Media Information

May 24, 2005

New Zafira: Second Generation of Compact Van Trendsetter

- Highly versatile seven-seater with dynamic design and performance
- Larger, high quality interior with driver-oriented cockpit
- World premiere: Panorama roof system with integrated storage compartments
- Wide range of engines from 100 – 240 hp, all diesels standard with particulate filter
- First van with electronic damping control and bi-xenon curve light

Rüsselsheim. With the new Zafira, Opel presents the second generation of its compact van trendsetter. It features dynamic design and driving performance as well as a high-quality interior with a driver-oriented cockpit. The patented Flex7 seating system continues to set standards and enables the Zafira to be easily turned from a seven-seat people carrier into a two-seater with up to 1820 liters cargo volume in a matter of seconds, without having to remove or cumbersomely stow away the seats. Further highlights of the new Zafira include a wide range of state-of-the-art engines, as well as an exceptional technology package. Making its debut is an innovative panorama roof system with integrated storage compartments, which creates a pleasant, light atmosphere for the passengers. Production of the new Zafira started in April in Bochum, Germany. Sales begin in July 2005.

Familiar from the Astra and now redeveloped for the Zafira, the IDS^{Plus} chassis (Interactive Driving System) with electronic CDC (Continuous Damping Control) ensures exciting driving. Other technical highlights offered for the first time in the compact van segment include steering-linked AFL bi-xenon headlamps (Adaptive Forward Lighting) with dynamic curve light. The exceptionally wide range of engines available for the new Zafira includes state-of-the-art units with displacements of 1.6 to 2.2 liters and power outputs from 74 kW/100 hp to 147 kW/200 hp. No competitor offers such a wide

variety of powertrains. In fall, the range will be expanded by the high-performance Zafira OPC with 176 kW/240 hp.

All diesel engines have latest-generation common-rail multiple direct injection and are available as standard with a maintenance-free Diesel Particulate Filter (DPF) in the Zafira. As a particularly economical and environmentally compatible alternative to the gasoline and diesel engines, there will be a natural gas variant (CNG Compressed Natural Gas) of the new Zafira in the future.

Successful original model: Around 1.4 million first-generation Zafira

In 1999, the Opel Zafira was the first compact van from a German manufacturer and the first van with a third row of seats that can be completely folded down and stowed away. It was this patented, easy-to-operate Flex7 seating system that was decisive for the success of the multiple award-winning bestseller. In Germany the Zafira immediately went to number one in its class when it was launched, and stayed there for four years in a row. It was also market leader in compact vans in Belgium, United Kingdom, Austria and Switzerland for a number of years. To date, a total of around 1.4 million units of the original Zafira have been produced and sold.

Sporty and elegant: Dynamic exterior design and high-quality interior

The new Zafira's look is confident, dynamic and unmistakeably related to the Astra, whose form language has been reinterpreted in compact van format. Its sportiness and elegance are magnified by the distinct V-shape tapering of the front and rear with the characteristic Opel crease line, the strong, rising body shoulder and the aerodynamic roofline gently sloping downward to the rear. The new Zafira's elegant and dynamic
looks are accentuated by eye-catching details such as large air inlets in the front bumper, visibly hi-tech, three-dimensional headlamps and taillights, as well as the trapezoidal-shaped, chrome-framed radiator grille with the Opel logo and characteristic chrome crossbar.

The spacious interior features high-quality materials, high-class finish and perfect ergonomics. The driver-oriented cockpit is an excellent example: all controls are positioned in optimal reach for the driver. The gear shift lever, for

instance, is positioned higher for easy, comfortable operation. This provided space for a newly-designed, U-shaped hand brake lever integrated in the center console, and an additional storage compartment.

The new instrument panel boasts chrome-ringed instruments (Edition upwards) and a clearly laid-out center console with a large, easy to read monitor. This displays all information for the state-of-the-art infotainment systems with intuitive operating concept, including units with DVD navigation and Bluetooth technology.

Spacious and flexible: Lots of room and maximum versatility without seat removal

In terms of comfort and space, the new Zafira is a step ahead of the first generation model. Thanks to its long wheelbase (2703 mm) and clever packaging, up to seven passengers have even more room in all three rows. The Flex7 seating system, now even easier to operate, ensures maximum versatility for all everyday transportation needs. In a matter of seconds, the Zafira can easily be turned from a seven to a six, five, four, three or two-seater, without having to remove or cumbersomely stow away the seats. The front passenger seat can also be ordered with a foldable seat back, fold-down table on the seat back, and a large storage compartment under the seat cushion to store items like an atlas. Depending on the equipment line, the new Zafira offers around 30 practical storage compartments and pockets for items of all sizes, making the spacious van an ideal family car. Another plus is the generous load capacity: the new Zafira has a maximum capacity of 1820 liters, 120 liters more than its predecessor, and in its five-seat configuration, generous cargo space of 645 liters - an increase of 45 liters - is available.

Cargo management: FlexOrganizer system ensures tidiness

The FlexOrganizer system from the new Astra station wagon is also available for the Zafira. This clever cargo management system is comprised of two horizontal side rails each on the left and right of the luggage compartment, which have adjustable mounting points to allow flexible attachment of various retaining straps, hooks, dividers and storage boxes. In this way, every type of cargo can be safely, comfortably and neatly transported.

World premiere: Panorama roof system with five integrated storage compartments

The optional panorama roof (standard in the Cosmo) with integrated storage facilities makes its world premiere in the new Opel Zafira. With its four large glass panels, the system offers passengers a particularly pleasant, light atmosphere. Dark tinted glass and a power-operated shading system provide protection against strong sunlight.

And the center roof console running down the length of the ceiling houses five different-sized compartments for additional storage space.

Active and passive safety: SAFETEC system for high-level protection

The Zafira´s SAFETEC system ensures a high level of safety, combining all standard active and passive safety elements. These include, for example, ABS with electronic brake force distribution and cornering brake control, brake assist, the electronic stability program ESP^{Plus} as well as a comprehensive restraint system. This includes airbags in front, thorax/pelvis side airbags for driver and front seat passenger, as well as head curtain airbags for the front and both outer seats in the second row. The latter also come ex-works with mountings for the ISOFIX child's seat system. Additional passive safety equipment includes active head restraints in front and decoupling pedals (PRS Pedal Release System). Seat occupancy detection for the front passenger seat and TPMS (Tire Pressure Monitoring System) are available as options.

Ready for future: New Zafira already complies with EU pedestrian protection guidelines

The second-generation Zafira is leading the way in pedestrian protection: the new Zafira is the first Opel model to comply with EU guidelines on pedestrian safety for new models to be introduced from October 1, 2005, making it one of the first cars to meet these requirements. Thanks to the vehicle front's sophisticated design with yielding structures around the bumper, headlamps, hood and fenders, the risk of injury to pedestrians in the event of a collision is reduced.

Variety: Wide range of gasoline and common-rail diesel engines

Lively and economical performance is ensured by the new Zafira's wide range of engines. Customers can choose between three diesel and four gasoline units from the ECOTEC family with power outputs of 100 to 200 hp. In fall, the range will be extended with the high-performance Zafira OPC with 176 kW/240 hp.

The current top-of-the-line engine is the sporty 147 kW/200 hp 2.0 turbo gasoline unit with a top speed of 225 km/h. This is followed by a 2.2-liter gasoline direct injection engine (110 kW/150 hp) and a new 1.8-liter unit (103 kW/140 hp) with variable camshaft phasing.

The entry-level gasoline engine has 1.6-liter displacement (77 kW/105 hp) and innovative fuel-saving TWINPORT technology.

Three state-of-the-art 1.9-liter common-rail turbo-diesel engines with multiple direct injection round off the powertrain program for the new Zafira. The 1.9 CDTI units are offered in three output levels – 74 kW/100 hp, 88 kW/120 hp, 110 kW/150 hp – and come standard with a maintenance-free Diesel Particulate Filter (DPF).

Zafira OPC: Exclusive sports van with 240 hp gasoline turbo engine follows in the fall

In the second half of the year, the high-performance OPC will crown the Zafira range. The Zafira OPC is powered by a 176 kW/240 hp 2.0-liter turbo gasoline unit. The powerful engine with maximum torque of 320 Newton meters takes the top performer from zero to 100 in just 7.8 seconds, and with a top speed of 231 km/h, makes it the fastest production van in Europe. The Zafira OPC has standard IDS^{Plus} chassis (Interactive Driving System) with electronic CDC (Continuous Damping Control) for maximum driving dynamics and 18-inch alloy rims with 225/45 R 18 tires. The OPC's sporty appearance is underlined by distinctive features, such as the typical OPC honeycomb grille, the strongly profiled side sills, a twin exhaust system with trapezoidal tailpipes and an exclusively designed interior with Recaro sport seats.

New Opel Zafira: Technical Data Overview

Engines					
Gasoline engines		**1.6 TWINPORT® ECOTEC®**	**1.8 ECOTEC®**	**2.2 DIRECT ECOTEC®**	**2.0 Turbo ECOTEC®**
Emissions standard compliance		Euro 4	Euro 4	Euro 4	Euro 4
Fuel		super unleaded	super unleaded	super unleaded	super unleaded
Number of cylinders		4	4	4	4
Bore	in mm	79.0	80.5	86.0	86.0
Stroke	In mm	81.5	88.2	94.6	86.0
Displacement	in cm^3	1598	1796	2198	1998
Max. output	in kW (hp)	77 (105)	103 (140)	110 (150)	147 (200)
	at rpm	6000	6300	5600	5400
Max. torque	in Nm	150	175	215	262
	at rpm	3900	3800	4000	4200
Compression ratio		10.5 : 1	10.5 : 1	12.0 : 1	8.8 : 1
Transmission / Final drive ratio					
5-speed manual		● / 4.19	● / 3.94	–	–
6-speed manual		–	–	● / 3.83	● / 3.94
5-speed Easytronic		–	O / 4.19*	–	–
4-speed automatic		–	–	O / 2.81	–
6-speed automatic		–	–	–	–
Trailer load in kg					
Manual transmission / automatic					
Unbraked		750	750	750	750
Braked at 12% gradient		1000	1200	1500	1500[1)]

Engines				
Diesel engines		**1.9 CDTI ECOTEC®**	**1.9 CDTI ECOTEC®**	**1.9 CDTI ECOTEC®**
Emissions standard compliance		Euro 4	Euro 4	Euro 4
Fuel		diesel	diesel	diesel
Number of cylinders		4	4	4
Bore	in mm	82.0	82.0	82.0
Stroke	in mm	90.4	90.4	90.4
Displacement	in cm^3	1910	1910	1910
Max. output	in kW (hp)	74 (100)	88 (120)	110 (150)
	at rpm	3500	3500	4000
Max. torque	in Nm	260	280	320
	at rpm	1700 – 2500	2000 – 2750	2000 – 2750
Compression ratio		18.0 : 1	18.0 : 1	17.5 : 1
Transmission / Final drive ratio				
5-speed manual		–	–	–
6-speed manual		● / 3.65	● / 3.65	● / 3.83
4-speed automatic		–	–	–
6-speed automatic		–	O / 3.08	O / 2.77*
Trailer load in kg				

Manual transmission / automatic				
Unbraked		750	750	750
Braked at 12% gradient		1200	1300 / 1400	1500[1)]

*Performance and fuel consumption data for 1.8 ECOTEC and 1.9 CDTI (150 hp) to follow
● = Standard, ○ = Optional
[1)] 1650 kg for trailers with low aerodynamic drag such as horse and boat trailers, as well as transport trailers with up to 1.40 m total height, maximum 10% gradient.

Engine data						
	Driving performance		Fuel consumption (l/100 km) according to 1999/100/EU			
	Maximum speed in km/h	Acceleration from 0 – 100 km/h in seconds	Urban	Extra-urban	Combined	CO_2-emissions in g/km
5-speed						
1.6	176	14.3	9.2 – 9.4	5.9 – 6.1	7.1 – 7.3	170 - 175
1.8	197	11.5	10.1 – 10.3	6.2 – 6.4	7.6 – 7.8	182 – 187
6-Speed						
2.2 DIRECT	200	10.6	11.3	6.4	8.2	197
2.0 Turbo	225	9.0	13.3	7.3	9.5	228
1.9 CDTI [74 kW]	174	14.1	7.7	5.2	6.1	165
1.9 CDTI [88 kW]	186	12.2	7.7	5.2	6.1	165
1.9 CDTI [110 kW]	202	10.4	7.8	5.3	6.2	167
4-speed automatic						
2.2 DIRECT	190	11.6	11.6	6.7	8.5	204
6-speed automatic						
1.9 CDTI [88 kW]	182	12.5	9.8	5.7	7.2	194

All data refer to the European base model with standard equipment. The consumption data according to 1999/100/EU takes into consideration the vehicle's curb weight as stipulated by this regulation. Additional equipment can lead to slightly higher fuel consumption and therefore CO_2 exhaust emissions than the declared values. In addition, they can raise the vehicle's curb weight and in some cases also increase the gross vehicle weight, the maximum allowable axle loads and respectively reduce the permitted trailer load. Therefore the maximum speed may be decreased while acceleration time can be increased. The published performance figures are possible with the vehicle's curb weight excluding driver plus a 200 kilogram load allowance.

Car dimensions in mm	
Length	4467
Width with extended / retracted exterior mirrors	2026 / 1801
Height (at curb weight) excl. / incl. roof rails	1635 / 1645
Height (at curb weight) with panorama roof	1670
Wheelbase	2703
Track, front	1488
Track, rear	1510
Turning clearance in m	
Wall-to-wall	11.50
Curb-to-curb	11.10
Luggage compartment dimensions in mm	
Floor length to rear seat backs 2 / 3 row	1088 / 405
Floor length with rear seat backs folded forward	1809
Width at wheelarches	1071
Maximum width	1114
Height of sill	590
Height of trunk-lid opening	893
Luggage capacity (l) according to ECIE	
Luggage compartment only (7-seater)	140
With third row seats folded forward (5-seater)	645
With all rear seat backs folded forward, up to ceiling (2-seater)	1820
Weight and axle load in kg	
Curb weight incl. driver (according to 70/156/EU)	1505
Gross vehicle weight	2075
Payload	570
Maximum axle load, front	975
Maximum axle load, rear	1115
Maximum roof load	75

Executive Statements on new Opel Zafira

Carl-Peter Forster, President, General Motors Europe

"The overwhelming interest in our European "Million Mile Test Drive" program and increasing numbers of customer orders show that buyers are regaining confidence in the Opel brand. We will further strengthen this confidence with innovative, advanced and high-quality products. The new Zafira features all these characteristics and will continue the success story of its predecessor. Following the outstanding start of the new Astra generation, this is further proof of Opel's creativity as the innovative brand at the heart of GM's European business."

Hans H. Demant, Managing Director, Adam Opel AG
and Vice President, Engineering, General Motors Europe

"We have equipped the new Zafira with a unique technology package including innovations such as the adaptive IDS^{Plus} chassis with continuous damping control, and steering-linked AFL bi-xenon headlamps, which are available for the first time in this market segment. The panorama glass roof with integrated storage facilities makes its world premiere in a production vehicle in the new Zafira. A further highlight is the wide range of state-of-the-art gasoline and CDTI diesel engines with power outputs from 100 to 240 hp. No other brand offers such a wide variety in this segment."

Reinald Hoben, Executive Director, Manufacturing, Adam Opel AG
and General Motors Europe

"Opel has again reached a level of manufacturing quality in new cars which rivals that of its strongest competitors. The highest standards of quality control were also the priority during the production-start of the new Zafira. We thereby

continue to follow the same strategy that has proven so successful for the Vectra and the new Astra generation."

Bryan Nesbitt, Executive Director, Design, General Motors Europe

"The new Zafira looks confident, dynamic and clearly related to the Astra, whose form language has been reinterpreted in compact van format. Designing the front of the car was a real challenge, as we needed to merge our image of a progressive and dynamic design with requirements for increased pedestrian protection. We are very proud of the result. For me, the Zafira is the 'new face' of compact vans."

Alain Visser, Executive Director, European Marketing, Adam Opel AG

"With 1.4 million units sold, the first Zafira-generation was a true bestseller and confidently led its market segment in several European countries for a number of years. In addition to those of its successful predecessor, the new Zafira features a host of new qualities. The Flex7 seating system, which continues to set standards, has been further refined and the new Zafira offers even more room for passengers and luggage. Spaciousness and ingenious versatility - without having to remove the seats – combined with innovative technology make the new Zafira an ideal car for active people and families."

Jean-Marc Gales, Executive Director, Sales, Marketing and Aftersales, Adam Opel AG

"We are very proud of the fact that we can offer the new Zafira at a lower price than its comparably-equipped predecessor. Customers who order now can also take advantage of the attractively priced "First Edition" introductory offer. Our dealers are highly motivated and, as I found out in many personal conversations with them, are really looking forward to the new Zafira. The fact that we offer a particulate filter as standard with all diesel models makes a long-term contribution to the success of the second generation Zafira."

Market and model

A New Chapter in the Success Story

- Forecast: Compact van segment in Europe will grow to more than ten percent by 2010
- Opel aims to sell more than one million new Zafiras in the same period
- High customer loyalty and up to 40 percent conquest rate potential

While the automobile market in both Europe and Germany has grown only slightly or even stagnated for a number of years, new registrations in the compact van segment have continuously increased. From 1999 to 2004, the compact vans' share of the passenger car market in Europe climbed from 2.4 percent to more than seven percent. Forecasts predict further growth and levels of over ten percent in the year 2010. If the Meriva compact van segment is added, experts predict a share of the overall passenger car market as high as 17 to 18 percent in 2010. Opel is well positioned with these monocabs and has strongly influenced this segment's growing importance with pioneering innovations. The Zafira debuted in spring 1999 as the first seven-seat compact van with the Flex7 system's fully retractable third row of seats. This was followed in the summer of 2000 by the Agila, the first microvan from a European manufacturer, and in 2003 by the Meriva with the multi-variable FlexSpace concept in the minivan segment.

Successful trendsetter: Around 1.4 million first-generation Zafira

The first-generation Opel Zafira successfully defended its position as a trendsetter despite ever-increasing competition in the segment. Its success story is unrivalled. As the first van with fully retractable seats in the third row, it surpassed all expectations from the very start and redefined the market for compact vans – accompanied by decidedly positive media coverage as well as numerous prizes and awards. These included "Car of the Year" in various European countries a number of times, and readers of the German specialist

journals “AUTO Strassenverkehr” and “mot” chose the Zafira as the “Most Attractive Car” in the compact van class four consecutive times.

In Germany the Zafira immediately went to number one in its class when it was launched, and stayed there for four years in a row. The seven-seat van was equally successful elsewhere in Europe and was market leader in compact vans in Belgium, Great Britain, Austria and Switzerland for a number of years. A total of around 1.4 million first-generation Zafiras were built and sold.

Two factors were decisive for the Zafira's success: it was the first fully-fledged seven-seat model in the compact van segment and with its Flex7 seating system, offered a still unrivalled versatile seating concept that was extremely easy to operate. With a few simple adjustments, Flex7 turns the Zafira from a comfortable seven-seater into a six, five, four, three or two-seater with generous cargo space in a matter of seconds, without having to remove or cumbersomely stow away the seats.

The new Zafira is ideally positioned to continue its predecessor's success story. The unique, versatile Flex7 seating system, which has been refined, is complemented by a host of new, attractive features, including:

- dynamic design and driving performance
- high quality and interior with high-class look and feel
- a driver-oriented cockpit
- a comprehensive safety concept
- the world's first panorama roof system
- an incomparably wide range of engine/transmission combinations
- a maintenance-free particulate filter standard with diesel versions
- two-year manufacturer´s warranty with no kilometer limit
- extraordinarily diverse program of comfort, convenience and high-tech equipment, including systems available for the first time in this class, such as Adaptive Forward Lighting (AFL) with dynamic curve light and IDS^{Plus} chassis with Continuous Damping Control (CDC)
- the FlexOrganizer system for clever cargo management

Conquest rate potential of up to 40 percent predicted

With the Zafira, Opel addresses families with children – parents aged between 31 and
55 have accounted for almost 70 percent of buyers in this segment so far – as well as active people of any age who need a very versatile car with plenty of space.

Thanks to its qualities as a multi-functional seven-seater, its dynamic design and driving behavior, together with its many innovations and novel panorama roof with integrated storage compartments, the new Zafira will also attract the attention of drivers of other car brands. Opel marketing experts anticipate a high conquest rate - depending on the country, up to 40 percent of buyers could be tempted away from the competition. This is strengthened by the three new, exceptionally economical, state-of-the-art 1.9 CDTI engines (100, 120 and 150 hp), all available with diesel particulate filter as standard. These common-rail units will enable the Zafira to capture a significantly larger share of the diesel compact van segment.

The largest markets for the new Zafira remain Germany at the top of the list, as well as Great Britain, France and Italy. Marketing experts at Opel expect to find large customer potential within the ranks of previous Zafira owners, as satisfaction with their car gives them more than enough reason to remain loyal to the Opel brand.

Design

Confident and dynamic look

- Harmonious front end styling with integrated pedestrian protection
- Best aerodynamics in compact van class

The new Zafira's looks are dynamic, sporty and confident. Its front end is unmistakably related to the successful Astra, but with the formal language reinterpreted in compact van format. The design of the Zafira's front end also had to satisfy additional pedestrian protection requirements. Malcolm Ward, its Chief Designer, is particularly proud of the result: "We have transformed legal requirements relating to pedestrian protection from a potential disadvantage into an visual advantage. The harmonious, pioneering front-end design of the new Zafira will make its mark in the compact van class."

From the front, from the side, from the rear – the new Zafira is dynamic from every angle. This dynamism comes from the van's balanced proportions and the ideal relationship between length (4467 mm), width (1801 mm with folded mirrors) and height (1635 mm without roof rails). From this starting point the designers have made use of technically configured details, distinctive graphic elements and the interaction of taut surfaces with striking lines to create an emphatically dynamic appearance that clearly distinguishes the new Zafira from its competitors.

The front end is dominated by the wide, trapezoidal-shaped, chrome-framed radiator grill with Opel logo and characteristic chrome crossbar, which flows seamlessly into the engine hood. With its prominent crease, this is a classic Opel design feature. The central fold and the athletic V-shape are major elements of a common styling approach running through the interior to the rear. Together with the large, central air intake beneath the front bull bar, they further underline the dynamic front end styling.

The dynamic front end conceals a new safety concept

Although not evident at first glance, Opel's designers and engineers have incorporated advanced passive pedestrian protection measures into the Zafira's front end concept. Energy-absorbing elements around the bumper and an engine hood specifically designed for improved cushioning in the event of an impact help to reduce the risk of serious leg and head injuries to pedestrians, cyclists and motorcyclists in the event of a collision. The new Zafira is the first Opel model and one of the first cars at all to comply with EU pedestrian safety guidelines for new models that will come into force on October 1, 2005.

Formal harmony and development of Opel's design language

Strongly-defined, arrow-shaped "tucks" at the front and rear make the Zafira appear shorter than it actually is – even though the new model is 150 millimeters longer than its predecessor. The newcomer's compact, well-proportioned dimensions, with the width
(+ 59 mm) also increased, are emphasized by the three-dimensional design of the headlamps integrated into the Zafira's profile. Their facetted surfaces and technically interesting details are further evidence of Opel design language moving towards greater self-confidence and autonomy.

An aerodynamic roofline and a bold profile define the silhouette

A striking feature of the Zafira's silhouette is the roofline, the rear section of which slopes gently away, and the tapered lateral belt line, which interact with each other to create a visual impression of dynamism. This is strengthened by the long wheelbase (2703 mm). Added to this are the flowing transition of the A-pillar into the front side panel of the body and the C-pillar, positioned well back, which facilitates access to the rear seats and also enhances the view for their occupants. In addition to the steep side panels, the broad, powerful shoulders extending through from front to rear enhance the impression of stability and strength. The side view is also notable for the distinctively shaped wheel arches suitable for wheels up to 18 inches in diameter, which

are available for the new Zafira in this size from the factory for the first time. Together with the wide track (1488 mm at the front and 1510 mm at the rear), the well-defined side sills underline the vehicle's athletic visual image.

The roof of the new Zafira slopes away gently at the rear, thereby emphasizing the aerodynamic lines of this compact van, which has a drag coefficient of c_D = 0.31 – the best in its class. The passengers do not incur any loss of space, however. On the contrary: despite its dynamic exterior lines, the new Zafira offers the generous interior space for which Opel is well known. Many of its dimensions are again greater than those of its predecessor. The spacious feeling is further enhanced by the upright side windows, which convey a pleasantly light, airy sensation. The large rear doors provide easy access and simplify the fitting of children's safety seats in the second row. The long door windows improve both the view for rear passengers and all-round visibility for the driver.

A powerfully-shaped rear end with easy access to the load area

The new Zafira's dynamic stature is also evident when it is seen from the rear. The designers have transferred the V-shape of the front to the tailgate and rear bumper as a distinctive styling element. The wide, panoramically curved rear window provides an ideal view out of the back of the vehicle and creates an even greater impression of power. The three-dimensional tail lamp units with chrome surrounds highlight the body's broad shoulders. An elegant chrome strip, the center of which conceals a sensor field for unlocking the tailgate, joins the tail lamps visually. The third brake light (which uses light-emitting diodes) lies flush within the upper edge of the tailgate. The distinctive rear-end design has practical benefits: the tailgate lifts to a wide angle to provide access for loading, while the low loading lip permits easy loading and unloading of the spacious, versatile load area.

Innovative panorama roof makes an outstanding design statement

The optional panorama roof (standard on the Cosmo) celebrates its world premiere in the new Opel Zafira and makes a very special kind of visual statement. With its dark tinted glass, the system, together with the silver-colored roof rails, makes the compact van highly elegant in appearance, and also offers passengers a particularly pleasant, bright atmosphere.

Four large glass panels ensure a light-filled interior and at the same time provide a view out of the top of the vehicle – especially welcome during trips to the mountains, for example.

When the sun's rays are strong, the dark tinted glass prevents the interior from becoming too warm. A fully-synchronized power-operated shading system can be activated if required: each of the four glass panels is simultaneously covered with a sunshade.
A further benefit of the panorama roof is that the middle section houses a roof console extending along its full length and incorporating five different-sized, outward-opening storage compartments. The special design of the panorama roof means that headroom at all seven seats is virtually unchanged.

Opel presented its concept of a panoramic glass roof system with integrated storage compartments for the first time in the "Snowtrekker" compact van study. This concept vehicle had its debut at the Detroit Motor Show in January 2000 and was well-received by the press and the public. Opel designers and engineers have now developed this innovative roof concept to production readiness for the new Zafira.

Interior and equipment

High-quality interior and unrivalled flexibility

- A driver-oriented cockpit and even more space for passengers and luggage
- Unrivalled Flex7 seating system is now even easier to use
- World innovation: panorama roof with integrated storage compartments
- High-tech extras available for first time in compact van segment

Four wide-opening doors and a generously dimensioned tailgate mean plenty of space and easy access for passengers and luggage in the new Zafira. Get into it, and two things are immediately evident: increased space and a sense of high quality feel throughout. Side trims or seat upholstery, instrument panel or roof lining – high-class workmanship and selected materials create an impression of distinction in the new Zafira down to the very last detail.

The spacious interior features high-quality materials, high-class finish and perfect ergonomics. The driver-oriented cockpit is an excellent example: all the controls are clearly arranged and ergonomically positioned in easy reach of the driver. The principal infotainment and telephone functions (depending on the system) can be remote-controlled from the high-grip three-spoke steering wheel (standard in Edition upwards). The three-dimensional anti-glare instruments (tachometer, rev counter and fuel gauge) are back-lit and ringed in matt chrome (standard in Edition upwards); they are easily readable and located below a compact hood. The center console contains the state-of-the-art infotainment systems with an intuitive operating concept in double radio-panel format, including units with DVD navigation and Bluetooth technology and the module for heating/ventilation or air conditioning (standard in Edition upwards) or electronic climate control. The central display screen in monochrome or color – measuring up to 6.5 inches depending on the model – is positioned high up above the center console for the best possible readability.

Another notable feature is the new gear shift lever layout: it has been moved back to a half-height position where not only is it particularly convenient for the driver but also provides sufficient space for a U-shaped handbrake lever integrated in the center console.

The innovative design of this lever, reminiscent of the controls in an airplane cockpit, has tangible functional benefits. For instance, it leaves room for a large central tray. There is also less risk of the handbrake being released unintentionally, as the release catch is at the side of the lever, which has to be pulled up slightly at the same time. Less effort on the part of the driver is needed to apply or release the handbrake, as the necessary tension is built up by simultaneous pressure on the brake pedal. Finally, acoustic decoupling when the handbrake is applied deadens the characteristic ratchet noise.

More headroom and shoulder room in all three rows

The new Zafira's extra length (+ 150 mm) and width (+ 59 mm) compared with the previous model benefit the occupants first and foremost. Not least as a result of the long wheelbase (2703 mm) and the intelligent interior layout, up to seven passengers now have even more space in all three seat rows. For example, shoulder room at the front has been increased by 25 mm and in the middle row by 24 mm. In addition passengers at all seats now enjoy even more headroom, which has increased by 26, 17 and 14 mm in the first, second and third seat rows respectively. This has been made possible by careful detail design of the seating. The driver above all benefits for example from a slighter lower seat, which, in conjunction with the redesigned cockpit and the improved gear shift position, provides more intimate, sportier contact with the vehicle.

The versatile Flex7 seating system is now even easier to use

The Opel Zafira's seating is an entirely new development, with one exception – the patented Flex7 seating system, with its still unrivalled versatility, which derives in principle from the previous model. Frank Leopold, Manager Vehicle Packaging, explains: "During development of the Zafira interior concept, we looked at various different systems and came to the conclusion that our Flex7 system is still the best. No other van based on a compact car model offers adequate space for up to seven people and a comparable level of variability and user friendliness." Detail aspects of this highly praised system, which can

provide up to seven seats, have been further optimized, with the result that the new Zafira offers even greater practical value and user convenience.

New operating elements make it even easier to adjust the second row of seats, while the height of the head restraints in the first and second rows can be varied more easily thanks to a user-friendly press-button mechanism. Practical benefits remain: in a matter of seconds and with child-like ease, the Zafira can be converted from a seven-seater into a six-, five-, four-, three- or two-seater, without having to remove seats or stow them away inconveniently. The front passenger's seat can also be ordered with a folding backrest and a fold-down table on the seat back as an optional extra. The folding front passenger seat back enables loads measuring up to 2.71 meters in length to be stowed safely and easily inside the vehicle.

Up to 1820 liters of storage space provide plenty of room for luggage

Not only can the new Zafira accommodate up to seven people, it can also be converted into a two-seater with impressive load volume with just a few simple operations. The new compact van has a maximum loading capacity of 1820 liters – 120 liters more than its predecessor. In the five-seat configuration, a generous load space of 645 liters – an increase of 45 liters – is available. Depending on the equipment line, up to 30 storage compartments and pockets, which can be used for both large and small items, are of particular benefit to families and during long trips. They include, for example, a drawer beneath the passenger seat (standard in Edition upwards), a compartment with drinks holders in the tunnel console, storage compartments next to the front seats, a compartment for glasses in the roof lining (standard in Sport) and cup holders in the rear side panels or in the back of the central second-row seat.

The tire repair set is easily accessible in a compartment in the right-hand load-area side trim; the warning triangle and first-aid kit are securely located in the tailgate trim, where they can be easily reached at any time. If the full complement of seven seats is used, the roll-up load-area cover (standard in Edition upwards) is placed in a holder behind the third seat row.

The FlexOrganizer system keeps the Zafira's load area tidy

The tried and tested FlexOrganizer system as featured in the Astra and Vectra station wagon is now also available for the Zafira. This clever load management system comprises various transportation and storage elements.

The system is based on four horizontal rails on the sides of the load area; these have adjustable mounting points for the attachment of various retaining straps, hooks, dividers and storage boxes. In this way, almost every type of cargo can be transported safely, comfortably and neatly. In order not to detract from the functionality of the system, the lower seat belt mounts for the third seat row can be released and secured to a magnetic holder above the rails.

Glass panorama roof system with five integrated storage compartments

The optional panorama roof (standard in the Cosmo) with integrated storage facilities makes its world premiere in the new Opel Zafira. The system occupies the entire roof area, and, with its four large glass panels, offers passengers a light-filled interior and a unique journey experience. Tinted glass provides protection against strong sunlight. A power-operated shading system can be operated if required: it simultaneously covers each of the four glass panels with a sunblind. The center console running along the full length of the roof contains five different-sized compartments for additional storage space. The easily accessible compartments, which open in the direction of travel, offer around 20 liters of storage space in total.

Four Zafira equipment lines from the start

Opel will be introducing the new Zafira in four model lines – the Zafira, the Edition, the Sport and the Cosmo. The particularly sporty, exclusive OPC variant will be launched in the fall. Even the entry-level Zafira model has an extraordinarily comprehensive range of standard equipment. The entire SAFETEC safety system is standard on all Zafira models: it includes IDS suspension (Interactive Driving System), ESP^{Plus}, ABS, Brake Assist, a flashing brake light in the event of ABS braking and automatic activation of the hazard warning flashers if an airbag or seat belt tensioner is triggered. SAFETEC also includes front, side and head curtain airbags, seven head restraints (of which the two front restraints are of active design), three-point safety belts for all seats and disk brakes front and rear.

Standard equipment also includes convenient, functional features such as power heated exterior mirrors, power windows in front, a height-adjustable driver’s seat, tachometer, cruise control, a height and reach-adjustable steering column, electro-hydraulic power steering, a pollen filter, green-tinted heat-absorbing glass and remote-control central

locking, not to mention numerous storage compartments and drinks holders. A foldable, easily cleaned carpet supplied as standard protects the floor of the load area against dirt.

The Zafira Edition has color-keyed door handles, exterior mirror housings and protective side moldings. Other additional features include air conditioning, the powerful stereo-CD-radio CD 30, six loudspeakers and remote operation from the steering wheel, chrome-ringed instruments, a removable load-area cover, a stainless steel loading edge protector, a drawer under the passenger seat and an extra pocket on the back of each front seat.

The Zafira Sport has agile settings for its IDS sport suspension and can be identified externally by its 16-inch alloy wheels in wide 5-spoke design and 205/55 R 16 tires. Inside, this Zafira model owes its special sporting style to the leather-covered steering wheel, the sport front seats (with an adjustable lumbar support in the driver's seat), special upholstery materials, chrome decor applications and center console as well as perforated aluminum sport pedals.

The Cosmo is currently the top model in the Zafira series. Its extensive equipment line is similar to that of the Zafira Sport, but does not include IDS sport suspension. Instead, its passengers can enjoy the glass panorama roof with integrated storage compartments and electrically-operating shading system, which comes as standard in this version of the Zafira. The Cosmo also features stainless steel window trim moldings, decorative aluminum front door sill trim strips and illuminated inside front door handle recesses. There is also an illuminated make-up mirror in the passenger's-side sun visor.

For individual needs: equipment packages and individual options

In addition to the four equipment lines, Opel offers a comprehensive choice of custom extras for the new Zafira – some grouped together into packages, others also available
as individual options. Seven different packages offer lots of options for customizing the Zafira to meet personal preferences and needs.

Overview of the equipment packages for the new Zafira:

Package	**Equipment**
FlexOrganizer package	• Side rails in the luggage compartment • Load-area divider net • Pocket-style side net • Load attachment hooks and adapters
Lighting package	• Two reading lamps in front • Battery discharge protection
Visibility package	• Automatic anti-glare inside mirror • Automatically controlled center console illumination • Rain sensor at front • ALC automatic low-beam headlamps • Two reading lamps at front • Battery discharge protection
Seat Comfort 1 package	• Seat back angle adjustment for the driver • Adjustable lumbar support for the driver
Seat Comfort 2 package	• Adjustable lumbar support for driver and front passenger • Seat height and angle adjustment for driver and front passenger
Trail package	• Detachable trailer tow hitch • Trailer stability program • Automatic ride height control • Hill Start Assist (HSA) • Deflation Detection System (DDS)
Winter package	• Headlamp cleaning system • Multiple-setting front seat heating • Footwell heating for 3rd seat row

Extras can be ordered separately, depending on the model, and offer a wealth of opportunities for individualization. For example, a wide range of alloy wheels – including 18-inch wheels in 225/40 R 18 format and in three different designs – is available for the first time for this compact van.

High-tech extras available for the first time in the compact van segment

A big choice of high-tech accessories that Opel launched for the new Astra generation is now available as optional extras for the Zafira and in some cases for the first time in this class.

For example Adaptive Forward Lighting (AFL) with dynamic curve light and adaptive highway light functions including bi-xenon headlamps for high and low beams. Another segment first is the IDS^{Plus} suspension system with CDC (Continuous Damping Control). Further highlights are TPMS (Tire Pressure Monitoring System), the 'Quickheat' heating system, that prevents windows from fogging or icing up during the winter after they have been scraped clear, and the Hill Start Assist. The HSA enables comfortable and safe start on uphill slopes, preventing the car from rolling backwards without requiring use of the handbrake.

Open & Start for even greater convenience

As another optional extra, the new "Open & Start" keyless driving authorization system offers a high level of user convenience. The doors and tailgate can be opened manually without key activation if the driver is carrying the electronic key. Briefly touching the sensors in the door handle locks the vehicle. The doors and tailgate can of course also be opened or closed by remote control. The "Open & Start" system is operated by antennas in the vehicle, which communicate automatically with the key. The engine starts when the start/stop button next to the steering column is pressed.

An extensive program of high-quality infotainment systems

Six different high-quality infotainment systems are available for the new Zafira, ranging from the CC20 stereo cassette/radio to the DVD 90 Navi, a stereo CD/radio with a DVD-supported navigation system, color info display and an MP3-compatible CD player. In contrast to the CD Navi 70 system that is also available, the DVD 90 Navi has a digital travel guide with a convenient search and select function and the additional advantage of map and navigation software for 21 European countries on a DVD-ROM.

The Twin-Audio System can also be supplied on request. Additional headphones for the second seat row enable the driver/front passenger and those at the rear to listen to different programs. All systems are perfectly integrated into the Zafira's interior design and feature a user-friendly, easy to understand operating concept.

A comprehensive range of accessories for varied customer requirements

Already extremely versatile and practical, the Zafira can be made into an even more multi-purpose, individual vehicle with a host of different Opel accessories. For example, an innovative mobile phone pre-installation kit including a hands-free device, optionally with Bluetooth technology. This system is compatible with all conventional mobile telephones. It comprises a universal console and a phone-specific adapter. Once installed in the console, the mobile is fully networked with the Zafira's infotainment system (CD 30 system upwards) and can be operated via the steering-wheel remote controls. The menu-guided graphic info display shows the system status.

Other accessories are a choice of attachments for the roof rack system, age-specific child's seat systems and multifunctional boxes for keeping food and drinks cool or warm as required.

The OPC line package lends the Zafira a sporty look, and comprises a front spoiler and rear apron lip, side sills and a roof spoiler.

Body and passive safety

Spacious, Aerodynamic, High Protection Potential

- New dimensions inside and out, best aerodynamics in its class
- SAFETEC system: Extensive passenger protection as standard
- Pioneer in pedestrian protection

The second Zafira generation is more dynamic, boasts larger exterior dimensions and more interior space for passengers and luggage. Development engineers also succeeded in further enhancing its aerodynamics. Although the previous model led the way when it was launched (c_D = 0.33), the new Zafira raises the standard much higher. Its drag coefficient of c_D = 0.31 is again the best among compact vans. With a drag index of c_D x A = 0.76 (product of drag coefficient and frontal area), the new Zafira is, overall, around five percent more aerodynamic. The new generation of this seven-seat trendsetter provides highest levels of active and passive safety, and is a pioneer in pedestrian protection.

Body concept: Intelligent lightweight design and significantly greater rigidity

The Zafira's chassis is essentially based on the new Astra's architecture, which has been modified and reinforced for the larger and heavier Zafira. Opel/GM engineers have completely redesigned the front end and body, and systematically optimized rigidity, strength, crash behavior and pedestrian protection.

The new Zafira has a lightweight body, with up to 51 percent consisting of high to ultra-high-strength sheet metal. Much of the lower section consists of "tailored blanks", tailored high-strength steel panels with thickness varying between 0.75 and 1.5 millimeters. They ensure ample strength in areas subject to stress, without making the overall assembly unnecessarily thick and, as a result, heavy.

Torsional rigidity, which was good on the previous model and ensures precise handling, was increased by 30 percent. Flexural strength, important for occupant comfort, has gone up by 74 percent. Opel's engineers achieved this with measures such as optimization of

the tailgate opening in the body, reinforcement of the door sills and precision work on the sheet-metal thicknesses and weld points. Vibrational behavior, a critical factor if a sense of solidity is to be achieved, was also significantly reduced. All parts prone to corrosion are fully galvanized, and the anti-perforation warranty is valid for 12 years.

Three load paths absorb impact energy

The new Zafira's optimized crash behavior is based upon proven Opel safety research principles. For instance, the energy generated in a head-on collision is absorbed by three load paths. The rigid, bending-resistant front cross members, the bumper and the front axle enable distribution of the impact energy over a wide area through the front-end structure, where kinetic energy is absorbed primarily by systematic deformation of the front frame, wheel assembly and subframe. The high-strength occupant cell is the next energy-absorbing stage after these defined deformation zones. Various design measures further significantly reduce the risk of footwell and front firewall intrusion compared with the previous model.

The new Zafira is also particularly safe in side-impact collisions, since the force of the impact is channeled over a wide surface area into the body structure by reinforced A and B-pillars, sills and doors with a reinforced, bending-resistant door well and wide, ultra-high-strength steel impact protection guards. The large bow-shaped door handles are not only a sign of solidity and quality, but also make it easier to access the interior if an accident should occur. The energy absorption zone for rear-end collisions is restricted as far as possible to the area behind the third row of seats. The high-strength occupant cell is located in front of this deformation zone. The rear frame and wheel housings are made from tailored blanks, thus minimizing the chances of damage to the plastic fuel tank and tank filler pipe in the event of a collision.

SAFETEC system includes all active and passive safety elements

The particularly stable, rigid bodyshell with sophisticated energy-absorbing deformation zones forms a solid base for the new Zafira's SAFETEC system, which includes all standard active and passive safety elements. While numerous active safety systems such as ABS, ESP^{Plus} and Brake Assist help to prevent accidents before they happen, a comprehensive network of protective devices ensures the highest level of passive safety should a collision occur. The new Zafira's restraint system includes front airbags for the driver and front passenger, thorax/pelvis side airbags in front which also protect the hip area, and head curtain airbags for the front and the two outer second-row seats. All seats are fitted with three-point safety belts. These are height-adjustable in the front and outer second-row seats; those for the driver and front passenger seats are also fitted with safety belt tensioners. The front seat occupants also benefit from active head restraints that help to reduce the risk of whiplash injury in the event of a rear-end impact. These head restraints are height-adjustable, as are the five others in the new Zafira. Designed to maximize driver protection, the Pedal Release System (PRS) is an Opel patent which automatically decouples the clutch and brake pedals from their mountings at a particular level of impact, thus minimizing the risk of injury in the footwell in the event of a frontal collision.

In order to prevent multiple pile-ups and warn other road users of a hazardous situation, the hazard warning lights are activated as soon as an airbag or belt tensioner is triggered. The doors are unlocked at the same time to ease access to or exit from the vehicle.

Ideal for families – ISOFIX child's seat mountings

The new Zafira is an ideal family car, with mountings for the ISOFIX child's seat system as standard on the two outer seats in the second row. The rear doors are also fitted with 'childproof' safety locks. Seat occupancy detection for the front passenger's seat is available as an option. It prevents the front and side airbags on the passenger's side from being triggered if the seat is not

occupied or if a child’s seat fitted with the corresponding transponder is installed.

Zafira one of the first vehicles to meet new EU pedestrian protection directive

The new Zafira is one of the first vehicles at all and the first Opel model to already comply with European Union guidelines on pedestrian safety for new cars, which come into effect throughout the EU on October 1, 2005. For instance, the law requires conducting tests with a special test-dummy lower leg, as well as impact tests with a pre-determined head impactor. Because the implementation of future standards had a major impact on styling, body structure and packaging, and had to harmonized with other objectives as well, Opel formed interdisciplinary teams in which engineers specializing in design, production, vehicle integration, vehicle safety, type approval testing and simulation worked closely together.

This resulted in a number of design-related measures intended to reduce the risk and level of injuries to pedestrians in the event of lower leg or head impact, including resilient foam in front of the aluminum bumper cross-member and special bumper reinforcement. A series of design measures relating to the engine hood was also required. For example, the hood panel itself is a thin steel sheet only 0.6 millimeters thick, strengthened by a lean steel structure just 0.5 millimeters in thickness with circular cutouts and recesses (“muffin tin” design). The hood hinges are deformable, as are the side fender mounts. There is a defined deformation zone in the impact-damage area under the engine hood, and the components located directly below it are designed to yield under load, for example the plastic servicing panel with perforation points and the multi-section water deflector.

Wolfgang Hahn, Manager, Vehicle Safety, at the International Technical Development Center (ITDC) in Rüsselsheim, explains: “The Zafira is one of the first vehicles on the market to satisfy the new EU pedestrian protection directive. It makes an important contribution to the protection of more vulnerable road users and underlines Opel’s expertise in implementing innovative safety concepts. By working in interdisciplinary teams, we were able to solve issues arising from the conflicting objectives of sometimes contradictory requirements.”

Computer simulation ensures high quality and development efficiency

Opel has a long history of using state-of-the-art computer technology to develop new vehicle models. A simulation-based development process including a much improved finite element method was used for the new Zafira. The level of detail in this simulation model is evident from the number of elements used in the calculations. For example, at almost 2.3 million, the total number utilized in the head-on crash model was seven times higher than for the previous model. As a result – just like the first time, when the new Astra was being developed – a series of expensive hand-built prototypes was not needed. The computer simulations enabled the engineers to define and implement problem-solving methods more quickly and with greater precision. Computer simulation was also indispensable for compliance with the new EU pedestrian protection directive, but its applications are not restricted to areas in which safety is a primary concern. For instance, the new Zafira spent just 410 hours in a “genuine” wind tunnel during optimization of its aerodynamic properties. In addition, almost 100,000 CPU hours - hours per processing unit in the ITDC’s high-performance computer - were spent on the simulation. State-of-the-art technology also enhances occupant comfort. In the aeroacoustics area, for example, it was possible to reduce interior wind noise by 2.5 decibels. The new Zafira now boasts the best aerodynamics in its vehicle class.

Chassis and active safety

Innovative Technology for Dynamic Driving

- IDS chassis system provides outstanding agility and high safety reserves
- Premiere in the van segment: IDS^{Plus} chassis with electronic damping control
- Van debut: steering-linked AFL bi-xenon headlamps
- Active accident prevention enhanced by “pulsed” brake lights

The second Zafira generation features outstanding driving safety as well as exceptional agility and a comfortable ride. These characteristics are ensured by a body structure even more rigid than its predecessor, a longer wheelbase (2703 mm), wider track (1488 mm in front and 1510 mm in rear), a center of gravity that is low for a van, and the Interactive Driving System (IDS). Familiar from the new Astra, the highly-praised IDS has been further developed by Opel/GM engineers for the second-generation Zafira and specifically tailored to its vehicle architecture.

The adaptive IDS^{Plus} chassis with Continuous Damping Control (CDC) brings a new dimension to driving fun, active safety and comfort in the van segment. Until its entry into the compact class in the new Astra, CDC was only available in luxury and exclusive sports cars. Opel now makes this technology available to compact van customers for the first time.

The new Opel Zafira’s SAFETEC safety package, unique in this vehicle class, is complemented by a host of innovative technologies, including Adaptive Forward Lighting (AFL) with steering-linked bi-xenon headlamps, trailer stability program, TPMS (Tire Pressure Monitoring System) and “pulsed” brake lights, which flash prominently in the event of emergency braking.

IDS chassis: Components in perfect interaction

The second-generation Zafira´s IDS chassis is distinguished by optimal interaction between its mechanical components and its sophisticated, electronically-aided chassis control systems. Precise handling and driving comfort are ensured by the McPherson front suspension with hydro-formed subframe and the torsion-beam rear axle of double-walled U section, which has been awarded numerous patents. On this solid basis, the networked electronic driving control systems can function to their fullest effect. These systems include the ESP^{Plus} Electronic Stability Program with understeer control logic and targeted braking at several wheels, TC^{Plus} Traction Control, CBC (Cornering Brake Control), the latest-generation ABS and Brake Assist. The Zafira's dynamic character is further enhanced by Electro Hydraulic Power Steering (EHPS); the power steering is map-controlled (except in Zafira 1.6 TWINPORT) to provide optimal steering assistance in every driving situation.

For driving characteristics that are even more dynamic than those in the standard version, Opel offers the Zafira with a stiffer IDS sport chassis, which comes with a SportSwitch (also standard in Zafira Sport and with IDS^{Plus}). A simple press of this button in the cockpit activates a sport mode that offers more direct steering and gas pedal response.

Horst Bormann, Chief Engineer, Chassis, outlined the challenges that faced his team while working on the interaction between the electronic and mechanical components: "An extremely dynamic yet responsive chassis with high safety reserves is perfectly feasible. A high-comfort design can also be realized without difficulty. The biggest challenge is to reconcile these two extremes. The standard of the result for the new Zafira is higher than ever before in the van segment."

The IDS^{Plus} chassis system enhances both safety and driving fun

The adaptive IDS^{Plus} chassis system with electronic damping control (CDC) and networking of all driving dynamics systems (ICC – Integrated Chassis Control) is entirely new in the compact van segment and available as an option with the

Zafira. Sophisticated electronics architecture with three CAN-bus (Controller Area Network) systems enables the various regulating units to communicate with one another, whereby a high-speed data bus with a transmission rate of 500 kilobytes per second is used for the chassis control.

An integral part of the IDS^{Plus} chassis system, CDC is based on four shock absorbers controlled by solenoid valves that precisely and continuously adjust the damping to ideally adapt to road conditions, vehicle movements and driving style. Together with additional CAN-bus signals (e.g. vehicle speed and steering angle speed), three body and two wheel acceleration sensors supply the electronic control unit with the information needed for optimal damping. The control unit calculates the necessary damping force required at each wheel in real time. The networking between CDC and ESP^{Plus} is particularly advanced. The CDC system is informed continuously of the steering angle and yaw rate and in turn the CDC damping function is controlled by ESP in critical situations. Damping on alternate sides of the vehicle counteracts over or understeering in borderline situations. This dynamic roll rate adjustment integrated in ESP^{Plus} can be described as a “virtual stabilizer”.

The IDS^{Plus} chassis system provides an important safety benefit, with minimized wheel-load fluctuations that enhance the grip of the wide 205/55 x 16 tires (17 or 18-inch available as an option), thereby reducing stopping distances. It also achieves a significant improvement in ride comfort as the damping forces at the individual wheels reduce body movement and balance out ride-height changes, even on extremely uneven surfaces. Brake dive and acceleration squat are almost completely eliminated.

The IDS^{Plus} system also enables the driver to select an even more agile mode by simply pressing the SportSwitch in the cockpit. This controls the shock absorber settings, gas pedal response and the characteristics of the electro-hydraulic power steering. The shift points of automatic and Easytronic automated manual transmissions are raised to higher rpm. The SportSwitch is standard on vehicles with automatic transmission or Easytronic – even those without the IDS sport chassis (standard for the Zafira Sport) or the IDS^{Plus} system – and enables the driver to activate more progressive gas pedal and transmission control characteristics.

Active accident prevention: “Pulsed” brake lights help prevent rear-end collisions

The new Zafira's ABS with disk brakes all around ensures effective deceleration in all driving situations. In the event of emergency braking, a two-stage brake booster with brake assist immediately increases brake pressure, thus shortening braking distance. When ABS is activated, the brake lights flash at a frequency of up to four pulses per

second to warn following traffic. Visual signals of this kind reduce reaction time by valuable fractions of a second and thereby help to prevent rear-end collisions. The Zafira is one of the first vehicles in the world to incorporate this innovative safety feature.

Trailer stability program stops yawing motion

Problem-free towing is ensured by various options such as fully automatic levelling control, Hill Start Assist (HSA) and the innovative trailer stability program, which comes with the detachable tow hitch. The trailer stability program immediately recognizes and corrects any yawing movements of the trailer. As soon as the ESP^{Plus} sensors detect a deviation from the chosen path, the engine is throttled back and the brakes applied, repeatedly if necessary, to quickly stabilize the car-trailer combination until it is safely back on course. The trailer stability program does not, however, intervene in drivers' actions, for instance during extreme or sudden steering when an avoidance maneuver is necessary. High trailer loads of up to 1500 kilograms are another advantage of the new Zafira.

Additional functions in the new Zafira for increased active safety include:

- **Understeer Control Logic (UCL):**

If understeer occurs, speed is first reduced by closing the throttle and then by braking the front wheels. When the ESP control range is reached, braking pressure decreases at the outer front wheel and simultaneously increases at the inner rear wheel until the vehicle is back on track again.

- **Hill Start Assist (HSA):**

This system eases drive-off on uphill gradients by preventing the car from rolling backwards without use of the handbrake. Brake pressure is maintained for 1.5 seconds after the brake pedal is released, giving the driver enough time to select a gear and step on the accelerator. Brake pressure is released as soon as the vehicle starts to move forward.

- **Deflation Detection System (DDS):**

Wheel speed sensors activate a warning lamp when a tire’s rolling circumference decreases as a result of falling tire pressure. The warning signal is triggered when the pressure loss reaches approx. 30 percent.

As the DDS does not require special wheel sensors, it supplements the tire pressure monitoring system, if, for example, winter tires without TPMS sensors are fitted.

- **Tire Pressure Monitoring System (TPMS):**

TMPS complements the DDS function and shows the tire pressure with an accuracy of up to 0.1 bar. Signals from the four wheel sensors are sent to a receiver inside the car and the pressure is shown on the computer display in the cockpit. The driver is warned if tire pressure drops to 0.3 bar below a preset value.

- **Automatic levelling system (Nivomat):**

Automatic levelling control provides the optimum vehicle ride-level under all load conditions, thus maintaining driving comfort and safety even with a car-trailer combination or when the car is fully loaded. The “Nivomat” is installed at the rear axle instead of conventional spring/shock absorbers (not available with IDS^{Plus} and IDS sport chassis) and automatically raises the rear of the vehicle to a defined level after it has been driven for a few meters. It obtains its energy from the relative movement between the axles and the body. This gives the “Nivomat” a fuel economy advantage compared to externally powered levelling systems.

Premiere in compact van segment: Steering-linked bi-xenon headlamps

The Zafira is the first compact van to feature an AFL bi-xenon headlamp system with dynamic curve light. The steering-linked headlamps of the Adaptive Forward Lighting (AFL) system improve illumination on twisting country roads and highways by up to 90 percent. The swivelling motion is regulated by a computer-controlled stepping motor depending on driving speed, steering wheel and front wheel angle parameters registered by the sensors. At higher speeds along a straight road (highway light), the low beam automatically rises slightly to project longer beam distance, while a beam width regulator prevents the light from blinding oncoming traffic.

Automatic Lighting Control (ALC) is also an important active safety feature. Two sensors on the windshield analyze light levels: the ALS (Ambient Light Sensor) measures brightness in the immediate vicinity, while the FSS (Far

Sight Sensor) measures light conditions further ahead of the car. If both sensors register poor light, the headlamps are switched on automatically.

Engines and transmissions

Wide Range of State-of-the-art Engines from 100 to 240 hp

- Premiere in Zafira: 1.8 ECOTEC engine with continuously variable camshaft phasing
- All diesels with maintenance-free diesel particulate filter as standard
- New high-performance 240-hp OPC version to join Zafira program in fall
- CNG natural gas variant in the pipeline

The new Zafira generation keeps its promise of convincing driving dynamics with its design, chassis and range of engines and transmissions – the most versatile and one of the most modern in the van segment. At its launch, four gasoline and three diesel engines with displacements from 1.6 to 2.2 liters and power outputs of 74 to 147 kW (100 to
200 hp) are available. In the fall, a 176 kW/240 hp high-performance version of the
2.0-liter turbocharged gasoline engine will be added to the Zafira OPC model. This engine has a maximum torque of 320 Nm, takes the Zafira OPC from zero to 100 km/h in just
7.8 seconds and makes it Europe's fastest series-production van with a maximum speed of 231 km/h.

As with the previous model, a particularly economical and environmentally compatible natural gas unit (CNG – Compressed Natural Gas) will be available later as an alternative to the gasoline and diesel engines.

All engines feature sophisticated technologies and dynamic driving performance combined with efficient fuel consumption and environmentally-friendly characteristics, as they all belong to the modern ECOTEC engine family and comply with the Euro 4 emissions standard. All the diesels have newest-generation common-rail multiple direct injection and a maintenance-free Diesel Particulate Filter (DPF) as standard.

Driving excitement is assured by the high-performance 240 hp OPC model, the 147 kW/200 hp 2.0-liter turbocharged gasoline engine and the powerful 110 kW/150 hp 1.9 CDTI diesel unit with a maximum torque of 320 Nm.

The 1.8 ECOTEC engine debuting in the Zafira delivers sporty performance with moderate fuel consumption. With power output of 103 kW/140 hp, this unit is the first of a new generation of Opel engines and boasts continuously variable camshaft phasing.

The front-wheel drive new Zafira is available with a choice of five transmissions. Five of the seven engines come standard with a close-ratio six-speed manual transmission
(2.0 Turbo, 2.2 direct, all 1.9 CDTI). In addition, there is a manual five-speed transmission (1.6 TWINPORT, 1.8) and, as an option, a six-speed automatic transmission with a manual ActiveSelect shift function (available for 120 and 150 hp 1.9 CDTI models), a four-speed automatic (optional for 2.2 direct) and, from the spring of 2006, the further developed “Easytronic” automated five-speed manual transmission with additional sport mode, available for the 1.8 ECOTEC.

Dr. Peter Mertens, Vehicle Line Executive for compact cars, says: “The dynamics promised by the design of the new Zafira are realized with a broad range of powerful, modern, highly efficient powertrains. No other manufacturer offers such a variety in this segment.”

1.6 TWINPORT ECOTEC (77 kW/105 hp): Innovative entry-level technology

The entry-level gasoline engine is the 1.6-liter TWINPORT unit with 77 kW/105 hp and a maximum torque of 150 Nm. This four-cylinder ECOTEC engine boasts compact dimensions, low internal friction, and the innovative TWINPORT concept. This intelligent fuel-saving technology for four-valve gasoline engines with displacement up to 1.6 liters employs variable intake control via a throttle valve in one of the two inlet ports of each cylinder and uses high rates of exhaust gas recirculation to reduce fuel consumption by as much as 10 percent under typical everyday driving conditions. While up to 25 percent of the cylinder charge is supplied over an additional pipe from the exhaust side of the engine at partial load, power output and fuel efficiency at full load are retained – an important bonus for smaller engines, which naturally have to work hard more often. The Zafira 1.6 TWINPORT has a five-

speed manual transmission, a top speed of 176 km/h, accelerates from zero to 100 km/h in 14.3 seconds and has fuel consumption according to the MVEG test cycle of only 7.1 liters per 100 kilometers.

1.8 ECOTEC (103 kW/140 hp): Continuously variable camshaft phasing

The main advantages of the new 103 kW/140 hp 1.8-liter ECOTEC gasoline engine, newly developed down to the last detail compared to its same-size predecessor, are a performance increase up to 14 percent, approximately four percent lower fuel consumption and improved flexibility and refinement. The main key to these significant improvements is “CamPhase” continuously variable control of both camshafts. Depending on the speed and load range, either power or economy-optimized valve timing can be selected. An extremely compact, lightweight vane-type hydraulic adjuster rotates the camshafts directly to the ideal setting in relation to the crankshaft.

Other technical highlights of this engine, which will probably be chosen by the majority of Zafira buyers, are the synthetic a two-step intake manifold with a rotary sleeve instead of flaps to minimize flow losses; a highly efficient oil-water heat exchanger; a map-controlled thermostat; and a deep drawn exhaust manifold with an integrated catalytic converter. In accordance with the overall weight-saving design concept, the engine weighs three percent less than its predecessor with the same displacement. Including the bearing caps, the gray cast iron engine block tips the scales at only 27 kilograms.

With power output of more than 57 kW/78 hp per liter, the new 1.8 ECOTEC unit is among the leaders in this displacement category. An important feature for day-to-day driving is that 90 percent of the maximum torque of 175 Nm is available all the way from 2200 to 6200 rpm. This creates additional reserves of pulling power, for instance when overtaking, and makes the Zafira 1.8 a good sprinter. Only 11.5 seconds are needed to reach 100 km/h from a standing start, and the top speed is 197 km/h. The fuel consumption of the Zafira 1.8 according to the MVEG test cycle is only 7.6 liters per 100 km.

In addition to the five-speed manual transmission, the 1.8 ECOTEC Zafira will be available in the spring of 2006 with the Easytronic automated five-speed manual transmission. This also has a special Sport mode, which moves the shift points up to higher engine speeds.

2.2 DIRECT ECOTEC (110 kW/150 hp): Highly efficient use of fuel

The 2.2 DIRECT ECOTEC is the first Opel engine to have variable high-pressure direct fuel injection (up to 120 bar pressure). The cooler fuel-air mixture that results from internal mixture formation allows better performance. The compression ratio of 12.0:1 is high compared with an engine using intake-manifold fuel injection. When coupled with the precise six-speed manual transmission (four-speed automatic optional), the 2.2 DIRECT ECOTEC engine accelerates the Zafira from zero to 100 km/h in only 10.6 seconds and reaches a top speed of 200 km/h. The 110 kW/150 hp engine consumes only 8.2 liters of gasoline per 100 kilometers according to the MVEG test cycle; this is some six percent less than with a conventional engine. The pleasantly smooth-running direct-injection engine, with its two balancer shafts and dual-mass flywheel, develops higher peak torque of 215 Nm at 4000 rpm. A high-tech design, the all-aluminum engine has four valves per cylinder and variable intake control. Flaps in the two inlet ports for each cylinder vary the airflow according to the load on the engine. They intensify the swirl of the fuel in the combustion chamber so that the resulting mixture burns more efficiently. At part-load, high rates of exhaust gas recirculation keep fuel consumption low and minimize emissions.

2.0 Turbo ECOTEC (147 kW/200 hp): Smooth-running top performer

The current top-of-the-line engine has even more reserves of flexibility. The 147 kW/200 hp 2.0 Turbo ECOTEC has a maximum torque of 262 Nm at 4200 rpm (250 Nm thereof from 1950 to 5300 rpm). This is the key to its excellent pulling power over a very broad rev band. This top performer among the Zafira engines has a dual-mass flywheel and two counter-rotating balancer shafts, so that its smoothness matches that of a six-cylinder engine. The 2.0-liter engine has a compression ratio of 8.8:1, a water-cooled turbocharger, a computer-controlled waste gate, a bypass valve integrated into the turbo module and a six-speed manual transmission that weighs only 50 kilograms. With its sporty, close ratios, this adds to the powertrain’s spontaneous response and allows the driver to make full use of the electronic (drive-by-wire) gas pedal to extract power.

The Zafira 2.0 Turbo needs only 9.0 seconds to sprint from zero to 100 km/h and
9.8 seconds to accelerate from 80 to 120 km/h in fifth gear. The 225 km/h top speed is also impressive, thanks to the best aerodynamics in this class (drag coefficient c_D = 0.31).

Yet it is modest in its noise and exhaust emissions. Two oxygen sensors monitor the double catalytic converters in the exhaust system: a first-stage converter that lights off rapidly and a large-volume main converter. The exhaust gas recirculating system is electronically controlled. According to the MVEG test cycle, this four-cylinder engine with its sequential fuel injection consumes only 9.5 liters of gasoline per 100 kilometers.

1.9 CDTI ECOTEC: Three powerful diesels with latest common-rail technology

Three 1.9-liter turbocharged diesels from the ECOTEC program with common-rail direct injection are available for the second generation Zafira. All of them comply with the Euro 4 emissions standard and have a maintenance-free Diesel Particulate Filter (DPF) as standard. Standard equipment with all these diesel engines is a close-ratio six-speed manual transmission.

The Zafira entry-level diesel engine has a power output of 74 kW/100 hp and maximum torque of 260 Nm between 1700 and 2500 rpm. With its variable-geometry turbocharger, this unit accelerates the compact van from zero to 100 km/h in 14.1 seconds, and gives it a top speed of 174 km/h. It needs only 6.1 liters of fuel per 100 kilometers (MVEG test cycle).

The same low fuel consumption is boasted by the 88 kW/120 hp version, which has maximum torque of 280 Nm at engine speeds from 2000 to 2750 rpm. The 120 hp Zafira 1.9 CDTI reaches a top speed of 183 km/h and accelerates from zero to 100 km/h in
12.2 seconds.

The top-of-the-line engine in the Zafira diesel program is the 110 kW/150 hp 1.9 CDTI, which develops a maximum torque of 320 Nm between 2000 and 2750 rpm. The four-valve engine takes the Zafira to a top speed of 202 km/h and gives it a zero to 100 km/h sprint time of 10.4 seconds. Its flexibility is also outstanding: 80 to 120 km/h in fifth gear takes only 9.8 seconds, the same as the 200-hp turbocharged gasoline engine. Fuel consumption is only 6.2 liters per 100 kilometers.

Among the ECOTEC turbocharged diesel engine's technical highlights is second-generation common-rail multiple direct fuel injection ('multi-injection'). In addition to the high injection pressure of 1600 bar, it permits the individual injection strokes to be

precisely controlled, and atomizes the fuel more finely, so that exhaust emission levels, initial response and noise quality are improved. This engine family also has variable turbine geometry, charge air intercooling and a host of other technical refinements that underscore Opel's commitment to maximum performance and environmental protection. They include the electronically controlled throttle, pneumatic-action swirl flaps in the intake ports, precise control of the water-cooled exhaust gas recirculation system and a maintenance-free diesel particulate filter. This filter consists of a ceramic body perforated by microscopic channels. The soot particles collect on the surfaces of these channels, and pressure and temperature sensors identify when the filter needs to be cleaned. A controlled program of multiple fuel injections then starts, so that the exhaust gas temperature rises and the soot particles are completely burned off. This takes place regardless of the vehicle load and with no noticeable effects on driving behavior.

Close-ratio transmissions with high-power performance

All three 1.9 CDTI variants feature the six-speed manual transmission with up to 400 Nm. Close ratios make effective use of the high-tech diesel engines' performance and fuel-saving potential.

The same applies to the six-speed automatic transmission, optional with the two more powerful 1.9 CDTI engines. A special feature of this unit is the ActiveSelect function: the gear lever can be moved across to a second gate in which manual shifting is possible. In the fully automatic mode, the most suitable ratio is selected adaptively, according to prevailing driving conditions. The driver can also press a button to select the Sport mode, in which the shift points are moved up to higher engine-speeds for sportier driving. The transmission control system reacts in the opposite way when the winter program is activated to minimize the driving wheels' tendency to spin on slippery surfaces.

Production, service and economic efficiency

Reliable, Service-friendly and High Value Retention

- Around 400 million euros invested in facilities and staff training
- "Zero defects" principle also applied to production of new compact van generation
- Low running costs, high value retention
- Voluntary new car manufacturer's warranty for two full years

The continuing success of Opel's quality initiative of recent years has yet again been confirmed by the brand's excellent performance in rigorous endurance tests conducted by trade magazines and the upward trend in market analyses such as the J. D. Power Quality Report. Internal statistics also reflect these results: for example, the total number of warranty claims submitted to Opel has fallen every year since 1999. A further indicator of improved product quality is a significant increase in dealer satisfaction. According to the brand monitoring report from the Institute for Automotive Research at the University of Applied Sciences Nürtingen, which monitors dealer satisfaction, Opel was number one among German volume carmakers in 2005. Opel also excelled in a survey conducted by the Automotive Research Center at the University of Bamberg at the beginning of this year. The survey showed that Opel dealers in Germany ranked Opel's new vehicle quality an outstanding second out of 26 brands, placing it well ahead of all other German and European manufacturers.

The new Zafira will further strengthen this upward trend with its top quality, reliability and long life-cycle – features that the developers gave highest priority from day one. The product specifications for the new Zafira were based on the underlying principle of developing technology that the customer really needs and that works reliably. Opel/GM engineers cleverly used both proven and further optimized components to ensure high quality and attractive prices for buyers.

The engineers and designers paid particular attention to the car's "perceived quality". Materials to be used in the new Zafira, where they should be used and the methods of joining components together were decided very carefully. Then the designers finalized the details of their work to best correspond with these specifications.

Special attention was paid to central areas such as the driver-oriented cockpit and frequently used switches. Standardized test procedures were applied to make sure that each element satisfies the highest standards in terms of both looks and feel. It is only when the look and feel match to create a uniform impression that an authentic sense of quality is achieved.

The side air vents in the instrument panel supports are one example of the details optimized in the new Zafira. They are made from high-quality material, with only minimal gap widths to the surrounding area. Because the fins' center of rotation is well forward, close to where the air emerges, outlet jets function efficiently and also create visual harmony. When closed, they blend seamlessly into the smooth surface of the instrument panel. The central turn-and-press knob, with which the most important functions of the infotainment systems are selected, is easy to operate with great precision, another result of Opel's commitment to quality.

Around 400 million euros invested in production facilities and staff training

Series production of the new Zafira began on April 25, 2005 at Opel's Bochum plant. The second generation of the compact van comes from the same production line as the Astra station wagon, which has received much praise for its quality from customers and trade experts alike. To date, Opel has invested around 400 million euros in modernizing the production facilities in the Bochum plant, providing the workforce with thorough training, and further improving quality management, including effective application of the "zero defects" principle.

This quality initiative in the production process ensures that any defects which do occur can be eliminated directly at the workstation. The workforce has been trained not to accept defective items from the previous workstation, how to prevent defects themselves and not to pass on defective parts to the next station. An "andon" cord is installed at every workstation and can be pulled if a problem occurs that cannot be solved within the pre-defined work cycle time.

When an employee pulls the cord, an acoustic and light signal (andon = lamp) tells the team leader exactly where on the production line immediate assistance is required. If necessary, the line is halted temporarily until the error is remedied.

This ensures that only fault-free vehicles can move on to the next workstation and, ultimately, be delivered to customers.

Low operating costs, high value retention, two-year manufacturer's warranty

Long service intervals, low fuel consumption and low maintenance requirements minimize the running costs of the second Zafira generation. For example, all Zafiras with a gasoline or diesel engine need their first main inspection only after two years or 60,000 kilometers – whatever comes first – and an interim service after one year or 30,000 kilometers. Interim service includes oil change, a visual inspection and a new system inspection with a check of all electronically controlled systems, e.g. customers can have updated software installed. If, for instance, an optimized engine management system is developed and introduced in series-production vehicles, customers can have the new software version installed in their car, and are only charged for the labor costs. A large number of components are completely maintenance-free, such as the gasoline engines' fuel filter, as well as the belt drive of the auxiliaries and the battery. It is not necessary to change the coolant or transmission fluid, nor refill the air conditioning system during the entire life-cycle of the vehicle.

Also contributing to excellent value retention is extensive galvanization of the body. The anti-perforation warranty is valid for twelve years. In addition, while many other car manufacturers refer solely to the dealers' liability for defects, Opel offers its customers a two-year new car manufacturer's warranty in addition to the mandatory guarantee. This is an apparently minor difference with major significance, as the mandatory guarantee only makes the seller liable for defects that the vehicle had at the time of purchase. After six months, the customer must prove that the defects existed at the time the vehicle was purchased. In contrast, Opel's voluntary new car warranty entitles the customer to free-of-charge repair work (at all Opel service partners) for defects falling in the manufacturer's area of responsibility – regardless of the car's mileage and when the problem occurs within the two-year period.

The economic advantages of the Zafira are not, however, only in the long term. State-of-the-art ECOTEC engines ensure low fuel consumption and low running costs. The new entry-level 1.6 ECOTEC gasoline engine with fuel-saving TWINPORT technology delivers a five percent increase in output and fuel savings of three to five percent compared with the

previous unit. The new 1.8-liter gasoline engine with variable camshaft phasing is even more impressive. It has a power output fourteen percent higher than the previous engine, and at the same time consumes four percent less fuel. Very economical fuel consumption was also given highest priority when developing the three diesel engines, which all have highly efficient common-rail multiple direct injection in the new Zafira. In the standard test cycle, no engine consumes more than 6.2 liters per 100 kilometers. A further benefit for customers is that all three 1.9 CDTI engines comply with the Euro 4 emissions standard and are equipped with a maintenance-free diesel particulate filter as standard – a measure that not only improves exhaust emissions but also strongly influences value retention.

Repair-friendly design and innovative processes save money

Zafira owners benefit from repair-friendly design: low repair costs, less down time and in some cases more favorable insurance classes compared to the previous model. Service experts at Opel/GM ensure that as many components as possible are available individually, so that larger assemblies need not be replaced unnecessarily in the event of vehicle damage. This concept makes a difference even with minor damage that can occur when parking: the bumpers have protection guards that are available separately and can be replaced quickly thanks to their clip-on fittings. The headlamps are another example: broken mountings can easily be replaced because they are screwed on. After a frontal collision, the otherwise often intact lamp unit need not be completely replaced unnecessarily. The entire electrical system is just as easy to replace and customer-friendly - individual sections of the wiring harness can be replaced separately, as can plug housings and sensors.

An innovative replacement procedure, first introduced for the Opel Astra and now a feature of the new Zafira, makes the windshield and rear window easier, quicker and safer to replace. When removing the glass the service centers no longer use a knife, eliminating danger of damage to the paintwork. Instead the mechanics use an endless wire as a loop to cut through the adhesive seal. Thanks to a new adhesive used to fit the new windshield, the customer also benefits from a particularly short setting time of less than two

hours. And innovative repair methods developed by the Opel/GM Service Division reduce repair time, getting cars back to their owners more quickly.

Provision has also been made for fast, low-cost accident repairs. Bolted rather than welded joints in many places permit repairs at moderate cost. The front cross-member, a robust aluminum section, is bolted to the body with “crash boxes”. The three-part front panels enable section repairs to be carried out economically, while bolted-on hinges make it easier to replace the engine hood. Expensive components in the engine compartment are located away from the immediate crash-damage zone. In the event of a head-on collision, for example, an innovative mount slides the radiator backwards and out of harm’s way. At the rear, the strong frame side rails meet in flange plates made of high-strength bake-hardening steel. These support the energy-absorbing aluminum cross-members and can be replaced individually. The tailgate, tail lamps and exhaust tailpipe are all positioned so that in most cases they are outside the impact zone in a rear-end collision.

New Opel Zafira: Glossary of Technology and Innovations

AFL (Adaptive Forward Lighting)
Swiveling Bi-→Xenon headlights. In the Zafira, AFL consists of “dynamic curve light” and “adaptive highway light” functions. Depending on the steering wheel position and speed of travel, the headlamps swivel in the direction of the curve the car is travelling through. At higher speeds along a straight path, the low beam automatically raises its lighting angle to project longer beam distance, while a beam width regulator prevents the light from blinding oncoming traffic.

Active Head Restraints
This further improved safety feature reduces the risk of whiplash in the event of rear-end collisions. Upon impact the upper part of the body presses against the lever system in the seat back, which triggers both the head restraint and the upper section of the seat back to move up and forward. It thereby cushions the head earlier in its backward movement.

Active Carbon Filter
Part of the → Electronic Climate Control (ECC) system available with the Zafira. The filter works together with the →Air Quality Sensor (AQS) with automatic air circulation to ensure that no harmful fumes enter the Zafira interior.

Air Quality Sensor (AQS)
Part of the Zafira electronic climate control system (→ECC), this sensor detects - via chemical reactions on its surface - fuel vapors and automatically activates air circulation. Fresh air is added if the quality of the air inside the vehicle threatens to go below that of the air outside for any significant length of time.

Automatic Lighting Control (ALC)
In response to the readings received from two sensors in the front windshield, ALC automatically activates or deactivates the low beam headlamps. One sensor measures brightness in the immediate vicinity, while the other takes into account lighting conditions on the road just ahead of the car, thus

recognizing tunnels or bridges. Should both sensors register darkness (e.g. at night), the low beam headlamps are automatically switched on. If darkness is registered ahead of the car and brightness in the surrounding area (e.g. in a tunnel), the low beams are also activated. When both sensors detect brightness, the headlamps are switched off following a brief time lag. If the forward light

sensor measures brightness and the area sensor darkness, this indicates a bridge or underpass and the headlamps remain deactivated.

Auto Lock
Re-locks the car automatically after five minutes if the doors remain unlocked after closing and are not reopened within five minutes. This is a subfunction of the standard remote control central locking system featured in the new Zafira.

Brake Assist
This subfunction of the brake booster progressively generates the maximum braking pressure if the brake pedal is pressed particularly quickly, thus reducing the braking distance.

Cam-Phase / Continuous Variable Camshaft Phasing
A technical highlight of the new 103 kW/140 hp 1.8 ECOTEC gasoline engine: the unit has two continuously variable camshafts to optimize the charge cycle. Depending on the speed and load range of the four-valve unit, valve timing can be varied for optimal performance or consumption. The compact, hydraulic lightweight timing device in vane-type design rotates the camshafts in the proper direction to be optimally positioned to the crankshaft at all times.

CAN-Bus (Controller Area Network)
A network of numerous →Databus systems with various transmission speeds. This electronic architecture is a prerequisite for the innovative networking (→ICC) of the →IDS^{Plus} chassis' dynamic driving systems. The new Zafira makes use of three databuses (high, medium and low speed). The time-sensitive driving dynamic signals pass through the high-speed databus at a transmission rate of 500 kilobytes per second. This is eight times as fast as ISDN (64 kbyte/s).

Cellular Phone Console
Universal console including hands-free kit with telephone-specific adapter (available for most cellular phones), which connects the phone to the new Zafira's infotainment system (CD 30 upwards). The phone can thus be controlled via the → Steering Wheel Remote Control. Menu navigation and status display are shown on the graphic info display. Wireless Bluetooth technology and voice activation are available as an option.

Continuous Damping Control (CDC)
This innovative damping system is based on four dampers controlled by solenoid valves, which precisely and continuously adjust the dampers to ideally adapt to road conditions, vehicle movements and driving style. Together with other signals from the CAN-bus, numerous acceleration sensors deliver the signals required for optimal damping to the CDC regulator unit. This unit computes the damping level needed for each wheel in real time using mapping, with damper adjustment occurring within milliseconds. The result: the car remains stable, pitching motion during braking and car body movements in curves or on bumps are effectively reduced. CDC also increases the Zafira's agility and improves handling in borderline situations. CDC is an integral component of the high-tech →IDS^{Plus} chassis system.

Crashbox
This element is located between the bumper cross members and the body. Due to its design and construction, the crashbox has energy-absorbing deformation properties that prevent costly damage to supporting components in the event of mild collisions. The bolted-on crashboxes can be replaced easily and inexpensively.

Digital Audio Broadcasting (DAB) / Digital Radio
This digital transmission technology enables interference-free radio reception in CD quality, and displays information like song title and artist or traffic updates.

Databus
Various electrical and electronic components are connected by one common databus conductor. These series-connected modules are capable of recognizing commands specifically intended for them. Advantages: larger data volume, higher transmission speed, lower weight, greater reliability. (→CAN-Bus)

Deflation Detection System (DDS)
With the aid of signals from the ESP^{Plus} wheel speed sensors, a warning lamp is activated if tire pressure has been lost. The system detects a loss of pressure when a tire's rolling circumference decreases and causes its rpm to increase in relation to the other wheels. The DDS requires no additional wheel sensors and

supplements →TPMS when, for example, winter tires without corresponding sensors are fitted.

Double-DIN Format
The clearly arranged control panel for the audio and infotainment systems is twice as large as a standard-sized unit. Advantages: easy-to-operate controls and more space for the integration of additional equipment like telephones or CD changers.

Easytronic
Further developed automated five-speed manual transmission which comes standard in the new Zafira with →Hill Start Assist (HSA) and a sport mode suited to the driving enthusiast.

Electronic Climate Control (ECC)
The driver simply needs to set the desired temperature on this electronically regulated air conditioning system. The user-friendly system then automatically regulates air temperature, velocity and routing. Assisted by a mathematical model, information from numerous sensors and complex software, the high-capacity processor calculates interior temperature developments and reacts, for example with cooler air, before the temperature in the car actually changes. An →Air Quality Sensor (AQS) with automatic air circulation activation, together with an →active carbon filter, prevents harmful fumes from entering the Zafira's interior compartment.

Electro Hydraulic Power Steering (EHPS)
Energy-saving hydraulic pump activation by an electric motor on an as-needed basis. With all Zafira engines (except 1.6 TWINPORT) it is map-controlled, depending on speed and steering angle.

Electronic Stability Program (ESP^{Plus})
The latest generation driving stability system with selective brake application on several wheels.

Flex7 Seating System
The Opel Zafira's patented multi-variable seating system with unrivalled flexibility. Seven seats (2-3-2) standard with a third row which can be completely folded away. The number of seats can be varied from two to seven, without having to remove or cumbersomely stow away the seats. A front passenger seat with a foldable seat back is available as an option.

FlexOrganizer System
Clever cargo management system with various transport and storage elements. Comprised of two horizontal side rails both on the left and right side of the luggage compartment, which have adjustable mounting points to allow flexible attachment of various retaining straps, hooks, dividers and storage boxes.

Follow-me-home Function
Headlamps continue to shine for 30 seconds after the vehicle has been turned off and exited to provide illumination, for instance to the front door.

Global Positioning System (GPS)
Geostationary system of 29 active satellites at present. With the help of GPS, the navigation system determines the current location of the car and calculates the route to the destination based on a digital map. This map is either on a CD-ROM (CD 70 Navi) or DVD-ROM (DVD 90 Navi). To increase the accuracy and reliability of GPS positioning, an electronic compass is installed in the corresponding Opel infotainment systems (coupled navigation).

Head Curtain Airbags
These latest-generation head curtain airbags provide additional protection for passengers in the front and outer rear seats in the second row. They deploy within 25 to 30 milliseconds, forming a curtain along the inner side of the car. In the event of a side impact, they protect the heads of the passengers on that side and, at the same time, reduce the risk of injury from glass splinters.

Hill-Start-Assist (HSA)
This →ESP^{Plus}-based system eases starting the car on an uphill gradient by preventing the car from rolling backwards without use of the handbrake. After releasing the brake pedal, pressure in the system is maintained for 1.5 seconds, giving the driver enough time to select a gear and press the accelerator. As soon as the car moves forward, brake pressure is released. The same assistance is provided when backing up on a hill. Standard equipment in models with →Easytronic transmissions.

Hydroforming
Forming technology: production of tubular components made of steel using very high water pressure. Advantages: improvement in quality, reduction in

weight. Used in the Zafira in the front subframe.

Interactive Driving System (IDS)
New Zafira chassis system with further developed McPherson wishbone axle with suspension subframe in front. A patented torsion beam concept with a U-form double-wall profile is used in the rear. The IDS chassis in the Zafira includes ABS, brake assist, the Electronic Stability Program ESP^{Plus}, TC^{Plus} Traction Control and Cornering Brake Control CBC. The optional IDS sport chassis (not available with 1.6 TWINPORT) with →SportSwitch has sportier tuned front and rear axles.

IDS^{Plus} (Interactive Driving System)
High-tech chassis system with electronic damping control →CDC and networking of driving dynamics systems →ICC (Integrated Chassis Control) for optimal balance of driving comfort, dynamics and safety. The innovative networking via →CANbus consists of the sensors and control units of CDC, ESP^{Plus}, ABS and TC^{Plus} as well as of the engine and transmission.

Integrated Chassis Control (ICC)
Networking of all driving dynamic systems as an integral component of the →IDS^{Plus} chassis system.

Magnetarc Welding Technique
Patented method used to connect the axle and trailing arm of the Zafira's →torsion beam rear axle. The welding technique enables the use of various wall thicknesses for the torsion profile (stabilizing effect against side roll) and various angles in the profile cross section (control of self-steering effects).

McPherson Front Axle
The →IDS chassis system of the new Zafira includes refined McPherson wishbone front axle. The McPherson principle has a coil spring encircling the shock-absorber, allowing space-saving wheel control with low unsprung mass. The Zafira's front axle is attached to the underbody by a subframe manufactured with →Hydroforming.

MP3 player
MP3 stands for "Motion Pictures Experts Group Audio Layer 3", a process which permits the compressed storage of audio data without negatively affecting the sound. Thanks to the high level of compression, a full ten hours

of music instead of the usual 70 minutes can fit onto a CD-ROM. In the new Zafira, the following infotainment systems are MP3-compatible: CD 30 MP3, CD 50, CD 70 Navi and DVD 90 Navi.

“Muffin Tin” Design
The new Zafira´s engine hood is designed to comply with EU regulations on pedestrian protection, which will go into effect on October 1, 2005. A lean steel structure with a special configuration of circular cut-outs and recesses (muffin tin design) inforces the impact absorbing metal hood.

Nivomat / Automatic Levelling System
A spring/damping system which automatically lifts the rear of the car after a few meters to the same level as the front end. Driving comfort and safety are thus retained even with a car-trailer combination or when the car is fully loaded. The system uses energy produced from the relative movement between the axles and chassis construction, eliminating the need for an external energy source**.**

Open & Start
A keyless driving authorization system whereby doors and trunk can be opened by simply pulling a handle when the driver is carrying the electronic key. The car is locked by briefly touching the sensors in the door handle. The car can of course also be locked and unlocked by remote control. The engine is started by pressing a start/stop button in the cockpit next to the steering column.

Panorama Roof
State-of-the-art roof system for the Zafira with four large, dark-tinted glass panels and five different-sized compartments (approx. storage capacity 20 liters) integrated in the center roof console running down the entire length of the ceiling. With the help of a power-operated shading system, all four glass panels can be simultaneously covered by individual window shades.

Parkpilot
This parking aid employs ultrasonic sensors located in the Zafira’s bumpers to alert the driver with an audible warning signal if there is an object in the car’s path. The sensors send out and receive sound waves, calculate the distance to the object and then emit an acoustic warning signal if clearance falls below a predetermined distance. The system also automatically allows for a trailer hitch should one be mounted to the car. A highlight in this vehicle segment:

the Parkpilot also offers this function in the front end, which can be manually activated.

Pedal Release System (PRS)
The brake and clutch pedals automatically decouple from their mountings at a particular level of impact to protect the driver's feet and lower legs in the event of a frontal collision.

Quickheat
An innovative heating system in which an electric auxiliary heater prevents the windshield from fogging up and speeds up interior warming. It activates automatically when the "maximum heating" setting is selected due to low outside and engine coolant temperatures.

RDS radio (Radio Data System)
Radios equipped with this decoder receive digital information such as the name of the current program or traffic messages. All Zafira Infotainment systems come equipped with RDS.

SAFETEC Safety System
Comprehensive protection system in the new Zafira which consists of all active and passive safety features. The active side is based on the →IDS chassis with the Electronic Stability Program →ESP^{Plus}, Traction Control TC^{Plus}, Cornering Brake Control →CBC as well as ABS, → Brake Assist and four disk brakes. The foundation of the passive safety program consists of a high-strength safety body with crashboxes and three energy-absorbing load paths. Passenger protection is supplemented by a number of features, including decoupling safety pedals (→PRS), seven standard head restraints, →active head restraints in front, front airbags, →thorax-pelvis side airbags, →head curtain airbags in front and outer seats of the second row as well as three-point safety belts for all seats.

Seat Occupancy Detection
Prevents the front and side airbags from deploying on the passenger side when the seat is not occupied or when it contains a transponder-equipped child's seat.

SportSwitch
With the aid of the SportSwitch button in the center console the Zafira's driving characteristics with →IDS sport chassis and →IDS^{Plus} chassis system

can be selected individually. If the Sport mode is selected, accelerator pedal and steering response is more direct. In combination with automatic transmission and Easytronic, the shift points are set at higher rpm levels. The SportSwitch also enables the driver to deactivate ESP^{Plus}. With IDS^{Plus}, the electronic damper control →CDC is also adjusted.

The primary goal of the normal setting, which is activated each time the car is started, is to minimize vertical body movement for a smooth ride. In contrast, the Sport mode delivers maximum body stability, for which the CDC algorithm is switched to a second parameter set.

Steering Wheel Remote Control
Infotainment system and on-board computer functions can be operated comfortably and safely using buttons on the steering wheel. The new and very practical scroll button can be used to set volume levels or page through menus.

Tailored Blanks

Tailored sheet panels made of high-strength steel which have a thickness of between
0.75 and 1.5 millimeters. They enable high stability in high-strain areas of the vehicle without making the entire structure unnecessarily large and heavy. They are used mainly in the underbody of the new Zafira.

Thorax-Pelvis Side Airbags
Installed in the backs of the front seats, these voluminous and form-optimized side airbags with two air chambers protect both the upper body and the pelvic area.

Torsion Beam Rear Axle
Rear axle construction of Zafira →IDS chassis is further refined to combine the advantages of conventional twist-beam axles like minimal space requirements, low weight and high camber thrust rate with the ability to exactly tune to very specific requirements of various models within one car line (→“Magnetarc” welding technique).

Tire Pressure Monitoring System (TPMS)
TPMS employs special sensors at each tire valve to recognize deviations from the correct tire pressure. It activates an individual tire warning signal in the graphic or color-info-display at pressure losses from 0.3 bar. The display can show the pressure of all four tires to a precision of 0.1 bar.

Trailer Stability Program (TSP)
This driving dynamics system monitors the yaw movement of the car-trailer

combination. If a predetermined limit is exceeded, the throttle is closed and brakes applied until stability returns.

Twin Audio
Separate listening pleasure in the second row using headphones. Second row passengers can select CDs using a separate control unit while the driver and front seat passenger can listen to the radio, and vice versa. Available with all Zafira infotainment systems from CD 30 MP3 upwards.

TWINPORT
Intelligent fuel-saving technology from Opel for four-valve gasoline engines with displacements of up to 1.6 liters. It employs variable intake control via a throttle valve in one of the two intake ports for each cylinder and uses high rates of exhaust gas recirculation to reduce fuel consumption by as much as 10 percent under everyday driving conditions. At partial load up to 25 percent of the cylinder charge is made up of previously burnt exhaust gas which is delivered through an additional line, yet power generation and fuel efficiency remain unchanged and can even be improved at full load. In the new Zafira: 1.6 TWINPORT ECOTEC (77 kW/105 hp).

Understeer Control Logic (UCL)
If understeer occurs, road speed is first reduced by closing the throttle and then by braking the front wheels. When the ESP control range is reached, braking pressure decreases at the outer front wheel and simultaneously increases at the inner rear wheel until the car is back on track again.

Xenon Headlamps
Gas-discharge lamps: sparkover between two electrodes ionizes the inert gas xenon and lamps are illuminated by resulting flowing electrical current. Advantages: long service life, high light intensity and low packaging requirements. The bi-xenon headlamps in the Zafira are used in Adaptive Forward Lighting →AFL.