimately covered through the city-backed budget. rnv therefore had to decide how to maintain and integrate a service with relatively high costs per passenger compared with fixed lines, as abandoning a system that had clearly improved access for many passengers was not an option. The response has been to **rethink and redesign the bus and DRT network**.

fips demand patterns helped identify a corridor with strong, consistent demand, supporting the introduction of a new tangential bus line and a broader redesign of the bus network. Existing lines have been disentangled and simplified, reducing complexity and making the network easier to understand; in the affected area, only four bus lines will remain, down from seven. In parallel, the fips zone will be shrunk and refocused to fill remaining gaps and serve very low-demand time periods, operating from 05:00 to midnight. Shorter maximum trip lengths should increase passengers per vehicle-hour, improving efficiency. In two areas where evening ridership on fixed routes is very low, fips will replace buses after 20:00 or 22:00, because on-demand service is assessed as more cost-efficient than running near-empty buses. After these cut-off times, the service is consolidated into one larger evening operating area to maximise flexibility. As the DRT service becomes part of the regular network, filling gaps rather than duplicating existing lines, the surcharge will be dropped.

Q&A Highlight

What is rnv's long-term vision for Fips? Keep it at today's scale, expand it, or gradually replace it with new fixed routes as demand grows?

The presenters described a familiar "paradox of success" in DRT. When you introduce an on-demand service, it often attracts trips that the network wasn't serving well before - so demand rises. But as demand grows, the service needs more vehicles and staff, and operating costs increase. At a certain point, those trip patterns may be dense and consistent enough that a fixed route becomes the more efficient solution. In that sense, a successful DRT service can help design itself out of some corridors, yet it remains a success because it delivers mobility in the meantime and generates the demand evidence needed to reassess the network and decide where fixed lines should return and where on-demand coverage is still the best fit.

Thessaloniki

Increase the accessibility to public transport in low-demand areas of the city

While Mannheim is already moving into a network redesign, Thessaloniki is in the piloting phase of its DRT system. In Greece, DRT has so far been tested in small-scale pilots, never as a large deployment. Thessaloniki, the country's second largest city and one of the EU's 100 Mission Climate-Neutral Cities, is now positioning DRT as part of a wider transformation aimed at meeting its climate goals by 2030, alongside a newly launched metro, suburban rail, buses and micromobility.

A challenge familiar to metropolitan areas, Thessaloniki has peripheral municipalities with poor public transport coverage and a heavy car dependency.

Thessaloniki's DRT solution called **UpperFlex**, focuses on the municipality of Pylaia-Chortiatis, especially the Panorama community - a low-density, hilly residential area with its own village centre and commercial hub - where **almost 90% of trips are made by private car or taxi**.

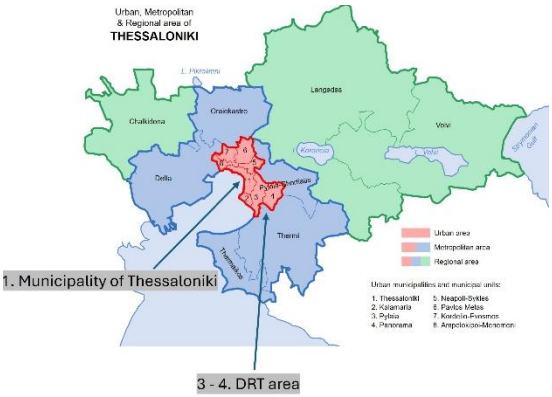

Figure 4 - Urban, Metropolitan and Regional area of Thessaloniki © Wikipedia

The newly-opened Thessaloniki metro does not reach the area, and fixed bus services, are infrequent and inadequate, particularly at weekends when headways can stretch to one to two hours. This gap has fuelled friction between citizens, the municipality and public transport operators over whether public transport is truly meeting everyday needs.

Figure 5 – Taxi based DRT service

Faced with limited public transport coverage and high expectations around comfort and reliability, the city opted for a pragmatic solution that could be deployed quickly and at scale. **UpperFlex** takes an unusual approach in the European DRT landscape. Rather than starting a new dedicated fleet, Thessaloniki is using what it has: a large taxi fleet (over 1,000 vehicles).

UpperFlex: a taxi-based DRT service

The taxi fleet offers immediate scale without the upfront cost of purchasing and equipping vehicles. It is also a pragmatic fit for Panorama's context, as expectations around comfort are high and the number of pilot users is relatively limited. A taxi-based DRT model is therefore designed not only to fill a coverage gap, but also to meet this user group's demands, testing whether shared, booked rides can become a credible alternative providing daily trips and metro access.

"We want somehow to be able to talk the same language and understand the same things." Vassilis Mizaras, CERTH

UpperFlex is a door-to-door service running 18 hours a day, seven days a week. Trips are booked through a dedicated mobile app, while the taxi company is supported by web-based dispatch tools. As mentioned during the presentation, the service builds on taxis, as it fits around the operator's existing systems, reducing friction for dispatchers and drivers.

Fares are zone-based and heavily subsidised: rides are free during the current soft opening stage, and in the main pilot users are expected to pay around half of the trip cost. From the outset, safety and security shaped the design. User surveys put live trip monitoring and clear records of who travels where and when at the top of the priority list. Those requirements are especially important in a service that aims to attract groups who may otherwise default to private cars or taxis for reassurance, particularly at night or for vulnerable travellers.

The pilot is organised around next-day planning. Users are asked to book by 21:00 the night before travel, which then the system clusters requests into shared rides, aiming for up to three passengers per taxi. By early morning, the taxi company knows how many trips must be served and can schedule drivers accordingly. Cancellations are allowed up to 15 minutes before departure; after that point the trip is charged. As pointed out, this strict cut-off is deliberate as it maximises the chances of pooling at low volumes and gives the taxi company early certainty to schedule drivers for the morning start.

To allow a real-time spontaneous trip element, the user app also features a "feel lucky" option: if a user wants to travel in the next 15 minutes, they can ask to "hop onto" an existing clustered trip - but only if a spare seat happens to be available.

Thessaloniki expects that uptake will be slow at first and then accelerate sharply, based on experience from the last six months, with an expected target of 200 users. In the soft opening stage, which took place from autumn 2025, with around 25 users, it was genuinely celebrated when two strangers shared a taxi for the first time. It sounds small, yet it marks an important psychological milestone: **people beginning to accept and trust the idea of shared, pre-booked rides** - an essential step if DRT is ever to shift behaviour in a car-oriented suburb.

From pilot to scaling-up

The service is designed around the needs of inhabitants. First, it **connects dispersed residential areas with the village centre and local amenities**, including hospitals, municipal services, schools and sports facilities such as the Olympic Athletic Centre. Alongside adults and older residents, a key target group is unaccompanied children aged 13 and above travelling to school or sports, where safety, traceability and parental confidence matter as much as travel time.

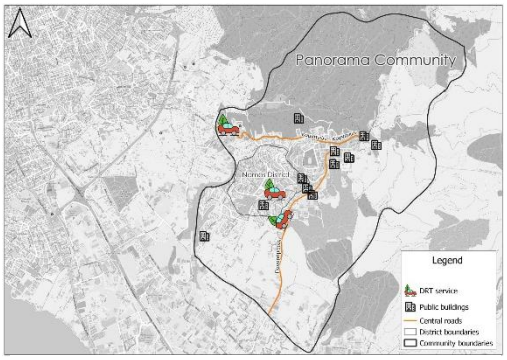

Figure 6 - Use case 1: Connection of residential districts in Panorama

Second, UpperFlex acts as a **feeder to the Nea Elvetia metro terminus**, a major multimodal hub with park-and-ride facilities. Because many residents cannot reach the station easily by fixed routes, the service aims allow people to share a taxi to the metro station and continue their trip by rail, creating a multimodal chain.

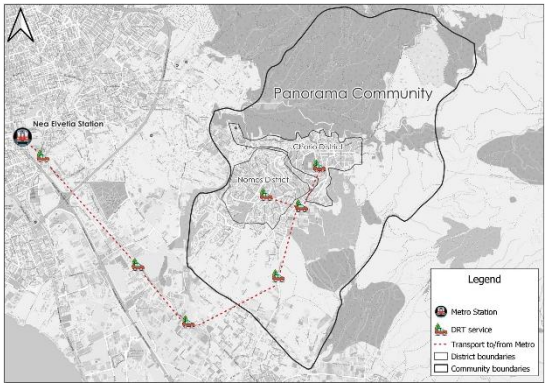

Figure 7 - Use Case 2: Connection with Nea Elvetia metro station

Q&A Highlight

If DRT is often seen as expensive, why is Thessaloniki aiming for 5–10% of bus-based trips to shift to DRT in low-density areas, and who funds that?

The presenter explained that UpperFlex is not only a mobility pilot, but also a governance, feasibility and financial test. In Thessaloniki, bus-based public transport is delivered by different entities, including private operators in the lower-density parts of the agglomeration. In those areas, maintaining an acceptable fixed-route service can be expensive and politically sensitive, particularly when ridership is low. Against that backdrop, the Public Transport Authority has indicated that 5-10% of bus-based public transport in low-density zones could eventually be delivered by DRT. The intention is not to replace fixed routes in the dense urban core, but to use DRT surgically in the “green” low-density areas, where it may provide better access at lower cost than financing infrequent fixed routes. In that sense, UpperFlex is less about proving that DRT “works” technically, and more about testing whether it can be organised, funded and coordinated in a way that allows it to scale.

Hannover

Sustainable transport chains

If Thessaloniki demonstrates how DRT can be introduced as a pilot in a car-dependent urban context, the Hannover Region shows what happens when on-demand services are scaled into a core component of a regional transport system.

The Hannover Region is both a geographic area and a local authority. It brings together 21 towns and municipalities, serving about 1.2 million residents. Unlike many metropolitan areas where responsibilities are split, the Region plans, organises and finances all local public transport.

Sprinti was developed as part of the Region's Sustainable Urban Mobility Plan (SUMP), which aims to double public transport performance and deliver flexible, connected mobility in urban and rural areas.

Operating in 12 municipalities in the outer ring around the city of Hannover, a mix of suburban and rural areas, Sprinti targets diffuse internal trips within municipalities – journeys that fixed bus lines struggle to serve efficiently, and strengthens access to the wider network, including suburban rail.

A key political and operational decision was to integrate Sprinti fully into the existing tariff system. Any public transport ticket valid on buses, suburban rail and light rail is also valid on Sprinti, with no comfort surcharge. The intention is to keep the system simple, legible and socially fair, and as noted by the speakers, this surcharge would bring limited additional revenue anyway.

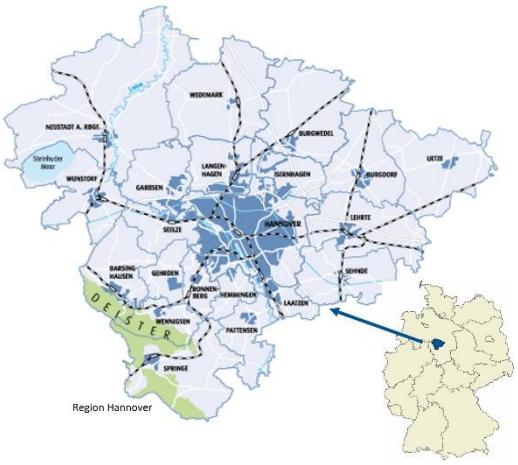

Figure 8 - Region Hannover

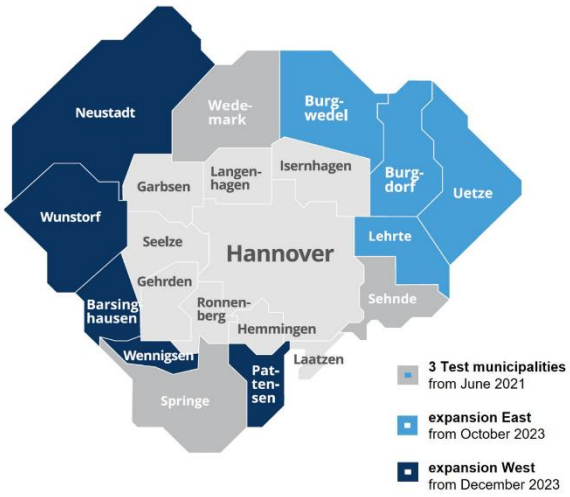

Figure 9 – Sprinti services expansion

Figure 4 - Sprinti vehicle

Sprinti: how does it work?

Booking is possible via app or by phone, which is critical for reaching users beyond the purely digital audience. Pick-up takes place at existing stops or at virtual stops typically within 150 to 200 metres of the user's location, and the usual waiting time falls between 15 and 20 minutes. Importantly, Sprinti is designed around smart pooling and intermodal travel. The app can book an entire trip chain, for example, Sprinti to a station and then a suburban train, with guaranteed . At the same time, Sprinti is not allowed to compete with the fixed network: if a good scheduled public transport option exists for a requested trip, Sprinti cannot be booked. Accessibility and special items are supported, but they must be requested in advance, so vehicles and capacity can be managed reliably.

Since the testing phase in 2021, Sprinti has scaled into a high-volume service. It now records roughly 126,000 to 127,000 journeys per month, exceeds 6,000 journeys on peak days, and passed the three-million-journey mark in June 2025. Demand continues to grow, with the typical seasonal pattern seen in many shared services: spring and autumn tend to be the busiest periods. This growth reflects that the DRT service is creating new mobility options in areas where the alternative is often "drive or don't go."

Beyond operational scale, the impacts of Sprinti are increasingly visible at the social level. Research undertaken with the German Institute of Urban Affairs links the region's mobility challenges to a broader story of centralisation. As many municipalities have lost social and commercial infrastructure over time, residents have had to travel farther for everyday needs, while traditional bus networks have struggled to match these dispersed, cross-municipality travel patterns, contributing to mobility poverty.

In that context, Sprinti has become strongly associated with social participation. The ability to book journeys based on real demand creates practical access for people who otherwise have limited options, and usage is high among residents with mobility impairments, people on low incomes, those without a car or driving licence, and younger and older travellers.

"Without Sprinti, most of the trips would not have been possible."
Calla Wilhelm, Region Hannover

What's next for Sprinti?

Sprinti began as a federally funded model project to strengthen public transport. Between 2021 and 2024, around €17 million in federal funding supported launch and expansion. Annual operating costs are now around €25 million, covered entirely by the Hannover Region's public budget until 2027; beyond that, funding is uncertain. That uncertainty matters because Sprinti is no longer a marginal experiment. In a small number of cases, Hannover has already cut underused bus lines and fully replaced them with Sprinti - routes with very low ridership where the cost of running a bus could not be justified.

At the same time, rising demand has required fleet expansion, and the fleet now stands at around 120 vehicles, expected to rise to 130 by January 2026.

Interestingly, Hanover Region's experience suggests that improved efficiency has come less from sheer fleet size than from careful tuning of service design parameters, including acceptable detour lengths, waiting-time thresholds and pooling preferences. As mentioned during the discussion, these adjustments have been the main driver of efficiency gains; fleet growth was still necessary once the system hit a practical capacity ceiling and could no longer carry additional demand with the same vehicles.

The deeper promise of DRT has always been not just flexibility of demand, but flexibility of supply; the open question is **how far systems like Sprinti can reduce costs through smarter operations without cutting into the flexibility that makes them attractive in the first place**.

In Hannover's rural municipalities, suddenly withdrawing Sprinti would mean a dramatic loss of mobility for many vulnerable residents. Keeping it running is therefore not only a transport decision, but a social policy one.

Sprinti's next phase is being shaped by both climate and operational strategy. All new vehicles from 2026 will be electric, and by then around 60 of the projected 130 vehicles are expected to be electric.

Q&A Highlight

Could automation reduce Sprinti's operating costs and help keep the service viable in the long term?

Calla and Sebastian explained that Sprinti's continuation is currently, above all, a question of political will - a deliberate choice to fund the service because it enables social participation. Automation was seen as a potential long-term lever: it could help improve the cost equation in the future and represents an important milestone for Sprinti's development. However, both the public transport authority and operator cautioned that it is not a low-hanging fruit. Current providers are expected to charge a premium for early deployments, meaning the transition would likely be more cost-intensive in the short term, with any cost reductions only possible further down the line.

Key conclusions

Demand Responsive Transport (DRT) is emerging as a strategic complement to conventional public transport in low-demand and peri-urban areas, delivering tangible benefits in accessibility, equity, and multimodal connectivity. The three cases discussed - Mannheim, Thessaloniki, and Hannover - demonstrate that DRT can bridge service gaps, support vulnerable groups, and reduce reliance on private cars. However, its long-term viability depends on three interlinked pillars:

Funding Innovation

Sustainable financing remains the most critical challenge. While initial subsidies and pilot grants enable experimentation, future models must diversify funding sources, including social inclusion budgets and other instruments (if available) such as the Social Climate Fund.

Operational Optimisation

Efficiency gains through service design (e.g., pooling algorithms, hybrid fixed/DRT lines) and electrification are essential. Yet, as highlighted in Mannheim and Hannover, scaling up does not automatically reduce costs; careful network integration and data-driven adjustments are key.

Policy integration

DRT must be embedded in broader mobility strategies, linked to MaaS platforms, and aligned with equity objectives. Governance complexity, as seen in Thessaloniki, underscores the need for clear institutional roles and coordination mechanisms.

The path forward lies in:

1. **Leveraging DRT as part of integrated public transport networks rather than as standalone pilots.**
2. **Using operational data to refine service design and identify opportunities for hybrid models.**
3. **Advocating for funding frameworks that recognise DRT's role in combating transport poverty and achieving climate-neutral mobility.**

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