
# The new eCitaro.

Ready for the city of tomorrow.

Mercedes-Benz

The standard for buses.


# Modern cities need modern solutions.

As a growing population leads to increasing mobility, the impact of urbanisation is felt most within cities. This results in both opportunities and risks for traffic systems, which are already operating at full capacity. One solution is a well-developed public transport system with local emission-free buses. The new all-electric Mercedes-Benz eCitaro paves the way for e-mobility in the city. It runs entirely with emission-free drive and is virtually noiseless. The eCitaro is also simply not an off-the-shelf vehicle but customisable to the specific wishes and requirements of public transport services.


# Every generation has its own leader.

The eCitaro is an all-electric bus which could only have been developed by Mercedes-Benz. It expands the portfolio of the worldwide bestselling Citaro with an all-electric, production-ready city bus that takes e-mobility to an entirely new level. The eCitaro, as part of the Mercedes-Benz Buses eMobility solution, is ideally equipped for tomorrow's cities today.

# The future needs a partner who knows their way around.

Electromobility is a challenge – both for private car buyers thinking about going to work or on a weekend getaway, and for transport companies that work with a fixed and finely graduated network of routes, timetables, cycles and scheduling. Their vision is of a 1:1 exchange of city buses with internal combustion engines for all-electric buses. This is, however, usually not possible without changes, and for this very reason, thorough preparation is indispensable – electromobility implies a full rethinking of urban mobility with buses and coaches. In addition to the higher costs and potential subsidies for electrically powered buses, conversion to electromobility requires detailed attention to energy consumption and range issues, to passenger capacity, to charging strategies, including energy supply, and, ultimately, to services ranging from equipping the company's own workshop to multi-tiered employee training. Another key factor in electrified bus operation is the topic of operational assistance. Effective decisions can be made in daily operations by merging depot, infrastructure and bus data. To this end, the eCitaro has to be integrated into depot management, and data, such as the charge level, needs to be made available at interfaces.

Mercedes-Benz is therefore pursuing a systematic solution. The eCitaro is much more than a city bus. It is part of the complete eMobility system from Daimler Buses.

# A glimpse into the future.

Mercedes-Benz is achieving a smooth transition in the development of its city buses: the dynamic, expressive design of the eCitaro takes its stylistic cues from the Mercedes-Benz Future Bus and, with its modern design language, offers a look into the future of Mercedes-Benz buses. The eCitaro harmoniously combines the established classic look of a city bus with the futuristic design language of bus generations to come. This fascinating meeting point is further enriched by striking details: the Citaro Ü's elegantly curved windscreen, the slightly lowered roof at the front, the slats with design elements in the front panel and the all-round trim of the roof superstructures. As expected from a Mercedes-Benz bus, form blends elegantly with function through the integration of folding bumper corners and front panel allowing for ease-of-access servicing and visual inspection.

**Technical information:**
**All details can now be found online.**
www.mercedes-benz-bus.com/technical-data-en




# Mercedes on the outside means Mercedes on the inside.

The eCitaro is not a prototype, but a fully developed all-electric bus. Its superior quality is ensured by the strongly established Citaro. Add to this production at the Mannheim bus plant on the line of the conventionally powered Citaro. Essential components such as the drive axle or electrohydraulic steering have already proven their worth in gruelling city bus use.

Additionally, the all-electric Citaro underwent extensive testing right up to the series production. A new level of stringent testing has been applied to this groundbreaking model to ensure the same level of dependability as conventional city buses. Mercedes-Benz tested the eCitaro at temperatures below minus 15 degrees Celsius within the Arctic Circle and at over 30 degrees Celsius in the summer heat of Spain. Winter testing also included vehicle operation on slippery roads to check the driving dynamics, control systems and recuperation. The bus also completed extensive summer testing in demanding city traffic and on steep ascents and descents in the Sierra Nevada.

**Winter trials 2018 in Finland:**
http://www.youtube.com/MercedesBenzOmnibus

# The city is for everyone. And so is safety.

Mercedes-Benz has been a pioneer in safety and assistance systems for decades and pursues the vision of accident-free driving. This ambitious goal will become even more important in the future as the traffic dynamics in city bus transport become evermore complex – never before has this challenged the driver as much as it does today. All the more reason, especially in cities, to protect not only passengers and bus drivers but also the safety of vulnerable road users such as pedestrians and cyclists.

The eCitaro adds two modern assistance systems for city buses: Sideguard Assist and Preventive Brake Assist. Sideguard Assist alerts the driver to critical situations in a timely manner when turning. The second system is Preventive Brake Assist. It is the first active brake assistant for city buses and makes a significant contribution to pedestrian safety in urban traffic.

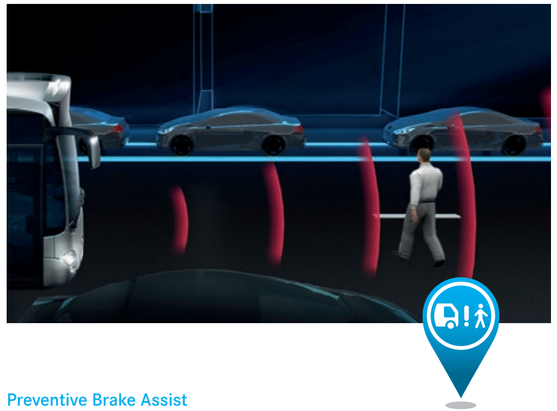
Numerous other assistance systems also support the driver – for example, the anti-lock braking system (ABS) and the Electronic Stability Program (ESP®), which Mercedes-Benz was the first manufacturer worldwide to use in buses. A roll-pitch control system with electronically controlled shock absorbers is also optionally available. This automatically stabilises the vehicle and therefore reduces body lean in bends.



## Sideguard Assist

The Sideguard Assist turning assistant feature considerably increases the safety of unprotected road users, especially in cities, since it helps the driver recognise critical situations in a timely manner when turning. The system operates in different stages: in a first stage, it informs the driver, and in a second stage, it provides an additional warning. If a moving object is located in the lateral monitoring zone, an LED light in a triangular shape illuminates yellow in the A pillar on the passenger side. It intuitively directs the attention to the situation next to the vehicle. Additionally, a warning message appears in the central display. If the driver initiates or continues an action that could lead to a collision, an additional visual warning is given: the LED light flashes several times red with higher luminosity and then permanently. In addition to this, a tactile vibration acts as a warning in the driver's seat. Moreover, Sideguard Assist warns the driver of stationary obstacles in the coach's turning curve and can also take on the task of a lane changing assistant, in which case it operates with the same warning cascade.

The images depict Citaro.



## Preventive Brake Assist

With the Preventive Brake Assist feature, Mercedes-Benz is offering the first Active Brake Assist for city line buses worldwide. The assistance system warns of a potential collision with moving pedestrians as well as stationary or moving objects and automatically initiates a braking manoeuvre with partial braking in the event of an acute collision hazard. Warning cascade and braking intervention are designed for use in city traffic. In the event of an imminent collision with pedestrians and with moving or stationary objects, the Preventive Brake Assist warns the driver visually by a red illuminated triangle with a vehicle symbol in the central display as well as acoustically, while initiating partial braking. This is held until either the driver intervenes or the bus comes to a stop. The platform for the Preventive Brake Assist is a new generation of radar technology: the radar system continuously scans an area of up to 250 metres in the lane in front of the bus and works reliably even at night and adverse weather conditions.

# Others call it a workspace. We call it a cockpit.

Even the most state-of-the-art city bus needs a driver to steer it. And, with this in mind, the eCitaro's cockpit differs only slightly from the familiar driver's workspace. The operating concept largely corresponds to that of the conventional Citaro. The transmission is operated in a familiar fashion with the D–N–R push buttons, but the instrumentation has been somewhat adapted. The tachometer is replaced by a power meter displaying current power demand. The battery's charge status is also visually clear. Via the central display, the driver can summon range, power availability and charging indicator information.





# We don’t think in terms of problems, but in terms of solutions.

All-electric city buses are heavier due to the batteries. Mercedes-Benz counteracts this with a well-thought-out weight distribution of the eCitaro’s components. For example, this applies to the variable position of the battery modules on the roof and the accommodation of the other battery modules in the rear. This is supplemented by the use of a front axle with with a permissible axle load of eight tonnes. The result is an efficient capacity of at least 88 passenger seats in the solo bus even with extensive equipment. The calculation is based on a curb weight of 13.5 tonnes and an approval with the now permissible total weight of 19.5 tonnes in the EU.

Additionally, the eCitaro integrates the Citaro’s proven interior plan so that the passenger compartment layout remains unaltered. This means the fleet and passengers do not have to adapt. What applies to the proven Citaro with combustion engine also applies to the eCitaro. Public transport services can choose from a variety of optional extras and make our bus their very own. Be it passenger seats, floor coverings, handrails, communication systems or even invisible details such as the door control – the Citaro with any drive system is and will always be an entirely customised city bus.



**We take safety seriously.**
**More safety for passengers and drivers: UN ECE Regulation 118.**

The new version of UN ECE Regulation 118.02 requires newly registered buses from summer 2020 to have additional fire test certificates for materials in the interior, engine compartment, and separate heater compartments. Having the greatest possible safety is a core value for Daimler Buses and compliance with the statutory requirements a self-evident duty. Therefore all materials now used in the interior of our buses are being tested, and where necessary respecified.

The modifications undertaken for plastics are not noticeable to the eye or touch. As part of qualification in accordance with UN ECE Regulation 118.02 the collection of our seat cover materials is also being changed. The only restriction will be in the variety of colour shades and patterns (designs) available. The quality requirements of Daimler Buses for the textiles of the seat materials in its collection will remain at the existing high level. We would ask you to be aware that the appearance and feel of the materials illustrated in this brochure may change due to these design optimisations in the interest of safety.

# New capacity for public transportation: the eCitaro G.

With the eCitaro G we present an all-electric articulated bus for busy routes. It is the logical extension of the Mercedes-Benz eMobility concept. With its modern, spacious interior, it can handle a practical number of passengers of up to 145. On an individual passenger basis, the eCitaro G impresses with its particularly good value in terms of purchasing and maintenance costs. This often makes it the most economical solution for routes with high passenger volumes. In comparison with the eCitaro rigid bus, it optimally covers the varying transport needs of future-oriented transport businesses. The eCitaro G scores with the classic values of the Citaro G and brings with it the outstanding technology and performance of the electrified rigid bus. At the same time, it benefits in terms of quality from numerous proven components. Its body is based on the Citaro G with combustion engine and its roof is based on the Citaro G NGT with integrated heavy-duty rails.



# True greatness comes from within.

In the eCitaro G a continuous low floor from the first to last row of seats ensures that passengers enjoy a high degree of comfort and guarantees a speedy passenger flow. The 18.13 metre long articulated bus is available with three or four doors. Both the door positions and the layout of the passenger compartment correspond to the Citaro G with combustion engine.

The eCitaro G can be maneuvered safely even in narrow streets. Its front and rear sections are connected by a low-floor articulation joint with a unique anti-jackknife control system (ATC). This ensures a high degree of stability and maneuverability. Even in reverse, manoeuvring is extremely easy. This is also ensured by the independent wheel suspension on the front axle. It makes the eCitaro G particularly manoeuvrable and additionally increases ride comfort.

The eCitaro G is designed as a standard push-pull articulated bus with a driven axle in the trailer. If the demands on power and traction are particularly high, for example due to a challenging landscape or demanding conditions in winter, it is optionally available with two driven axles. The ZF AVE 130 electric axle is then used not only as a rear axle but also as a centre axle. This ensures superior performance and traction even under difficult conditions. In addition, the second drive axle increases the recuperation capacity of the eCitaro G and reduces tyre wear.

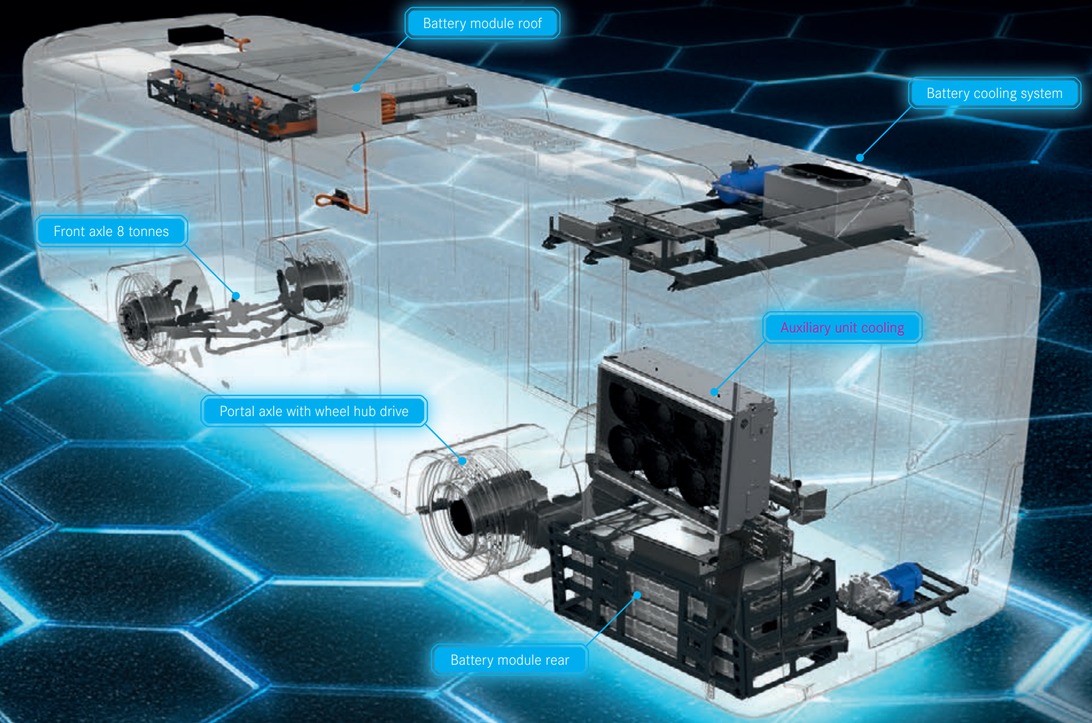
**eCitaro G · 3 doors**
Length: 18 m · Passenger capacity: 145 with standard battery equipment

**eCitaro G · 4 doors**
Length: 18 m · Passenger capacity: 145 with standard battery equipment

# Battery technology designed with the future in mind.

The eCitaro and the eCitaro G are never off-the-shelf buses. Transport businesses can use them to adapt their deployment, battery and charging strategies precisely to individual requirements. This is made possible by the modular technology of the eCitaro, which is geared towards a high degree of future-proofing. The current NMC batteries will soon be followed by the next NMC generation with even higher capacity and thus even greater range. This also allows an optional battery update of your eCitaro. At the same time, two charging technologies are available: depot charging and high-performance charging via pantograph.

Mercedes-Benz will be offering a further option in the form of the solid-state battery even before the second NMC generation. Our eMobility Consulting can advise you in detail on which battery variant is the most suitable for your requirements. No matter what you decide – with the eCitaro and the eCitaro G you are always close to the future.



# Full charge ahead: NMC batteries.

Whether your charging requirements are depot based or high-performance: the modern nickel-manganese-cobalt (NMC) cells used by Mercedes-Benz are equally suitable for both. Six, eight, ten or twelve battery clusters can currently be integrated, distributed over the roof and rear of the eCitaro. With maximum battery capacity and a total capacity of 292 kWh, the rigid bus achieves a range of around 170 kilometres. With fewer battery clusters, passenger capacity increases – if a longer range is desired, it can be achieved through intermediate charging via the pantograph if necessary. With the next generation of NMC batteries (Level 2), the range will increase again. An optional battery update of the eCitaro is also possible.

NMC battery – The advantages:
I Long, practical ranges.
I Modular capacity.
I High charging capacity.
I High-performance charging possible via pantograph.

# Far-reaching advantages: Solid-state batteries.

Another future-oriented battery technology is already in sight at Mercedes-Benz: solid-state batteries, or more precisely: lithium-metal-polymer solid-state batteries. They are characterised by a particularly long service life and a high energy density. Up to seven clusters can be installed, allowing for a maximum battery capacity of approximately 441 kWh. Thus, for example, the eCitaro G with a maximum load of solid-state batteries achieves a range of around 190 kilometres in summer. City buses with solid-state batteries cover other service profiles in which the technological benefits of the system are shown to their best advantage. Mercedes-Benz will therefore be offering the eCitaro and the eCitaro G from 2020 with both NMC batteries and solid-state batteries.

Solid-state battery – The advantages:
I High energy density for longer ranges.
I Long service life.
I Forward-looking technology.


# As flexible as its everyday life: the eCitaro's charging technology.

Just like its battery technology, the charging technology of the eCitaro also impresses with its future-proof flexibility. With this intelligent modular concept, transport companies can tailor their city bus in every respect precisely to the individual needs of the company or even the individual routes. Each eCitaro comes standard with a connector for Combo 2 type plugs – also known as CSS Type 2 – in the usual position of the tank filler neck. DC charging by plug usually takes place at the charging station in the depot. At the same time, the interior can be preconditioned to the desired temperature. The charging station and vehicle exchange extended data directly via the CSS connector, which complies with the new ISO 15118 standard. If high-power intermediate charges are required to extend the range, the eCitaro can also be charged en route in a few minutes using a pantograph.

A pantograph can be installed above the front axle on request; the option of charging rails will be added later. Intermediate charging may be necessary, for example, if the eCitaro has fewer battery clusters to increase passenger capacity. The eCitaro thus covers all common charging variants and adapts exactly to your requirements.

With our eConsulting we are happy to advise you on the best individual charging strategy. We are also your partner when it comes to setting up the appropriate charging infrastructure – from depot charging to the charging station with mast or portal.

# Temperature can not only be predicted, but also managed.

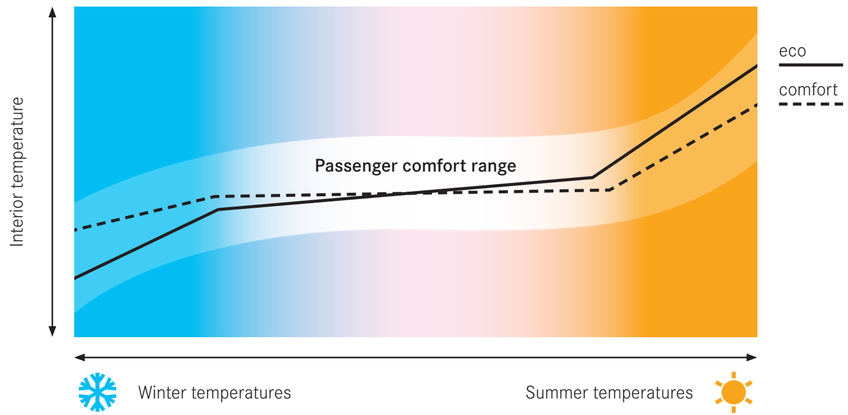
Due to the large interior, the huge window surfaces and the frequent opening of the doors, the interior temperature of a city bus is very energy-consuming. Since no usable waste heat is generated due to the high efficiency of an electric motor during operation, the total energy consumption of an all-electric bus can nearly double, especially during the heating season. This high additional energy consumption has a clear impact on range. This is why the eCitaro's sophisticated intelligent thermal management minimises energy consumption while ensuring maximum range.

The interior can be preconditioned to the desired temperature as early as during charging in the depot. The passenger compartment is cooled by a standard roof air conditioning system with an energy-saving heat pump.

The passenger compartment is heated by a heat pump as well as by the waste heat of an electric heating element. Additionally, the Citaro's usual electrically operated side wall heaters with blowers are available. The well-known front box features a double heat exchanger. Optionally, a fuel-driven auxiliary heater can be used. The automated interior temperature, which depends on the outside temperature, is especially innovative. Here you can choose between an Eco and Comfort characteristic line. This leads to an increase in efficiency of up to 40 per cent.

# Intelligent thermal management reduces energy consumption.

**Mapping of passenger compartment temperature**



# Highly efficient heating through networking.

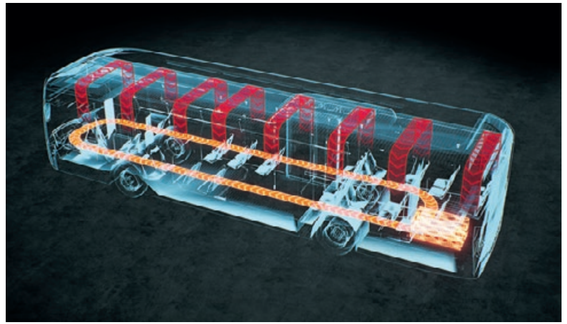
The design of the passenger compartment's air conditioning system is based on the specifications of the Association of German Public Transport (VDA). The level of comfort in the outer limits, where ambient temperatures are either extremely hot or extremely cold, is adjusted. Instead of a predetermined absolute interior temperature, a defined reduction or increase to the external value is used. Thermal management has been optimised down to the last detail.

This means that all heat-emitting components are networked together to optimise the energy required for cooling. The performance of heating and air conditioning also varies depending on the number of passengers on board. This is determined via the axle load sensors.

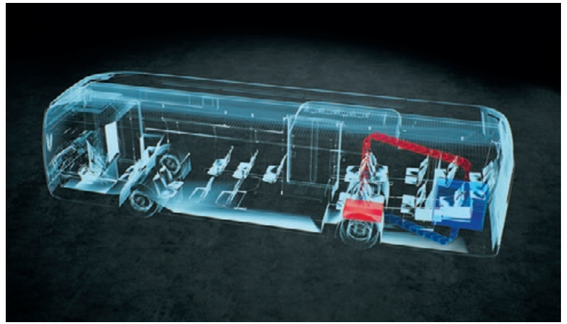
Since the city bus passengers usually spend only a short time in the vehicle, this slight comfort limitation in favour of energy consumption and therefore range is perfectly reasonable. On the other hand, since drivers spend their entire work day in the city bus, their requirements are somewhat higher – especially recognising that maximum driver fitness needs to be safeguarded. With this in mind, the air conditioning of the driver's work station is regulated separately and independently of the passenger compartment.

Overall, the energy required for the eCitaro's heating, ventilation and air conditioning is close to 40 per cent lower than for the current Citaro with an internal combustion engine.

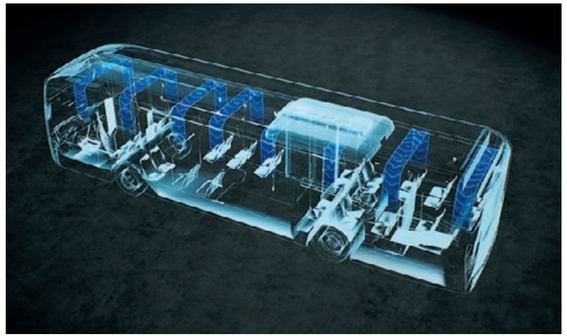




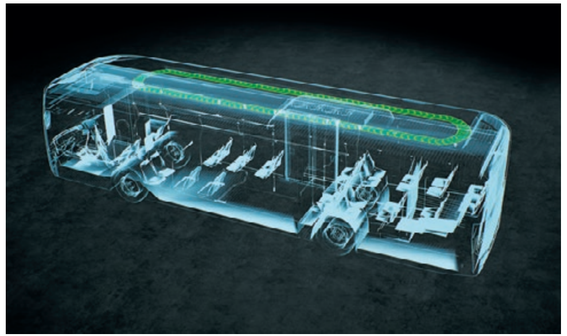
Efficient heating



Auxiliary unit cooling



Air conditioning



Battery temperature control

# A best-case solution even in the worst-case scenario.

The daily routine of a city bus is characterised by many unpredictable adversities. This is why Mercedes-Benz bases its range specification on a typical city bus deployment based on SORT2. With the currently achievable ranges of the eCitaro, subnetworks can be operated today without intermediate charging in the daily workload of a city bus.

## Minimum energy consumption at maximum range – in all seasons.

Energy consumption of rigid vehicle according to SORT2 urban driving cycle (in kWh/km).


Diesel – 3.5 kWh/km

eCitaro – 2.0 kWh/km

# Good advice doesn’t have to be expensive. Just included.

**eMobility Consulting from Daimler Buses** is a comprehensive consulting service in which experienced employees first present the efficiency of the eCitaro to the transport companies and then sound out the ideas, expectations and wishes of the companies. In a next step, each line is analysed individually and comprehensive data is compiled: from the line length to passenger volume to average speed. Even the outside temperature plays a role here. A specially developed simulation program maps the eCitaro’s system behaviour under real operating conditions, calculates the energy requirement and simulates various recharge scenarios.

Our experts evaluate the individual deployments and link them together. This results in different variants, from the standard setting with range calculation to the topic of charge management to the organisation of the depot. The advantage here is the experts’ comprehensive knowledge of their own buses, the direct communication line to the development engineers, and the professional and trusting relationship with the transport companies – which all results in very unique know-how for the bus transport system.

In addition to providing advice on how to best deploy the eCitaro fleet, the end result will include precise recommendations and calculations on charging infrastructure, energy consumption, grid connection power, and the development of cost-effective charging and load management.



# Our service begins when you purchase your bus.

Service, maintenance and repairs are changing with the advent of electromobility. This is why Mercedes-Benz has prepared a complete, tailor-made service concept for the OMNIplus service brand. We are committed to supporting you in the best possible way to master the transition to electromobility. You can rely on our proven selection of OMNIplus Service Contracts, which we have adapted to the requirements of electromobility. When purchas-ing an eCitaro, a five-year warranty for the high-voltage battery as well as the maintenance, repair or replacement of components in the high-voltage system are included as standard. You are given the opportunity to additionally expand the scope of services (maintenance and repair) at predictable costs. So that you can head into the future of electromobility fully covered and with absolute confidence – knowing that you have a reliable partner by your side.

## The OMNIplus eService Contracts:

**eBasic**
With the eBasic Service Contract, you can secure your new eCitaro even better at predictable costs.

**Scope of services[1]**
Repairs to the **high-voltage system[2] and the high-voltage battery, supplies other than battery charging** as well as all **maintenance work on the complete vehicle as required by the manufacturer's specifications are covered.** This applies to all parts fitted to the vehicle ex works in accordance with the design specifications (except for supplied parts).

**ePremium**
The ePremium Service Contract provides the all-round worry-free package for switching to an electric bus fleet.

**Scope of services[3]**
**Repairs to the entire vehicle including maintenance and wear** are covered.
**Also included are the eBasic services.**
Additional services included in the event of a breakdown:
+ Surcharges in the case of 24h *SERVICE* for work performed outside of normal working hours
+ All vehicle-related costs in the event of a breakdown, including: towing costs, spare parts procurement costs, travel costs and labour costs.

**Contract finalisation**
It is possible to finalise an agreement for both types of contract at any time. Duration and mileage can be determined individually. Additional packages such as for statutory inspections are also available.

[1] Excluded are: substantive damages, damage to equipment not permanently attached to the vehicle, care and cosmetic repairs, advertising space, daily testing as per the operating instructions and necessary materials resulting from company repairs to tyres, rim damage, glass breakage, upholstery, seat covers, floor coverings, surcharges and follow-up costs relating to 24h *SERVICE*, as well as towing costs. The exact scope of services is to be taken from the contractual documents.

[2] The high-voltage components on the eCitaro include parts of the powertrain (drive axles with wheel hub motors, converters and electric drive control), compressed air and air conditioning compressors, inverters. The exact scope of services is to be taken from the contractual documents.

[3] Excluded are: substantive damages, damage to equipment not permanently attached to the vehicle, care and cosmetic repairs, advertising space, daily testing as per the operating instructions and necessary materials resulting from company repairs to tyres, rim damage, glass breakage, upholstery, seat covers, floor coverings. The exact scope of services is to be taken from the contractual documents.

# Well secured into the future.

If public transport companies would like to undertake maintenance and repair to varying degrees in their own workshop, the consulting services for the entire eMobility system also include information on workshop equipment, the required graded employee training as well as a complete training concept.

In Dortmund, OMNIplus has set up a unique model workshop with a central training location for electromobility. This is where employees and service technicians from customer workshops are trained. The high-voltage certifications cover the entire spectrum, from cleaning staff training to high-voltage safety instructions and graded training for electricians to the training module for instructors. Additionally, customers visiting Dortmund can experience the requirements for setting up a bus workshop for electromobility. Mercedes-Benz draws on many years of experience with hybrid and fuel cell buses in the model workshop.

We have also given serious consideration to the future of your eCitaro – with OMNIplus services designed to meet the requirements of electromobility, perfectly integrated and tailored to the specific needs of public transport companies. This means you will be on the road with your fully electric buses – safely, reliably and predictably – for a long time.





**Important for you. Important for us. Technical data stored in the vehicle.**
Electronic vehicle components (e.g. Engine Control Unit) contain data storage for vehicle technical data, including but not limited to Diagnostic Trouble Codes in the event of a malfunction, vehicle speed, braking force, or operating conditions of the Restraint System and Driver Assistance Systems in case of an accident (no audio and no video data recording). This data is either stored as a volatile e.g. Diagnostic Trouble Codes, over a short period of time (a few seconds only) e.g. in case of an accident or in aggregated form e.g. for component load evaluation. The data can be read using interfaces connected to the vehicle. Trained technicians can process and utilise the data to diagnose and repair possible malfunctions. The manufacturer can use the data to analyse and improve vehicle functions. When requested by the customer, technical data can form the basis of additional optional services. In general, data from the vehicle is transferred to the manufacturer or a third party only where legally allowed, or based on a contractual customer consent in accordance with data protection laws. Further information regarding storage of vehicle technical data is provided in the vehicle owner's manual. Mercedes-Benz Buses and Coaches naturally handles customer data confidentially.

**About the information in this brochure.**
Information about the product is subject to change after this brochure went to press (04/19). The manufacturer reserves the right to make changes in the design or form, deviations in colour, and changes to the scope of supply during the delivery period, insofar as the changes or deviations are reasonable for the customer, having regard to the interests of the seller. The illustrations may also show accessories and special equipment optional extras that do not form part of the standard scope of supply. Colours may vary for typographical reasons.

This brochure may also contain models and support services that are not available in some countries. Statements about statutory, legal and tax regulations and their effects are only applicable in the Federal Republic of Germany at the time this brochure went to press. Therefore please contact your Mercedes-Benz sales representative for the latest binding version.
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