

CITY ON RAILS





Škoda Group is one of the leading European companies in the field of transport engineering with history stretching back for more than 165 years. The group focuses on producing and developing vehicles for rail and public transport. Its products mainly include suburban train units, low-floor trams, metro trains, trolleybuses, electric buses, hydro buses, electric motors, components, passenger coaches, digital solutions and complete drives for environmentally-friendly public transport.

Thanks to the ecosystem of production sites, plants, repair services and engineering offices, the top-notch work of more than eight hundred design engineers, chief project engineers and designers, and the millions of euros invested in its own research and development every year, Škoda Group has a product portfolio of modern vehicles that meet the latest European standards. The company pays a great deal of attention to the use of cutting-edge technologies for modern public transport and railway vehicles. Škoda is also developing railway vehicles and buses with alternative propulsion.

Škoda Group vehicles are in operation in the Czech Republic, Slovakia, Germany, France, Finland, Poland, Lithuania, Latvia, Estonia, Italy, Mexico, the USA, and more countries around the world.

Škoda currently employs over 10,000 people. In addition to the Czech Republic, Finland and Turkey production sites and technology centres, Škoda Group has branches in Germany, Italy, Austria, Belgium, Hungary, Poland and Ukraine.

Škoda Group is part of PPF Group, which invests in several sectors, from financial services through telecommunications and biotechnology to real estate and engineering. PPF Group operates in Europe, Asia, and North America.

Škoda Group provides comprehensive transport solutions for cities, intercity transport and mainline railways, and continues to work to ensure that traveling anywhere is comfortable, fast, sustainable, and safe.

Thanks to a wide range of door entry heights, low-floor cars and barrier-free entry are provided. Each car can have either one or two pairs of doors.











The modern ForCity family of low-floor trams introduces smart public transport solutions. Altogether, several hundred of them have already been produced and can be found in several cities in the Czech Republic, Finland, Germany, Turkey, Slovakia, Latvia and Hungary, as well as China.

Škoda trams provide a sophisticated interior with plenty of seats and space for standing comfortably, and places for prams, wheelchairs or large luggage. Thanks to the low-floor concept of the ForCity line vehicles, even people with reduced mobility will find it easy travelling in them. They also include air conditioning and a clear information system enhancing passenger comfort. ForCity trams are also easy to maintain.

## FULL SERVICE

Comprehensive vehicle care and maintenance - also known as full service - is the current worldwide industry trend for maintenance. Full service entails a transfer of responsibility from the operator to the company providing the service, thereby guaranteeing available vehicles every day. The full service offered by Škoda Group not only guarantees preventive and corrective maintenance as well as repairs of products, but also diagnostics of faults and defects, quick response to defects, and also development in the field of obsoleting of spare part

obsolescence in cooperation with suppliers. At present, Škoda Group provides full service for trams in Pilsen, in the Hungarian city of Miskolc, in Cagliari, Italy, and in the Turkish city of Konya.

Škoda Group also offers both warranty services for its products aimed at eliminating the defects that typically arise during operation through corrective maintenance and repairs as well as support for the customer in the area of spare parts supply.

## ECOLOGY

The entire ForCity vehicle production cycle, from operation to disposal, is environmentally friendly. We comply with the EN ISO 14001 standard. Significant operating cost savings are achieved

due to low maintenance costs and reduced energy consumption. In addition, more than 95% of the components and elements the ForCity vehicles are made of are recyclable.

## MODERNISATION

Škoda Group also undertakes tram modernisations, which, above all, extend the service life of customers' vehicles, ensure easy availability of installed components, provide greater comfort and safety during transport for passengers,

and, last but not least, reduce negative environmental impacts.

The upgraded vehicles are also better adapted for transporting blind passengers and passengers with reduced mobility.



The ForCity modern tram series is state-of-the-art in the development of Škoda trams. Unlike the previous two types, Astra and Elektra, ForCity trams have a fully low-floor interior and bogies with a drive system located outside the wheels to make the vehicle entirely low-floor. The ForCity platform consists of trams with pivoting bogies, non-pivoting bogies and combinations thereof. Škoda Group has developed several technical solutions for its ForCity trams and is continuously working on their development.

The aim of setting up the ForCity platform was to satisfy a wide range of customers and to create vehicles that meet the different driving, landscape and climate conditions of different cities as well as the requirements of individual customers and modern trends in public transportation. Consequently, the ForCity trams offer tailor-made solutions for customers.

The common features of all vehicles include the same bogies, unified components, interior elements, a driver's cab and the interior layout above the bogies. Škoda Group's vast know-how includes every step of production of its vehicles from the first idea, design, all the main components of mechanical and electrical parts, final assembly, homologation, warranty and post-warranty service.

The ForCity platform is designed and supplied with pivoting and non-pivoting bogies, with partially- and fully-sprung drives and a liquid- or air-cooled engine.

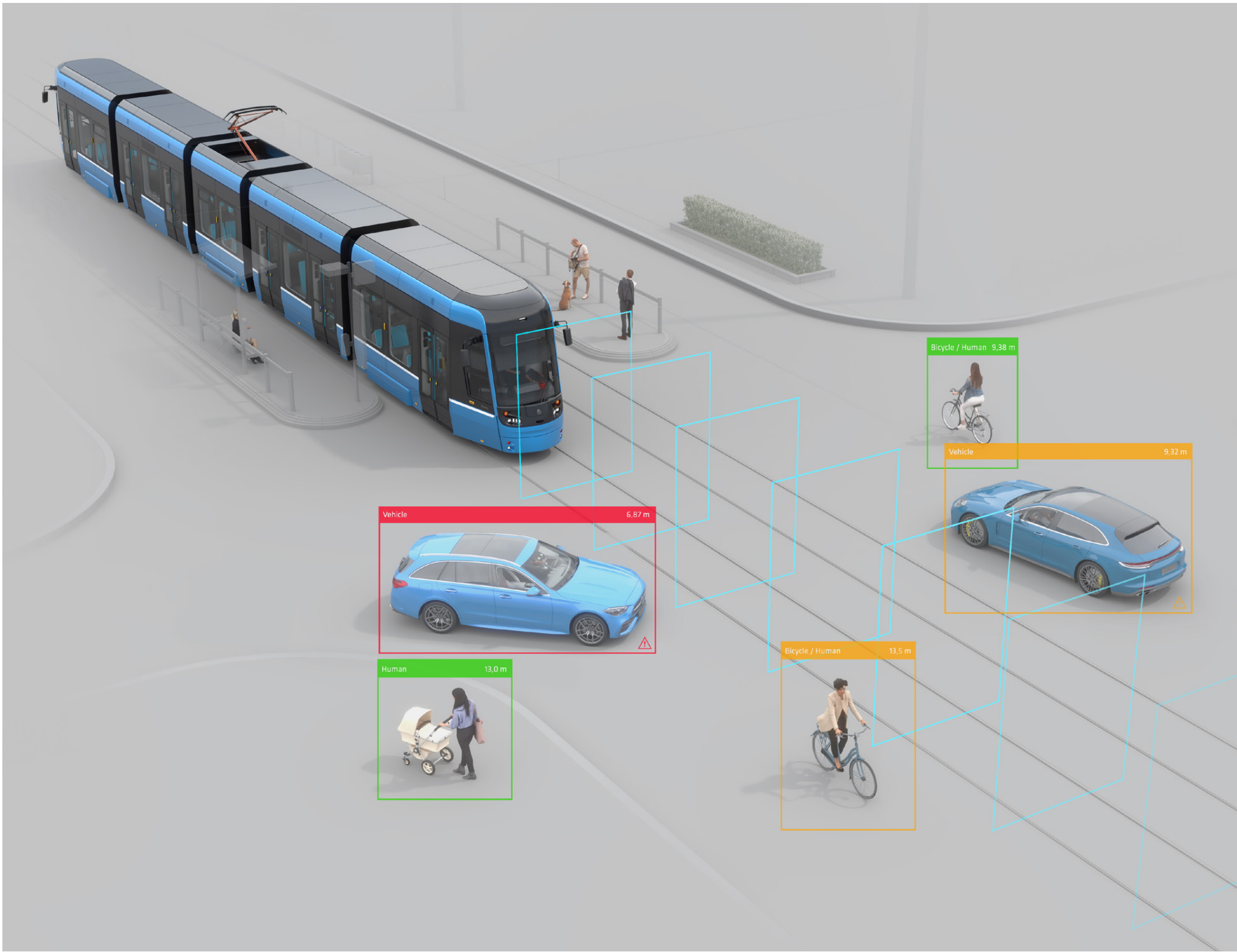
The ForCity Alfa tram's bogies are all pivoting and gearless, a design suitable for lines with demanding operating conditions. ForCity Classic vehicles are designed primarily for modern and less hilly lines because of the non-pivoting bogies. ForCity Plus provides a combination of pivoting and non-pivoting bogies ideal for demanding narrow-gauge lines. ForCity Smart, a highly-developed type of tram, is the latest addition to the ForCity family.



# ANTI-COLLISION SYSTEM ACCIDENT PREVENTION

Due to increasing demands on safety, each new tram will be equipped with a Škoda anti-collision system to reduce the likelihood of collisions in traffic. To do this, it uses a combination of dual LiDAR and HD-camera technology and precise localisation using off-line recorded HD maps and odometry.

This set-up allows the system to create a virtual driving tunnel in which the tram can detect obstacles within 10 cm, provide early warnings, minimise false positive warnings, and activate the emergency brake in time. The anti-collision system will thus help prevent major accidents and damage to health and vehicles.

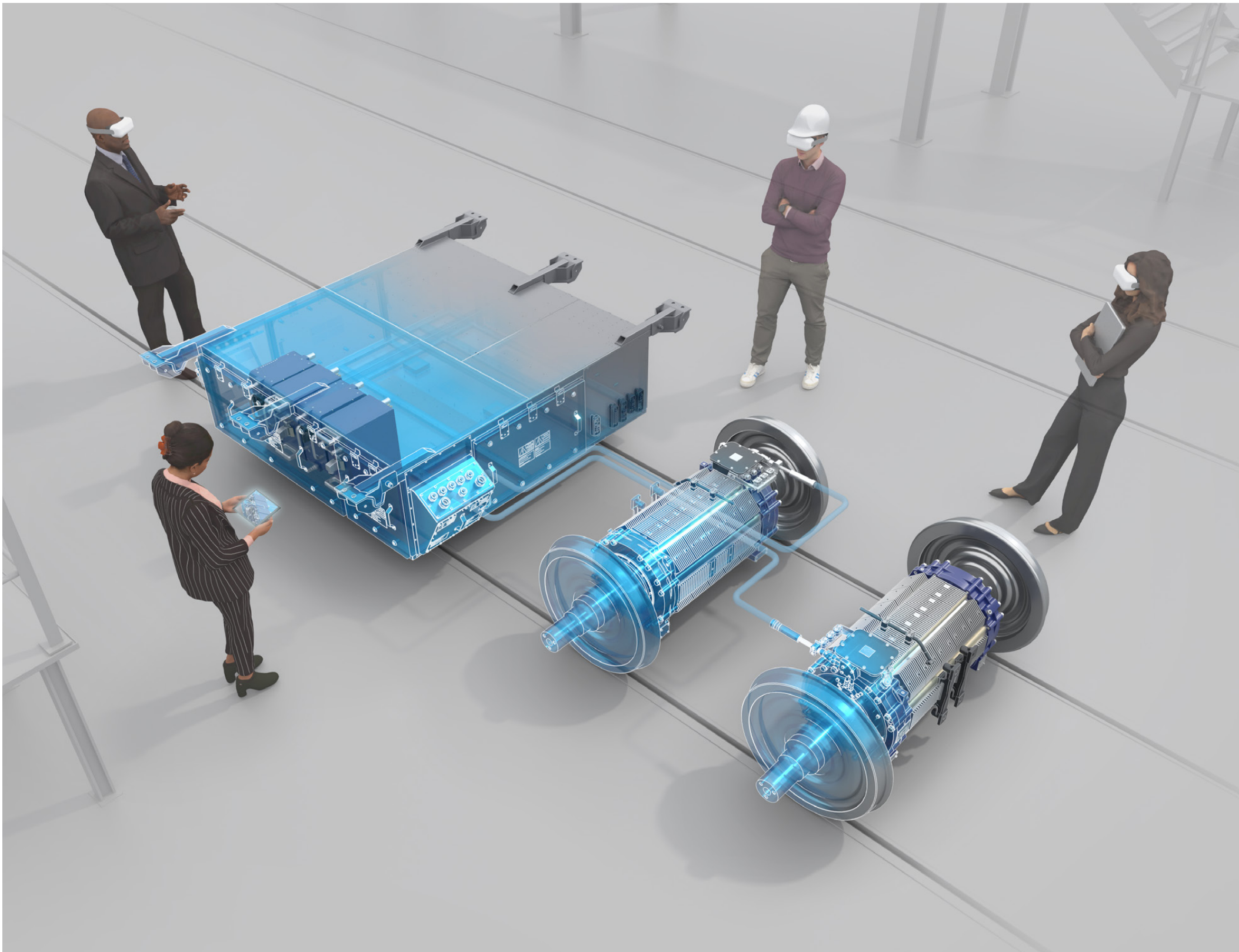




# SUSTAINABLE BRAKING TECHNOLOGY

Some of our new tram models are equipped with an electromechanical braking system, which was chosen for its efficiency and sustainability. The electromechanical brakes offer simple operation and maintenance, oil-free economy, and low operating costs. It will only function as an emergency, locking, and back-up brake. More precise and faster response and better control of deceleration smoothness will be provided by the electrodynamic motor brake, which is part of the drive and motor. The advantage of this solution is lower noise and the maximum possible rate of recuperation to a standstill.

The energy recovered from recuperation will be used primarily for servicing and operating the vehicle or returned to the grid to be used by another vehicle. This contributes to greater energy efficiency and a reduction in overall energy consumption. In addition, wear and tear on the brakes themselves and the track infrastructure is reduced. In comparison to a hydraulic brake system, it also does not contain hydraulic fluids, which not only makes it more environmentally friendly but also significantly reduces the time required for maintenance and returning the vehicle to service.














# FORCITY SMART

ForCity Smart combines many benefits for passengers and operators. The vehicle configuration achieves a balanced weight distribution on all the bogies. This leads to a low axle load and, in combination with the bogies, reduces operating costs for infrastructure maintenance.

ForCity Smart has excellent running characteristics and its configuration makes it perfect for high driving comfort and convenience. The lower number of bellows not only provides better sound comfort, but also improves thermal insulation of the vehicle while reducing operating costs.

ForCity Smart also provides a high number of seats. The technical solutions of the bogies and the vehicle make it possible to ergonomically distribute sixteen seats above the bogies.

Examples of vehicle length (in mm)	BASIC VEHICLE CONFIGURATION ● non-pivoting bogie / ● pivoting bogie	Passenger capacity – seated/standing (4 persons/m²)							
		Vehicle width							
		2,300 mm		2,400 mm		2,500 mm		2,650 mm	
		1	2	1	2	1	2	1	2
16,820		38/84	31/77	43/94	36/86	44/97	36/88	44/104	36/96
26,980		58/149	45/144	65/161	52/158	68/167	52/162	68/183	52/178
37,140		78/211	63/209	89/230	72/228	92/242	72/241	92/262	72/261
43,900		92/251	77/249	103/274	88/272	108/288	88/288	108/312	88/311
53,500		138/306	113/304	153/337	128/334	154/349	132/345	154/379	136/374
15,320		31/73	28/67	35/84	32/76	36/86	32/78	36/92	32/84
21,350		49/107	42/103	55/120	48/115	56/125	48/120	56/133	48/130
29,210		65/155	56/152	73/169	64/165	74/179	64/175	74/195	64/190
35,970		79/194	70/191	89/213	80/209	90/225	80/222	90/245	80/240
47,150		117/261	100/260	125/289	112/291	126/299	116/300	126/325	120/324

1 = one-way / 2 = two-way

## MAIN TECHNICAL PARAMETERS

Version	Unidirectional / Bi-directional			
Low floor	100%			
Track gauge	950–1,524 mm			
Maximal speed	80 km/h			
Contact voltage	600–750 V (+20% / -30%)			
Vehicle width	2,300–2,650 mm			
Performance	240–1,200 kW			
Longitudinal strength	up to 400 kN			
Number of tram sections	1	2	3	4
	2/2–100%	3/3–100%	4/4–100%	5/5–100%
	2/1–50%	3/2–65%	4/3–75%	5/4–80%
			4/2–50%	5/4–80%
Drive – number of bogies / number of drive bogies – adhesion				



# FORCITY SMART

The ForCity Smart tram for the Rhein-Neckar-Verkehr GmbH transport company is a bi-directional low-floor tram with pivoting bogies and a gauge of 1,000 mm. Škoda Group provides three lengths of these trams with the same technical design – three-section, four-section and six-section ones. Thirty-one 30-meter vehicles, thirty-seven 40-meter vehicles and twelve 60-meter trams will be in operation. The vehicles are equipped with a wide variety of innovations, such as state-of-the-art information systems and cameras. The maximum operating speed of these vehicles is 80 km/h.

Furthermore, these vehicles also have barrier-free access for wheelchair users and prams. These trams operate in Mannheim, Heidelberg and Ludwigshafen, which are located in three different federal states of Germany. These cities are in Baden-Württemberg, Hesse and Rhineland-Palatinate respectively.

MANNHEIM, HEIDELBERG,  
LUDWIGSHAFEN





# FORCITY SMART

BONN

ForCity Smart trams for Bonn are modern bi-directional, three-section, 100% low-floor vehicles with pivoting bogies. Operation is comfortable thanks to the full adhesion of its wheels. This provides for reliable driving characteristics even under adverse weather conditions. Transport companies will also appreciate the low operating costs.

The interior of the cars is designed in the spirit of ideas of what the future of tram transport will look like.

Passengers can look forward to comfortable, spacious, barrier-free vehicles, in the interior of which there are two large multifunctional spaces available for wheelchairs, prams or bicycles. The new trams have a clear information system with screens and panels. The trams also have a camera system, which significantly enhances traffic safety and prevents vandalism. The tram is 30 meters long and accommodates up to 180 passengers.





# FORCITY SMART

The three-section, two-way high-capacity ForCity Smart trams for Pilsen are 100% low-floor vehicles. Among other things, these trams provide a technical solution suitable for both sharp curves and the demanding climbs in Pilsen. The vehicles are also equipped with state-of-the-art information systems and cameras, as well as other innovations. Additionally, the interior of these vehicles is new, corresponding to today's trends and emphasizing functionality and simplicity. The trams are fully air-conditioned, which significantly increases passenger comfort.

Five double doors on both sides of the vehicle provide for quick passenger boarding and alighting. These trams comply with the latest European standards regarding vehicle body strength or vehicle body impact resistance, e.g. the vehicle's front frame is designed to better protect the driver and passengers in the event of a collision, while also considering other road users. The new driver's cab layout also provides a better view for the driver and more comfortable driving ergonomics.



# PILSEN





# FORCITY SMART

ForCity Smart trams for the transport company in Ostrava are two-section and 100% low-floor vehicles. These vehicles are equipped with USB ports and are fully air-conditioned, which significantly enhances passenger comfort. The maximum operating speed is 80 km/h, which these trams can make full use of on the newly planned lines in Ostrava, for example.

Further advantages of these vehicles include fully pivoting bogies and low axle loads, which save the track surface. Five double doors provide for quick boarding and alighting of passengers. These trams also comply with the latest European standards, including non-flammability requirements for the materials used, as well as for the strength and impact resistance of the vehicle body.



# OSTRAVA





# FORCITY SMART

BRNO

Škoda ForCity Smart trams for Brno are modern bi-directional, 100% low-floor vehicles with a pivoting bogie. Four traction bogies contribute to comfortable driving characteristics, ensuring a smooth ride even in bad weather. The operator will appreciate the low operating costs of the product from the Škoda ForCity Smart platform.

The tram has a capacity of up to 233 passengers with 64 seats, and it reaches a maximum speed of 70 km/h. The tram interior is designed in the spirit of the future of tram transport. Passengers can look forward to comfortable, air-conditioned, barrier-free vehicles with two large multifunctional spaces for wheelchairs, prams or bicycles. The new trams also offer a clear information system with screens and panels, and they are equipped with a camera system to help ensure traffic safety and prevent vandalism.





# FORCITY SMART ARTIC

HELSINKI

The ForCity Smart Artic Helsinki tram is the world's first mass-produced, narrow-gauge 100% low-floor tram with fully pivoting bogies. The all-wheel drive and the robust bogies and axle design make the operation trouble-free even under the demanding conditions of the Finnish capital. An axle load of less than 8.5 t contributes to infrastructure maintenance cost savings.

A powerful heating system was designed for Nordic conditions, including thorough thermal insulation and innovative brake energy use for vehicle heating. The vehicle's high utility value is underscored by its Scandinavian design.

With a length of 27.6 m and a width of 2.4 m, this unidirectional three-section tram with a gauge of 1,000 mm accommodates 125 passengers (5 people/m<sup>2</sup>), 74 fixed seats and 14 folding seats.





# FORCITY SMART ARTIC

ForCity Smart Artic Jokeri Line trams are 100% low-floor vehicles with pivoting bogies. The central part contains a tilting mechanism for barrier-free boarding and alighting of passengers.

The bi-directional five to seven-car tram ForCity Smart Artic has a gauge of 1,000 mm, is entirely low-floor and can accommodate 214 to 287 passengers (4 people/m²) with 82 to 108 seats depending on the number of vehicle sections.

The materials and technologies used make the vehicles suitable for operation in cold and highly corrosive environments. These trams have low vehicle life-cycle costs, and the design allows for easy corrective and fast daily maintenance. The vehicles are designed for the new Raide-Jokeri line, which connects the Finnish cities of Helsinki and Espoo, replacing the existing busy bus line.

## HELSINKI – JOKERI LINE





# FORCITY SMART ARTIC

ForCity Smart Artic Tampere trams are 100% low-floor vehicles providing a modern, proven technical solution suitable for demanding Arctic conditions.

The ForCity Smart Artic Tampere bi-directional tram has a gauge of 1,435 mm, is entirely low-floor and can accommodate up to 264 passengers (4 people/m<sup>2</sup>).

The vehicles are wheelchair and pram accessible.

An all-wheel drive and a bogies of a proven design with axles provide for trouble-free operation even under demanding climatic conditions. The materials and modern technologies of the vehicle construction also correspond to the Nordic climate belt, guaranteeing a vehicle service life of up to 40 years. The technical concept of the tram also enables extending the vehicle by one cell and thus increasing the maximum occupancy of the vehicle to 345 passengers.



## TAMPERE








# FORCITY CLASSIC

The ForCity Classic tram is representative of the most widespread low-floor tram type on the market. The concept and design provide for a wide modularity of vehicle length and width, track width, number of seats and supply voltage.

ForCity Classic is a tram with non-pivoting bogies. The vehicles are equipped with a rigid axle for good running characteristics.

ForCity Classic trams are 100% low-floor vehicles, which allows for quick boarding and alighting of passengers, as well as guaranteeing barrier-free access.

Given its dimensions, the advantages of the vehicle include a high capacity, balanced distribution of entrance doors along the entire length of the vehicle and its optimal passage profile, thanks to which it can be used even in areas with limited infrastructure.

Examples of vehicle length (in mm)	BASIC VEHICLE CONFIGURATION ● non-pivoting bogie / ● pivoting bogie	Passenger capacity – seated/standing (4 persons/m²)							
		Vehicle width							
		2,300 mm		2,400 mm		2,500 mm		2,650 mm	
		1	2	1	2	1	2	1	2
20,870		38/112	30/107	42/122	34/117	43/129	34/124	46/138	36/133
31,000		59/175	46/172	65/190	52/187	66/201	52/198	72/216	56/213
41,680		80/242	66/240	88/263	74/261	89/278	74/276	98/299	80/297

1 = one-way / 2 = two-way

## MAIN TECHNICAL PARAMETERS

Version	Unidirectional / Bi-directional			
Low floor	100%			
Track gauge	950–1,524 mm			
Maximal speed	70 km/h			
Contact voltage	600–750 V (+20% / -30%)			
Vehicle width	2,300–2,650 mm			
Maximum power	480–1,200 kW			
Longitudinal strength	up to 400 kN			
Number of tram sections	3	5	7	9
	2/2–100%	3/3–100%	4/4–100%	5/4–80%
	3/2–67 %		4/3–77%	5/3–60%
Drive – number of bogies / number of drive bogies – adhesion	4/2–55%			



# FORCITY CLASSIC

## BERGAMO

Bidirectional trams for the city of Bergamo are specifically designed for the new track set to be constructed in the city and out of its boundaries, marking a significant investment in sustainable urban transportation. A proven platform type of Škoda Group's tram – ForCity Classic, chosen for this project – represents the epitome of modern tram technology. Bidirectional tram will have five sections and three bogies, two of which are equipped with traction motors.

Our Bergamo tram specifically adapted for Bergamo sets a new standard in urban transportation with its exceptional features. A proven platform fully adapted for the Italian conditions will be 100% low-floor and is designed for persons with reduced mobility (PRM). Boarding of PRM passengers is eased by mean of automatic door extension operated by driver located at the doors closest to PRM places. This device will overlap distance between door edge and edge of the platform.

The ergonomically designed driver station offers unparalleled comfort, while the broad view from the cabin enhances safety and situational awareness. With a maximum speed of 70 km/h, the tram ensures efficient and swift transportation. Both the driver's cabin and passenger saloon are equipped with air conditioning, providing a comfortable environment for all during whole year. The inclusion of remote diagnostics enables real-time monitoring and proactive maintenance. Leveraging collaborations with Italian producers, the tram incorporates high-quality components, showcasing Škoda Group's commitment to excellence and international partnerships.





# FORCITY CLASSIC

ESKİŞEHİR

ForCity Classic Eskişehir trams are 100% low-floor trams with non-pivoting bogies and a gauge of 1,000 mm. The vehicles combine the elements used on vehicles delivered to the Turkish city of Konya and the ones from the contract for Bratislava (narrow gauge).

In addition to the trolley power supply, the vehicles have traction batteries that provide energy for a range of up to 5 km. After completing the section without an overhead contact line in Eskişehir, the vehicle without the contact wire will thus be able to be operated here as well.

The five-section unidirectional 30 m long and 2.3 m wide tram can accommodate almost 220 passengers (6 people/m<sup>2</sup>) with 41 seats. Four double and two single doors are used for quick passenger changes.

These vehicles are elegantly designed and fit into the color palette of Eskişehir.





# FORCITY CLASSIC

The ForCity Classic Konya tram design matches the Miskolc trams using the same components. The differences lies mainly in the reduced width of the vehicle (by 100 mm) and the installation of automatic couplings providing for the operation of large-capacity tram sets, as well as in the use of air conditioning units with increased power, which is required during hot summers.

The last twelve vehicles were equipped with a high-capacity battery that allows driving up to 15 km without having to rely on the mains supply. This ability is used on a line passing through the city center.

This five-section bi-directional tram with a length of 32.5 m can accommodate 210 passengers (4 people/m<sup>2</sup>) and has 60 seats.



KONYA



# FORCITY CLASSIC

## MISKOLC

ForCity Classic Miskolc trams represent the most common type of 100% low-floor trams suitable especially for modern and directionally easy tram networks.

Using three bogies instead of four, with each axle bearing a greater load, allows for a significant reduction in the vehicle's weight, good use of the track profile, and optimal operating and economic maintenance parameters.

With a length of 32.1 m and a width of 2.65 m, this five-section bi-directional tram with a gauge of 1,435 mm accommodates 220 passengers (4 people/m²) with 56 seats.

The large capacity of the vehicle is impressively complemented by a friendly design.

Furthermore, the bogies are based on a well-proven design with axles and double suspension, two of which are driven by powerful water-cooled asynchronous motors with a total output of 4 × 100 kW.





# FORCITY ALFA

The ForCity Alfa tram provides a very comfortable and variable interior with a high number of seats. Its advantages include a large transport capacity with a lower axle load.

The vehicle is equipped with pivoting bogies, the advantage of which is decreased track wear, thereby reducing the costs for vehicle and infrastructure maintenance.

ForCity Alfa also has the largest ratio of doors to vehicle length.

The ForCity Alfa trams provide simple and quick access to all seats in the entire vehicle space.

## MAIN TECHNICAL PARAMETERS

Version	Unidirectional / Bi-directional			
Low floor	100%			
Track gauge	950-1,524 mm			
Maximum speed	60-80 km/h			
Contact voltage	600-750 V (+20% / -30%)			
Vehicle width	2,300-2,650 mm			
Maximum power	184 kW × number of driven bogies (368-920 kW)			
Longitudinal strength	up to 400 kN			
Number of tram sections	2	3	4	5
Drive – number of bogies / number of drive bogies – adhesion	3/3-100%	4/4-100%	5/5-100%	6/4-80%
	3/2-70%	4/3-80%	5/4-80%	
		4/2-60%	5/3-70%	



# FORCITY ALFA

The ForCity Alfa Praha tram is the first worldwide mass-produced 100% low-floor tram with pivoting bogies, and it is also the first to have a unique drive with gearless motors with fixed magnets driving all wheels of the four axle-free bogies. The bogies are located under the transition bellows and under the ends of the vehicle, which creating maximum variability in the interior layout.

With a length of 31.4 m and a width of less than 2.5 m, this unidirectional three-section tram with a gauge of 1,435 mm accommodates 180 people (4 people/m<sup>2</sup>) – with 60 seats. Six wide double-leaf doors provide for very fast boarding and alighting, and together with the ability to pass through turns smoothly, the tram shortens travel times, speeding up traffic.

A total of 250 of these red and white vehicles with a unique and timeless design are already operating in Prague.



# PRAGUE





# FORCITY ALFA

ForCity Alfa Riga trams are similar to the ForCity Alfa trams designed for Prague. The main differences are the bogies adapted for the local wide-gauge tram line, whereas just three of the four bogies have a drive, corresponding to the level nature of the city, and the use of components suitable for harsh Nordic winters.

This unidirectional tram has the same length and width as the trams made for Prague and a gauge of 1,524 mm. It is a three-section vehicle for 189 passengers (4 persons/m<sup>2</sup>) containing 60 seats, while the extended four – section variant accommodates 255 passengers with 79 seats. An interesting feature is the lift allowing for a wheelchair to be loaded from road level at stations that do not have a platform.



RIGA







# FORCITY PLUS

ForCity Plus combines the advantages of a vehicle with pivoting and non-pivoting bogies. With pivoting bogies at both ends of the vehicle, the vehicle is 100% low-floor and has a standard gauge of 1,435 mm.

The arrangement of the interior in the end sections provides for the quick entry and exit of passengers and placement of multifunctional spaces, e.g. for people with reduced mobility or passengers with prams.

Additionally, ForCity Plus has an optimal passage profile suitable for European cities.

Furthermore, thanks to the pivoting bogies located on the outer sections of the vehicle, the wear when approaching and passing through turns is reduced.

Examples of vehicle length (in mm)	BASIC VEHICLE CONFIGURATION ● non-pivoting bogie / ● pivoting bogie	Passenger capacity – seated/standing (4 persons/m²)							
		Vehicle width							
		2,300 mm		2,400 mm		2,500 mm		2,650 mm	
		1	2	1	2	1	2	1	2
30,080		57/169	42/168	63/184	48/181	68/193	48/191	68/209	48/207
41,360		78/239	58/239	86/259	66/259	91/273	66/273	98/294	72/294
23,650		51/121	42/118	57/133	48/128	58/141	48/136	58/153	48/148
34,930		72/191	58/189	80/208	66/206	81/221	66/218	88/238	72/235
1 = one-way / 2 = two-way									

## MAIN TECHNICAL PARAMETERS

Version	Unidirectional / Bi-directional	
Low floor	80–100%	
Track gauge	950–1,524 mm	
Maximal speed	80 km/h	
Contact voltage	600–750 V (+20% / -30%)	
Vehicle width	2,300–2,650 mm	
Maximum power	480–1,200 kW	
Longitudinal strength	up to 400 kN	
Number of tram sections	2	3
	3/3–100%	4/4–100%
	3/2–60%	4/3–75%
Drive – number of bogies / number of drive bogies – adhesion	4/2–50%	



# FORCITY PLUS

The Škoda ForCity Plus Praha 52T is a one-way, five-part, 100% low-floor tram without a single step in the entire passenger compartment, including the space above the bogies, in a modern design created by a team of designers from Škoda Group led by Tomáš Chludil. It is 32 metres long, equipped with full-carriage green air conditioning with ecological refrigerant R290, an anti-collision system, automatic passenger counting, energy-saving LED interior and exterior lighting, and 70 padded seats, of which 44 are forward-facing and 26 are rearward-facing.

Prague, especially its historic centre, is typical for its narrow streets with sharp curves and steep gradients, significant height differences in the tram network, but also long and relatively straight routes. The development of the new tram for Prague considered all these facts as well as the technical requirements of the DPP resulting from the previous operating experience. The design of the new tram combines a multi-link vehicle with two pivoting bogies under the outermost links and two partly pivoting bogies under the inner chassis links. This combination allowed for a much more accessible, airy saloon for passengers with short, wider, and spacious joints, free of any steps or other barriers. It also ensures adaptability to any track profile and promises a smooth, comfortable, and quiet ride, as well as reduced wear and tear on wheels and tracks.



# PRAGUE



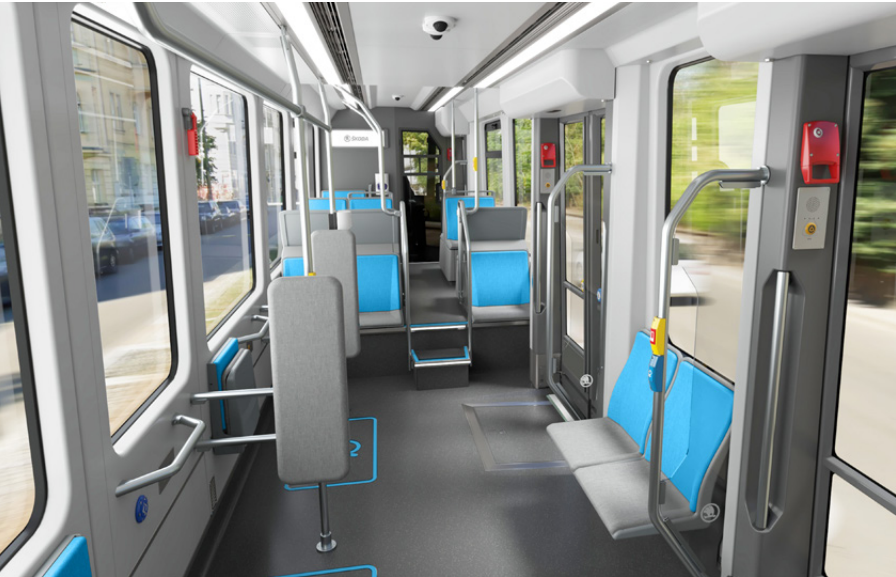


# FORCITY PLUS

The new Škoda ForCity Plus trams will replace the existing high-floor trams, which are nearing the end of their service life in the mentioned cities. Despite the high degree of similarity in the requirements and conditions of the cities, there are still special requirements which entail the supply of vehicles with two different widths. Thirteen of the 24 ordered vehicles will be delivered to Frankfurt (Oder), four and potentially eight more based on an option will be delivered to Brandenburg an der Havel, and the remaining seven plus thirteen more based on an option were ordered by Cottbus. This is the first tender in which the contracting authorities requested technically identical vehicles for three significantly different cities.

The cities will reduce their costs through a joint tender, whereby a common base vehicle is tailored to the specific environment and features of each municipality.

FRANKFURT (ODER), COTTBUS,  
BRANDENBURG AN DER HAVEL













Škoda Group metro trains are flexible and efficient transport solutions for large cities.

So far, the most modern metro trains are being delivered to the Polish metropolis of Warsaw, where up to 45 six-wagon metro trains are heading. Furthermore, NėVa metro trains are operating in St. Petersburg, Russia. The trains were developed with the aim of refreshing the existing fleet, and since 2013 they have been reliably running in regular traffic with passengers.

Škoda also has experience in extensively modernizing the Prague metro cars. It modernized a total of 93 trains, significantly extending their lifetime. The vehicles for the upcoming years meet all the highest safety standards, have an entirely new interior, traction motors with available recuperation functions, and a modern control system. Škoda also produced full traction equipment for metro trains in Budapest (Hungary), Kiev (Ukraine) and Kazan (Russia), as well as the Chinese city of Suzhou.

# MODERN ELECTRIC EQUIPMENT

Electrical equipment based on proven IGBT technology saves a significant amount of energy compared to previously operated trains. All the equipment is placed in traction containers, which are suspended under the floor of the cars. The supply voltage of 750 V DC is supplied by the third rail to the cars via four traction collectors.

The powerful electrical equipment includes electrodynamic braking with the option to recuperate energy, which brings significant savings not only in electricity consumption, but also a reduction in operating costs for the electro-pneumatic brake.

The metro train is easy and simple for the driver to operate thanks to an ergonomically-arranged desk equipped with a controlling device, a camera system display and a superior control, which provides for the collection and processing of data from individual parts of the cars. The train is also equipped with preparation for the installation of the mobile part of the automatic train control system.

# QUALITY AND COMFORT

The metro car interior is designed to create a comfortable environment for both passengers and the driver. The interior layout and audio-visual information system allow passengers to easily and quickly orient themselves in the car.

For boarding and alighting, all cars are equipped with four double doors on both sides. Additionally, the interior design of the cars provides for a maximum transport capacity of metro trains.

There are ventilation units in each car, which increase comfort when travelling by the St. Petersburg metro together with pleasant lighting.

Alternatively, an air conditioning system can be installed.

A modern camera system ensures both passenger and driver safety.



# METRO

## MAIN TECHNICAL PARAMETERS

Train layout	Mc+M+T+T+M+Mc
Car body material	Aluminium
Track gauge	1,435 mm
Maximum speed	90 km/h
Power voltage	750 V DC
Length of the train over the coupling	119,010 mm
Width of the wagons	2,710 mm
Floor height	1,140 mm
Wheelbase	2,100 mm
Wheel diameter maximum / minimum	850 / 770 mm
Asynchronous traction motor power	150 kW
Weight of an empty train / maximum weight	160,400 kg
Maximum axle load	140 kN
Number of seats	230 + 2
Overall capacity with 8 people/m²	1,680
Number of doors on the car	8
The smallest radius of any curve on the route / in the depot	150 m / 70 m
Maximum climb	45%
Maximum acceleration at the start	1.2 m/s²
Maximum braking deceleration	1.3 m/s²



# METRO

The new six-wagon trains for Warsaw accommodate up to 1,500 passengers. Their maximum speed is 90 km/h. The interior is designed to create a pleasant environment for passengers. The selected materials are resistant to normal wear and tear and violent damage, and they are easy to clean. The cars certainly meet the latest safety standards and are also equipped with a recording camera system.

During the development and design of the metro trains, great emphasis was placed on the safety and comfort of both passengers and staff.

The trains are designed according to EN and UIC standards, thus meeting the latest technical knowledge and requirements, e.g. in the field of fire safety. The trains provide for safe operation with minimum operating costs. In addition, there are a variety of comfort elements that make travelling more pleasant – a sufficient number of comfortable seats and a modern clear external and internal information audio-visual system; both wagons at the front are also equipped with space for disabled passengers, and each car also has space for a stroller and bicycle.



# WARSAW





# METRO

The Sofia metro as a very rapidly developing mean of transport plans to carry more than one million passengers a day at the final stage of its implementation. This effort will be soon supported by modern, state-of-the art metro units in four car configuration from Škoda Group, which will enter service in 2026 and will run on lines 1,2, and 4. In the Bulgarian capital, the metro also runs partly on the surface, to which the vehicle design is adapted. Given the warm climate of the region, the new vehicles will be equipped with efficient air conditioning, ensuring high comfort of transportation even during the warm summer months. In order to ensure accessibility to all passenger groups, the unit is equipped with priority seats, places dedicated to people with limited mobility and baby carriages. Smooth exchange of passengers is secured by 4 double leaf doors in each car side and levelling of the boarding edge to platform through secondary suspension. The vehicles are also equipped with a battery drive for easy manipulation in the depot (without the need to connect to the power supply).

The trains will be equipped with a safety system with automatic train operation. This system ensures safe journey on the route by regulating the speed of traffic and ensure operational safety. The trains will be powered by traction three-phase asynchronous motors, which are also produced by Škoda Group. The metro trains for Sofia will be manufactured at the production sites in Ostrava and Pilsen (Czech Republic). The Sofia metro operates on a standard gauge of 1 435 mm and is powered via a third rail and the nominal voltage is 750 V. The design speed of the new trains is 90 km/h.

# SOFIA





# COMPREHENSIVE MODERNISATION

Škoda Group not only produces new metro trains, but also modernises older vehicle fleets. The company also has extensive experience with the modernisation of the original Russian cars of the Prague metro. The new five-car trains 81–71 M, running on two metro lines, consist of two front cars, an inserted car with batteries and an inserted car with a compressor. Thanks to the renovation, it was possible to increase safety for passengers and drivers, significantly extend the lifetime of wagons and streamline maintenance and operation to such an extent that the parameters of the modernised trains are comparable to those of new vehicles. At the same time, passenger comfort has increased significantly.

The front part of the vehicle, including the driver's cab, has undergone a fundamental change. Reconstructed cars received new powerful compressors, pneumatic equipment, including air dryers and a computer control system. The cars have a modern traction drive with energy recovery during braking. They also meet the latest safety regulations, including the requirement for fire resistance and non-toxicity of the floor, interior lining and the cables used. Each of the cars houses a new modern fire alarm system. The interior of the wagons has been entirely redesigned, which provides enough comfort for seated and standing passengers, with a clear information system.

# FULL SERVICE

Škoda also provides complete service of metro trains. For example, in Prague the company performs full service in the largest service center, as well as in two of the three depots of the Prague metro. These are all repairs of the entire fleet on two lines of the Prague metro, so in total the company takes care of 93 modernized 81–71 M metro trains.

Maintenance and repairs take place 24 hours a day, 7 days a week. Škoda provides a high quality of work and precise

adherence to service intervals, as well as speed when returning repaired cars back into service. The company is not only responsible for the maintenance and repair of products, but also for the diagnosis of faults and defects, the cleanliness of the interior and exterior of the vehicle, including the removal of the consequences of graffiti and vandalism. The company also cooperates with suppliers on developments in the field of the replacement of obsolete spare parts.









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