BMW ConnectedDrive.
Contents.

1. Successful networking for more convenience, infotainment and safety – innovations from BMW ConnectedDrive.

Three quarters of a century have elapsed between the unveiling of the first in-car radio at the Berliner Funkausstellung (Berlin Radio Exhibition) in 1932 and the innovations from BMW ConnectedDrive now available to customers. Over the latter half of this period, in particular, rapid progress has been made in the networking of the car with the world outside and the traffic on the road – progress which can be credited to a large extent to the innovative power of BMW engineers. The world's first on-board computer with outside temperature display in the 1980 BMW 7 Series and the factory-fit navigation system presented by BMW in 1994 – the first of its kind from a European carmaker – have been just two of the many milestones along the way.

Innovations for even more driving pleasure.
BMW ConnectedDrive comprises all the innovative products, services and technologies which link up the occupants of a car, the car itself and the world outside. This unique package of innovations delivers improved convenience, infotainment and safety – and in so doing enhances driving pleasure. The innovations include the camera-based traffic sign recognition system Speed Limit Info, a telephone information service with data transfer to the navigation system, a feature that imports routes into the navigation system via a mobile phone or USB connection, and the Emergency Call function, which helps to identify the precise location of the vehicle and allows the emergency services to be guided quickly to the scene of the accident.

One of the special attributes of BMW ConnectedDrive is providing the driver with suitably prepared information for an even more intense driving experience. The convenience, infotainment and safety systems on board a BMW therefore give occupants as many services as they need or desire at any particular time. However, the job of selecting each service and making use of it remains firmly with the driver; who is the focal point of the car and responsible for it. The innovations from BMW ConnectedDrive allow the driver to increase his skill, assurance and safety in all types of driving situations.

More convenience – the telephone information service.
In addition to accessing the complete business and personal telephone directory, over 200,000 points of interest from the Michelin Green Guide or MERIAN guide can be sent to the car via the telephone information service. It is also possible to call up the latest flight information, locate pharmacies on duty, cash

machines or golf courses. Additionally hotel rooms can be booked through the Hotel Reservation Service (HRS) and there are benefits of up to 30 per cent compared to booking online. Selecting the information service option in the menu connects the car's occupant(s) with the BMW call centre. At the same time, the car automatically relays its current position. The special feature of this service is that the addresses sourced by the call centre can be sent directly to the car and entered into the navigation system.

More infotainment in the future – the Concept BMW Application Store.
In addition to the innovative BMW ConnectedDrive features already offered, BMW regularly previews future developments. The Concept BMW Application Store, for example, is another innovative highlight of BMW ConnectedDrive. Customers have become used to personalising devices – e.g. mobile phones – according to their own particular needs. As part of its rigorous further development of automotive networking technology, BMW is the world's first vehicle manufacturer to present, through a concept study, the fundamental possibility of downloading and storing individual applications either from your car at any time while on the move or from your PC at home. Conceivable examples of this are – as in the showcase – MERIAN multimedia travel guides, Geowiki, games, web radio, podcasts, Facebook®, XING and Twitter®. In addition to this scope for individualisation, another stand-out feature of the visionary Concept BMW Application Store is the ability to transfer contact data such as addresses or telephone numbers to the navigation system or mobile phone at the touch of a button. The information is displayed in suitable adapted form by the vehicle's HMI (Human Machine Interface, i.e. its operating logic) and the application is enhanced by vehicle-related data, such as the car's position in the Twitter® application.

More safety – Emergency Call.
Rapid and targeted assistance is paramount in the event of an accident. With the Advanced eCall function of BMW ConnectedDrive, BMW is the world's first carmaker to ensure that the emergency services receive detailed information on the type of collision and likely injuries to occupants before arriving at the scene of the accident. This information allows them to prepare the appropriate medical care for those involved in the accident in advance. The data relayed to the BMW call centre also specifies the precise position of the car, its chassis number, vehicle type and colour, as well as the data gathered by sensors in the car.

2. Extended convenience – BMW ConnectedDrive.

The driving pleasure typical of BMW is not only about providing special moments on the road, but also about making the car comfortable to use at all times. On long-distance journeys, in particular, the innovative technical capabilities of BMW ConnectedDrive significantly relieve the stress on the driver, enhancing his feeling of assurance in dealing with various driving situations and increasing the perception of convenience as a whole behind the wheel.

Sought and found – the telephone information service.
BMW ConnectedDrive is a dynamic concept in every respect. The ongoing further development of services offers ever-increasing levels of mobile comfort and easy information access. The telephone information service is a good example. In addition to accessing the complete business and personal telephone directory, over 200,000 points of interest from the Michelin Green Guide or MERIAN guide can be sent to the car via the telephone information service. It is also possible to call up the latest flight information, locate pharmacies on duty, cash machines or golf courses. Additionally hotel rooms can be booked through the Hotel Reservation Service (HRS) and there are benefits of up to 30 per cent compared to booking online.

Selecting the Information Service option in the menu connects the car's occupant(s) with the BMW call centre. At the same time, the car automatically relays its current position. The special feature of this service is that the addresses sourced by the call centre can be sent directly to the car. Both contacting the call centre and the transfer of the car's position and requested addresses are free of charge as part of the BMW ConnectedDrive service, and this facility can be used as often as desired. The transferred data can be entered into the navigation system by simply pressing a button. This also applies to requested telephone numbers: by clicking on the number sent from the BMW call centre to the car, the driver can make the call from his own telephone.

At home any time, any place – Google Services.
Google Local Search allows you to seek out local information using a direct Internet link to the world's best-known online search engine from the comfort of your BMW. The location and destination of the car are identified automatically and the results in the vicinity displayed, complete with address, telephone numbers and the distance from the car. The results are also shown on a map

familiar from Google Maps on the Internet. Users can carry out a search through the Google Maps database, in a similar way to using a business directory. The results are then easily entered into the navigation system or telephone at the touch of a button. If a URL is provided as part of the search result, the website can be called up directly from the vehicle via the relevant link – provided the car is specified with the optionally available Internet function.

BMW ConnectedDrive customers can now also access additional information on a selected destination from Google Maps via the options menu of the navigation system. This includes all the up-to-date information which Google Maps provides on the Internet, such as pictures, ratings and opening times.

The My Info service from BMW ConnectedDrive allows complete address datasets and text messages to be transferred from a PC directly to the car via the BMW ConnectedDrive portal on the Internet. This can be carried out either by the driver himself or by an authorised third party. My Info expands to include the Send to Car facility, which allows the driver or authorised third party to search for addresses online using Google Maps and then send them directly into the car. The new HRS Send to Car service works in the same way. This function makes it possible to transfer the address dataset on a hotel room booked through the Hotel Reservation Service (HRS) from the user's own PC into the car. Both the address and telephone number can then be called up under the menu item My Info and, from there, can be entered directly into the navigation system or mobile phone.

Arriving more quickly and more relaxed – Traffic Info Plus.
With Traffic Info Plus (V-Info+), the driver receives information on the traffic situation and weather conditions on trunk roads that is more up-to-date, detailed and comprehensive than that available from conventional traffic reports. This service obtains the relevant traffic updates and information – such as automatically calculated tailback lengths and delay times – together with warnings of heavy rain or snow, and relays them to the navigation system, which then recommends diversions from the planned route. In addition, reports covering a radius of approximately 50 kilometres are also available on traffic problems close to the German border in Austria and Switzerland. The information is then transmitted to the car's navigation system by RDS-TMC radio stations using an encoded data channel.

The data for this service (TMCpro) is provided by Navteq Services and is based on their own exclusive data acquisition system for traffic delays. This information is collected primarily from more than 4,000 sensors on motorway bridges and some 5,500 contact loops embedded in the carriageway that register traffic flow and weather conditions along trunk roads in Germany. These provide an

extremely accurate picture of the traffic situation and hazards drivers are likely to encounter. The information obtained in this way is complemented by data from traffic information centres, updates from the highways departments and reports from the emergency services and police departments.

Plus, all BMW vehicles with BMW ConnectedDrive send out – subject to the consent of the driver – Floating Car Data (FCD) since September 2001. This means that BMW cars not only receive but also gather and relay traffic information while on the move. Currently, the position, direction of travel and road speed of the car are all transmitted – in complete anonymity, needless to say. The information permits reliable conclusions to be drawn on the current traffic situation, although the service is restricted to intersection-free motorways at present.

Traffic Info Plus (V-Info+) is currently only available in Germany.

BMW TeleServices – the security of being in good hands at all times.
With BMW TeleServices, a BMW knows if and when a service is due. The car passes on this information to the BMW Service Partner in good time via an Automatic BMW Teleservice Call. If the driver wishes to make direct contact with the BMW Service Partner, he can initiate a Manual BMW Teleservice Call from the car. And in the unlikely event of a breakdown, help is always at hand through the BMW Teleservices Diagnosis and Help – without having to bring the BMW into a workshop. The benefits of BMW TeleServices are now available in 19 countries worldwide.

Automatic BMW Teleservice Call – a BMW car knows when a specific service is due and contacts the BMW Service Partner.
This service is now available in ten European countries (Austria, Belgium, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Spain, Switzerland) as well as Canada, Kuwait, Malaysia, Russia, Singapore, the UAE and the USA. The Automatic BMW Teleservice Call allows customers to arrange a service quickly and conveniently without any extra effort. With the help of the onboard Condition Based Service (CBS), the car automatically ascertains what type of service is required and when. As soon as its sensors determine the need for a service involving fluids or wear components (such as engine oil or brake pads), the vehicle automatically places a BMW Teleservice call and the relevant data is sent to the BMW Service Partner looking after that particular customer. This allows the customer's chosen Service Partner to identify the car's service requirements and order any necessary parts in advance, so that they are at hand in time for the pre-arranged appointment. This minimises the time the vehicle needs to spend in the workshop.

The automatic transfer of data to the BMW Service Partner also means the driver does not have to keep an eye on when the next service is due. As soon as the car identifies the need for a service and registers this via the Automatic BMW Teleservice Call, the customer is notified by the BMW Service Partner and the two parties can arrange a convenient time to visit the workshop. The customer is also informed in advance of the amount of work required and how long it is likely to take. The workshop visit can therefore be fitted into the customer's schedule to ensure maximum convenience.

Advance planning of a service also allows greater scope for individual requirements. A one-to-one conversation enables the service adviser and customer to discuss the merits of replacing brake pads ahead of a lengthy holiday trip, for example. All the necessary information will already have been supplied via BMW TeleServices.

Manual BMW Teleservice Call – precise data for customised services.
The Manual BMW Teleservice Call provides the technical means for the driver to make direct contact with his BMW Service Partner from the car. This enables an individual service appointment to be made, for example for a tyre change. Model-specific accessories can also be quickly and conveniently selected in this way.

With a Manual BMW Teleservice Call, the BMW also transmits all the relevant vehicle information. When returning the customer's call, the BMW Service Partner has all the necessary details to be able to offer a service precisely tailored to the customer's car. This service is currently available in Canada, France, Italy, the Netherlands, Singapore, Switzerland and the USA.

BMW Teleservice Diagnosis incl. BMW Teleservice Help – quicker analysis and elimination of faults.
In the unlikely event of a breakdown, BMW TeleServices is optimally equipped to keep inconvenience to an absolute minimum. Drivers of all BMW models (except the BMW X3) delivered in Austria, Belgium, Canada, France, Germany, Italy, Kuwait, Luxembourg, Switzerland, the UK and the USA can contact BMW's breakdown assistance directly using the Roadside Assistance menu option.

In addition to establishing direct voice contact, the current position of the car is transmitted to the BMW breakdown assistance centre along with important vehicle data (e.g. tank contents, coolant temperature, outside temperature) and vehicle diagnosis data. If necessary, BMW breakdown experts can check the car's BMW Teleservice diagnosis data. As well as the CBS data, these include any possible error codes. This gives the BMW breakdown service a better chance of pinpointing the cause of a fault and initiating the relevant measures

to rectify it. On the basis of this information, the BMW specialist can decide whether the functioning of individual vehicle components can be restored using BMW Teleservice Help or whether to inform the Mobile Service.

The remote diagnosis and repair of a functional fault are carried out only with the consent of the driver after he has activated both the BMW Teleservice Diagnosis and the BMW Teleservice Help functions via the iDrive operating system in the car. The transmitted data are only recorded if the message "Accept BMW Teleservice Help?" in the Control Display is confirmed. Safety-related components are on principle excluded from troubleshooting via data transmission. Various comfort functions, on the other hand, can be reset ready for use by means of BMW Teleservice Help.

Unbeatable convenience – Remote Services.
You're standing next to your locked car, anxiously patting all your pockets in search of your key. In vain. Not that you have lost it or left it behind somewhere; it just happens to be in the shopping bag you've locked inside the boot. As a rule, the only option in such a situation is to call the breakdown service. However, with the introduction of BMW Remote Services, prompt and appropriate help is at hand thanks to a technology developed by the BMW Group. For BMW ConnectedDrive customers it is possible – anywhere in the world – to have their car unlocked or locked by a BMW call centre after providing proof of their identity. This can be done regardless of whether one is in the vicinity of the car or in another country. If you are unsure whether you actually did lock your car, all it takes is a phone call to the BMW call centre and a member of staff will secure the doors remotely, if required.

Another feature, exclusively available to the BMW 5 Series Gran Turismo and the BMW 7 Series, is Remote Climate Control. A quick phone call before starting out on your journey ensures a pleasant cabin temperature. But as the driver – and the call centre – won't necessarily know whether the car is parked in the shade or in direct sunlight, the vehicle itself measures the outdoor temperature and determines whether the car should be cooled by the ventilation system or, if an auxiliary heating system is available, should be warmed up.

Everything within view – Park Distance Control, rear view camera and Side View.
With optional Park Distance Control (PDC) from BMW ConnectedDrive, sensors determine the distance of the vehicle to any obstacles, while acoustic signals indicate the how much room there is to manoeuvre by bleeping more rapidly as the car gets closer to the obstacle.

To complement PDC, there is the option of a rear view camera. This video system facilitates parking and manoeuvring in tight spaces and low-visibility environments. The high-resolution images of the wide-angle rear view camera are shown in colour and corrected perspective on the Control Display. Interactive track lines, moreover, indicate the optimal steering angle and the tightest turning circle for parking. A special zoom mode highlights the position of the towbar to ease the process of backing up to a trailer coupling.

A further option is the innovative Side View system. This operates with two cameras integrated in the front wheel arches which allow for early monitoring of cross-traffic from the left and right. The images are relayed to the Control Display and offer not just extra convenience when manoeuvring, but also enable an advance overview of the traffic in front of the car especially when coming out of narrow or blind driveway or car park exits. Side View can be activated by a direct selection button in the centre console for rapid availability.

Smart and communicative – Text-to-Speech.
With the Text-to-Speech function, BMW ConnectedDrive customers are given the option of having news and RSS feeds read out to them, as well as weather reports from March 2010. This not only adds convenience to driving but enhances safety as well, since the driver's hands remain on the steering wheel at all times and the eyes are focused on the road ahead. This service is available for all models (except the BMW X3) delivered from September 2009 and featuring a navigation system.

Finding a free parking space every time – parking information.
With mobility services such as the car park search function, the BMW driver is not only guided to a car park or a parking space. The special feature of this service is that BMW Online also automatically displays the spaces that are vacant in the chosen car park at any given time. More than 820 car parks throughout Germany already provide such dynamic data. In addition, opening times, parking fees and a photo of the entrance are also provided.

What you need to know about your destination – country information.
The country information service of BMW ConnectedDrive provides traffic-related details on 44 European countries online in the car. Apart from the current speed limits and the main traffic regulations, the legal blood alcohol limit and general information relating to the country can be called up at any time. The country information service is also available to BMW ConnectedDrive customers via the navigation options menu.

All-round service – hotels and restaurants.
From the car, BMW ConnectedDrive customers can call up thumbnail descriptions of recommended hotels and restaurants based on the classifications in the MERIAN guide. This information can be acquired for the current location or destination, or for any other location. This web-based service finds hotels and restaurants and displays them according to price and amenities. Again, the relevant addresses can be transferred to the telephone or the navigation system.

Seek, and you shall find – Travel guide.
The Travel guide service allows you to search online for places of interest (Michelin Green Guides), events and national and international museums at any given location. The search results are displayed along with the address, telephone number, opening times and a description. This data can be easily transferred to the navigation system or mobile phone at the press of a button.

Rapid orientation – also by mobile phone.
With its Send to Phone service, BMW Online connects the car with your mobile phone as well. This allows for the current location of the car and the destination to be e-mailed to the mobile phone from the car. The relevant section of a road map can be called up by opening the e-mail on the mobile phone, helping the driver to find the way. The current position and the destination are marked on the map so that occupants can also reach their destination quickly on foot from the parked car.

3. Extended infotainment – BMW ConnectedDrive.

One of the special attributes of BMW ConnectedDrive is to provide the driver with suitably prepared information for an even more intense driving experience. Various innovations offered as part of BMW ConnectedDrive serve this purpose and may be used in combination with a BMW navigation system.

The future of infotainment from BMW ConnectedDrive – the Concept BMW Application Store.

The Concept BMW Application Store is another innovative highlight of BMW ConnectedDrive. Customers have become used to personalising devices – e.g. mobile phones – according to their own particular needs. As part of its rigorous further development of automotive networking technology, BMW is the world's first vehicle manufacturer to present the fundamental possibility of downloading and storing individual applications either from your car at any time while on the move or from your PC at home, through a concept study. Conceivable examples of this are – as in the showcase – multimedia travel guides from MERIAN, Geowiki, games, web radio, podcasts, Facebook®, XING and Twitter®. In addition to this scope for individualisation, another stand-out feature of the visionary Concept BMW Application Store is the ability to transfer contact data such as addresses or telephone numbers to the navigation system or mobile phone at the touch of a button. The information is displayed in suitable adapted form by the vehicle's HMI (Human Machine Interface), i.e. its operating logic. In practical terms, this means that, via the menu path "BMW Services", "Application Store", "On the road", customers can download digital travel information and tips from MERIAN (as audio guides in audio book quality or in picture and text form) on points of interest, hotels, restaurants and leisure/nightlife options, manage contacts on "social networks", and receive and compose tweets – all without leaving the car. Plus, the menu item "Entertainment" leads the user to options including podcasts and a "guess the origin of the licence plate" quiz. Applications from the Concept BMW Application Store of BMW ConnectedDrive draw on information from the vehicle. With the BMW applications for XING and Twitter®, for example, the car's position is taken from the navigation system and, if the system is actively guiding the car to a destination, information about the destination time and location are used. Beyond that, the future use of numerous other vehicle data for BMW applications is conceivable, e.g. acceleration or braking data.

In the future, vehicle occupants could be supplied with a constant stream of new and interesting applications to download from the visionary Concept BMW Application Store. It may also be possible to download software to the car at any time while on the move. In this way the vehicle would be kept up-to-date with the latest developments throughout its service life and customers would continue to benefit from the BMW Group's latest technical innovations after buying their car.

BMW Routes – fascination on the move.
A navigation system guides a BMW driver reliably from A to B, usually along the quickest route. But sometimes the journey is the goal. BMW is the first carmaker in the world to offer the option of creating your own routes with up to 30 stop-offs on the Internet portal at www.bmw.com/routes and then transfer them to the car. The navigation system then takes you precisely along the pre-planned and imported route to your destination.

Alternatively, BMW ConnectedDrive customers can let themselves be inspired by a choice of some 30 specially researched BMW Routes available on the Internet. Apart from fascinating driving experiences in Europe's most attractive regions, a new option also offers four Urban Routes (Amsterdam, Barcelona, Copenhagen, Zurich). A particular hotel is recommended for the start and destination, and each BMW Route also includes a golf course. Along the way there is ample time to take in recommended cultural or culinary experiences. But the focus of every BMW Route is the driving experience along an attractive route. Motorways and heavily used roads are avoided as far as possible, with well-developed and surfaced country roads and panoramic stretches being favoured.

BMW Routes enables all BMW drivers for the first time to use one of the innovative BMW ConnectedDrive services: every BMW owner with the Navigation system Professional (from 9/08) can import pre-planned routes into the navigation system via the USB interface.

With its wide-ranging possibilities, the BMW Routes service is a particularly attractive example of innovative infotainment options in which networking the vehicle with the outside world adds to the enhancement of the driving experience.

Surfing fun – the Internet.
BMW brings together the fascination of mobility and unlimited Internet use. As the world's first carmaker, BMW provides unrestricted access to the World Wide Web on the vehicle display. With this innovation,

BMW ConnectedDrive offers the driver and passengers the possibility of surfing the net while on the move. Any web page can be called up onto the central dashboard display, either by entering a URL address using the iDrive operating system or by selecting from a personalised favourites list. This system developed by BMW ConnectedDrive is the logical continuation of the intelligent networking of the driver, the vehicle and the environment.

During Internet use, the BMW iDrive Controller assumes the role of a conventional computer mouse. By pushing the Controller in different directions, the cursor can be moved around the web page shown on the display. Pressing the Controller is the equivalent of a mouse-click on a PC and allows links and menu items to be selected. Rotating the Controller allows you to scroll up and down the web page.

Data transfer is based on EDGE technology (Enhanced Data Rates for GSM Evolution) which, in contrast to UMTS, provides blanket coverage and is three to four times faster than the GPRS mobile communications standard. A special BMW server allows the rapid transfer of web pages into the car and their optimised display on the screen. It also ensures that Flash animations and other Applets with extremely high data volumes – which could inhibit high-speed transfer – are presented as effectively as possible. In this way, BMW ConnectedDrive guarantees improved data transfer to allow for comfortable in-car surfing.

With its Internet in the car offer, BMW once again assumes a pioneering role in the provision of online services in the car. In doing so, the world's biggest maker of premium cars once again demonstrates its expertise in the field of vehicle electronics.

Entertainment just like home – convenient integration solutions for mobile devices.

The range of integrated infotainment functions has long since turned BMW premium cars into "connected up vehicles". One of the major challenges is to connect the rapid succession of multimedia devices entering the market with the car in the most convenient way possible. If mobile devices are integrated into the car, they should allow for intuitive, distraction-free and ergonomic use through existing operating options in the vehicle. The applications and customer-specific data remain on the mobile end device, while operation and output are via the vehicle's HMI (Human Machine Interface, i.e. the operating logic). The advantages, beyond the convenience of the simple, seamless means of using the devices in the car, are enhanced safety and legal compliance. This

is already possible in vehicles from the BMW Group, for example playing music from the Apple iPod and other music players via the USB/audio interface, as well as wireless, hands-free use of mobile phones such as the iPhone via Bluetooth.

An optional snap-in adapter from the accessories range and a compatible USB ground plate create the possibility of fully integrating the latest smartphone models in BMW cars. The option of extended connection of the mobile phone music player enables the phone's communications and entertainment functions to be used and to be controlled via the iDrive operating system. Telephone numbers and music tracks that are stored in the smartphone are shown in the car's Control Display. Beyond that, the power supply of the smartphone and signal reception via the car aerial are also guaranteed.

Travel with your favourite music – Online update music tracks.
In conjunction with the new iDrive and the Navigation system Professional, BMW drivers can now transfer music files from a CD, MP3 player or USB stick onto the car's hard disk. These tracks are then available at all times, even if for example the CD is no longer in the car. BMW ConnectedDrive customers also have the possibility of going online to upload information on titles or artists for a previously scanned CD which are not yet available on the hard disk. This can be done free of charge via the SIM card embedded in the vehicle. As a result, BMW ConnectedDrive customers are always up-to-date.

The iDrive system allows the driver to access his personal music collection, a CD he's brought with him, an external player or the radio. The car's entertainment server has 12.5 GB storage capacity, equivalent to that of around 200 music CDs. The individual tracks, along with information on the artist and the track, are stored in the car's own database, making them easy to access through alphabetical lists in the audio system's iDrive menu.

Precipitation radar keeps BMW passengers away from the wet.
Sunshine and blue skies, yes please; showers and hailstones, no thanks. That's why surfers tune in to the coastal weather update, hang-gliders check the Internet and hikers hope for the best. But what about BMW drivers? They are the only motorists with a precipitation radar on board. After all, not everything that comes from on high is a blessing, as not only Convertible fans know. Heavy hailstorms with large stones, for example, can cause substantial damage – not just to the car. So it pays to be prepared in advance for what the weather may bring and to plan accordingly. BMW is the world's first car manufacturer to offer its customers the option of calling up graphics in the car that show the current precipitation conditions for any location in Germany. They have two zoom settings, are updated every 15 minutes, and show the geographic

distribution or rain, hail or snow. Using the menu option Precipitation radar, it is also possible to call up an animated representation of cloud movement over the last 90 minutes.

Customised weather report – snow or sun.
The latest weather report, including forecasts and iconised graphic representations, can be displayed from any desired location. Weather reporting, depending on the time of year, also includes the Convertible weather or Frost forecast services. In summer, the driver can ascertain whether he can drive with the top down the next day, and in winter whether the day will start off with scraping ice from the windscreen. Moreover, the latest snow depths for ski resorts in Austria, France, Germany, Italy and Switzerland – some with live images – can be called up directly into the car.

Office – with e-mail account and address book.
With BMW ConnectedDrive, passengers aboard a BMW need not worry about e-mail or personal address books. Using a dedicated BMW Online portal, e-mails can be received, read and answered directly from the car or via the Internet. Moreover, occupants have their comprehensive address book at their disposal in which they can store and update all their contacts. Existing addresses can be synchronised on the Internet or the BMW Online portal and called up in the car via the BMW Online portal.

Always up to the minute – news and stock prices.
The news menu of BMW ConnectedDrive includes the sections Top News, Germany News, World News, Business, Stock Market, Sports and Panorama, as well as My News. The latest news from around the world are supplied online directly by the Agence France-Presse (AFP) news agency. This has the major advantage that news reports are available in the BMW at the same time as they are sent by AFP to radio and newspaper offices. Moreover, the driver can call up the news that is of specific interest to him. BMW ConnectedDrive also provides information on the latest stock market prices in chart format. Beyond the regularly updated stock market developments, the driver can create a personal “watchlist” that collates the values of specific stocks or use the search function to check individual share prices. In addition, the driver can set up a personal news portal: in the BMW ConnectedDrive portal on the Internet, RSS feeds from any providers can be selected and stored under My News with an appropriate name. The brief information bulletins from the RSS feeds are then displayed in the vehicle.

4. Extended safety – BMW ConnectedDrive.

Supporting the driver as the situation demands can, moreover, be a factor in promoting active safety on the road. Appropriate systems help the driver in better assessing challenging situations and in avoiding potential hazards.

If the worst comes to the worst – Extended Emergency Call.
Rapid and targeted assistance is what counts in the event of an accident. With the Advanced eCall function of BMW ConnectedDrive, BMW is the first carmaker in the world to ensure that the emergency services are provided not only with details on the kind of collision but also on the potential injuries to occupants, before they arrive on the scene. Thanks to this information, the emergency services can prepare in advance the appropriate medical treatment of those involved in the accident. That is because the data relayed to the BMW call centre specifies the metre-precise position of the car, its chassis number, vehicle type and colour, as well as the data gathered by sensors in the car. All the restraint systems deployed in the car are registered along with the occupancy of the front seats and the status of the seat belts. This allows front, rear, side or even multiple collisions to be recognised and differentiated. Likewise, if the vehicle rolls over, this can be ascertained and reported in the same way.

In order to evaluate the vehicle data, the BMW accident research team collaborated with the William Lehman Injury Research Center (WLIRC) to develop a special algorithm. Based on this, the emergency services alerted by the BMW call centre know in advance where the accident has taken place and which vehicle is involved – and, thanks to the unique technology of the Extended Emergency Call, whether there is an increased risk of injury to occupants. That allows the relevant emergency measures to be prepared rapidly and appropriately. The vehicle itself relays its exact GPS position data along with the vehicle data, while help is summoned by the staff at the BMW call centre, which is staffed around the clock. They make telephone contact with the car's occupants, notify the nearest emergency control centre and use their psychological training to provide reassurance to the passengers.

There is the additional option of a conference call, which involves the BMW call centre creating a direct voice link between the vehicle's occupants and the emergency control centre. This direct, unmediated communication ensures that no information is lost. The automatic Emergency Call works even if there

is no external mobile phone available or if this is switched off, because data transmission for all services is via a separate telephone unit integrated in the car. Needless to say, the Emergency Call can also be actuated manually, for example to summon help for other road users as quickly as possible.

The BMW engineers have embarked on the development of an assistance system which, when it detects that the driver has a serious medical emergency, also automatically switches to an autonomous driving mode and carries out a safe emergency stop. In simple terms, the car switches on the hazard warning lights and carries out a controlled manoeuvre – taking into account the surrounding traffic – to the side of the road before coming to a halt. At the same time, an emergency call is sent out containing the relevant data to launch the necessary medical and traffic-related assistance measures. This enables the effective provision of emergency care tailored to the relevant situation.

The Emergency Stop Assistant is based on sensors that monitor the driver's vital data and on existing assistance systems of BMW ConnectedDrive. Assistance systems such as the Lane Change Warning System or Active Cruise Control with Stop & Go function constitute a further technological basis for developing the emergency stop system.

BMW first launched its emergency call function in the USA in 1997.
This life-saving feature has also been available in Germany since 1999.

BMW Night Vision with pedestrian recognition.
Assisting the driver in accordance with the situation is a key factor in promoting active safety on the road. Such systems help the driver to better assess challenging situations and to avoid potential hazards. BMW is the world's first carmaker to present a Night Vision system with pedestrian recognition and warning in the new BMW 7 Series. The new generation of BMW Night Vision sets standards in the field of accident avoidance when driving at night. The central element of the system is a thermal imaging camera which supplies a moving video image in which the driver can recognise people, animals and other heat-emitting objects even beyond the range of the headlight beam. This is then shown in high resolution on the central Information Display.

To this end, the video data of the long-distance infrared camera is analysed by an image processing system which uses intelligent algorithms to specifically search for pedestrians and cyclists that might cross the path of the car. If, and only if the system detects a potential danger to the persons, the driver is given a warning via the central Control Display and the optional Head-up Display. This alert only applies to pedestrians who are in a warning corridor dependent on speed, steering angle and yaw rate.

Everything in sight – Head-up Display.
When driving at 100 km/h, a glance at the speedometer equates to a road distance of 27.78 metres. That's 27.78 metres during which you take your eyes off the traffic, with potentially fatal results. This is where the optional Head-up Display comes to the rescue by projecting important data and instructions such as speed, navigation prompts or warnings directly into the windscreen so that the driver has them in his line of vision at all times. BMW was the first European carmaker to market this safety system.

Technically, the Head-up Display is based on an intense light source with which all the relevant data are projected onto the windscreen, in freely configurable form and in colour, from a TFT display with 65,000 pixels and using several mirrors. The mirrors, some of which are movable, not only compensate the curvature of the windscreen, but also take into account the individual seating position of the driver. The information can even be read in intense sunlight. A special brightness sensor, moreover, permanently monitors and adapts the luminosity so that the driver is not dazzled at night either.

The driver does not see the projected information directly on the surface of the windscreen, as when looking into a mirror, but around two metres distant, hovering above the bonnet. That way, important information can be quickly and accurately registered without the need to take one's eyes off the road.

Always right on track – Lane Change Warning, Lane Departure Warning and Speed Limit Display.
Maximum control and safety while driving is guaranteed by the Lane Change Warning System available from BMW ConnectedDrive. From a speed of approximately 50 km/h, radar sensors at the rear of the vehicle monitor the traffic situation in adjacent lanes. It covers an area extending from the blind spot in the next lane to a distance of approximately 60 metres to the rear. If vehicles are detected in the blind spot or are approaching from behind, this is indicated by a dimmed light on the foot of the exterior mirror housing (information level). At the warning level, the driver is alerted to a critical situation by an illuminated triangle symbol and a vibration in the steering wheel. This happens if he indicates the intention to change lanes by using the turn indicator and if there is a vehicle in the critical zone, to prevent him cutting into the path of the other vehicle.

Any unintentional straying from one's lane is picked up by the Lane Departure Warning System. This consists of a camera mounted on the windscreen in the vicinity of the rear-view mirror, a control unit for data comparison, and a signal generator that actuates the vibration of the steering wheel if corrective steering

action is deemed necessary. The camera tracks the lane markings on at least one side of the road and compares this information with the line being taken by the vehicle and the edge of the road. It can see for approximately 50 metres ahead and can also be used at night when the headlights are switched on.

In conjunction with the Navigation system Professional, the optional Speed Limit Display can be used to permanently inform the driver of the current permissible speed limit on any stretch of road. The camera installed in the vicinity of the rear-view mirror permanently registers the fixed signs at the roadside, as well as variable displays on motorway gantries. The data gleaned from registering these traffic signs is compared to the information stored in the navigation system, and the detected speed limit is then shown on the dashboard.

Optionally, the speed limit information can be shown in the Head-up Display. Unique in its range of functions, this display system supplies the driver with relevant data in his direct field of vision. The information and warnings are projected onto the windscreen, where they can be read without the driver taking his eyes off the traffic.

Active Cruise Control with Stop & Go function.
The optionally available Active Cruise Control with Stop & Go function comprises an automatic distance control which allows for comfortable cruising in flowing traffic on motorways and main roads. It also maintains an appropriate following distance at all times in stop-go traffic. Only if the car has been at a standstill for more than 3 seconds does the driver have to blip the throttle or press the Resume button on the multifunction steering wheel to move off again. This keeps the driver involved as an active element within the cycle of control and gives him ultimate responsibility. Even when the system is activated, the driver can adjust the speed at any time by accelerating or braking.

Active Cruise Control with Stop & Go function uses latest-generation radar sensors. If the distance to the car in front as set by the driver is reduced, the system adjusts the speed to the traffic situation by intervening in the engine management or the brake system. The maximum deceleration activated by Active Cruise Control with Stop & Go function is up to 4 m/s2. Should it be necessary for the driver to intervene if the vehicle in front brakes hard, he is prompted to do so by visual and acoustic signals. Simultaneously, the intervention thresholds of the Brake Assistant are lowered and the DSC system's brake standby function is activated.

5. BMW ConnectedDrive in the historical context.

The BMW Turbo presented back in 1972 was a test vehicle which, for the first time, took account of the car's external environment and in this way provided the occupants with additional important information – for example, by means of a radar-backed distance warning device. Today it is possible to surf the Internet in a BMW and, through targeted networking, utilise a virtually limitless range of information possibilities. To that extent, the ongoing development of the BMW ConnectedDrive convenience, infotainment and safety services always guarantees maximum comfort in terms of mobility and information.

As a pioneer in the field of vehicle electronics, BMW already began to interconnect information, communication and assistance systems inside and beyond the car in the early 1970s. In 1974, BMW was also the first European manufacturer, for example, to introduce the navigation system, giving the driver access to data from outside the car. This new communications level, alongside the development of sensor-controlled driver assistance systems like the Anti-lock Braking System (1979) or Dynamic Stability Control (1999), constitutes the basic technology of BMW ConnectedDrive.

Milestones of a technological innovation process.
For more than 100 years, drivers and their vehicles have been interacting by means of the classic speedometer and oil gauge. But BMW already took a decisive leap forward early on by linking the car to the outside world to create additional services and technologies that would assist the car's occupants. Here is an overview of the milestones in the history of BMW ConnectedDrive:

1977: Onboard computer with fuel consumption gauge introduced into the BMW 7 Series (E23).

1980: World's first onboard computer with external temperature display introduced into the BMW 745i. The driver is informed of the critical temperature if there is a threat of ice on the roads.

1984: Introduction of the service interval indicator. BMW dispenses with fixed maintenance intervals and replaces them with need-based service intervals depending on the relevant driving profile.

1986: The BMW 7 Series of the time (E32) is the first BMW to offer the option of a factory-fitted C-Net telephone.

1992: Europe's first Park Distance Control (PDC) system is offered in the BMW 7 Series. It uses ultrasound to check distances and is an example of the increased networking of the driver with the environment.

1994: In a further step towards connecting the driver to the outside world, BMW is the first European car manufacturer to present an integrated navigation system in the BMW 7 Series.

1997: Fast and targeted help – that's what counts in a traffic accident. BMW is the world's first carmaker to offer an emergency call function – first in the USA and, since 1999, in Germany as well. It means the car automatically alerts the BMW call centre in the event of an accident and at the same time transmits its exact GPS position data. The data sent to the BMW call centre now includes, in addition to the car's precise position, information gathered by sensors, for example in the airbag systems. This is analysed in less than a second to give an insight into the kind of collision and likely injuries. As a result, the emergency services alerted by the BMW call centre receive advance information about the car as well as where the accident has occurred and, thanks to a further developed emergency call system, whether there is an increased risk of serious injury among the occupants.

1999: With BMW Assist, BMW becomes the first European manufacturer to offer far-reaching safety and service features within an integrated system. The new telematics services comprise, among other things, an emergency service, real-time traffic information, today's Traffic Info Plus, as well as mobility-related information services. In the meantime, the telephone information service covers more than 35 million entries from the business and personal telephone directory. Supplementary information such as restaurant ratings, duty pharmacies, the latest flight information and the option of booking hotel rooms can be obtained via the information service. The special feature of this service is that the addresses sourced in this way can be sent directly to the car. The driver can simply enter all the transferred data into the navigation system by pressing a button.

2000: This year marks the birth of BMW ConnectedDrive as an overall concept pulling together all previous development strands and leading to a new dimension of networking. Moreover, in 2001 BMW integrates Internet-based services into the car for the first time. This facility and the associated technology have since been systematically advanced. Today, as well as the display of vacant

parking places, it is possible to receive and send e-mails as well as call up share prices and world, sports and business news. Plus, the latest weather report with specific Convertible weather forecasts and, for wintertime, reports on snow depths with live images can be called up directly from the car. Drivers can use Google Local Search in the same way they would a business directory to find local companies and enter them as navigation destinations.

2001: The first BMW model – the BMW 7 Series (E65) – to feature Condition Based Service (CBS). SMS alerts on service intervals based on the individual car (Teleservice Call) are included within the BMW ConnectedDrive services of BMW Assist.

2007: The second generation of BMW TeleServices is launched – additionally featuring BMW Teleservice Diagnosis and Help. At the same time, BMW TeleServices is for the first time IP-based, and no longer SMS-based, and available independently of BMW Assist.

2008: As the world's first carmaker, BMW enables unrestricted use of the Internet in the car with BMW ConnectedDrive. Internet access is available at attractive flat rate terms as a special option in conjunction with the Navigation system Professional. As with the Internet-based services of BMW Online, BMW once again takes on a pioneering role in the field of online services in the car.

6. Availability and technical requirements.

The following BMW ConnectedDrive services can be used when the special options BMW Assist and BMW Online are ordered: Extended Emergency Call, Remote Services, My Info, Send to Car functions, telephone information service and Traffic Info Plus, as well as address book, BMW Routes, stock market, e-mail account, Google Local Search, hotels and restaurants, Country information, news, Send to Phone, Online music title update, Parking information, Travel guide, Text-to-Speech, weather and precipitation radar. The individual products are subject to various technical prerequisites and availability, as outlined below.

BMW Assist*, with the exception of the Remote Services, is available for all BMW models in conjunction with Business mobile phone preparation with Bluetooth interface and Navigation system or radio Professional. Remote Services are available for all BMW models except the X3.
(*BMW Assist comprises the services Extended Emergency Call, Remote Services, My Info, Send to Car functions, telephone information service and Traffic Info Plus.)

BMW Online** is available for all BMW models except the X3 in conjunction with Business mobile phone preparation with Bluetooth interface and navigation system. The BMW Routes and Online update music tracks services are only offered in combination with the Navigation system Professional.
(**BMW Online comprises the services address book, BMW Routes, stock market, e-mail account, Google Local Search, hotels and restaurants, Country information, news, Send to Phone, Online update music tracks, Parking information, Travel guide, Text-to-Speech, weather and precipitation radar.)

BMW Assist and BMW Online are available in Austria, France, Germany, Italy, Kuwait, the UK and the United Arab Emirates. In the USA and Canada, only BMW Assist is available. (Details in the press release pertain to the offering in Germany. The portfolio varies in the above-mentioned countries in which BMW Assist and BMW Online are available.)

The Internet facility is available in Germany for all BMW models except the BMW X3. Further countries will gradually follow.

BMW TeleServices are available in Austria, Belgium, France, Germany, Greece, Italy, Kuwait, Luxembourg, the Netherlands, Singapore, Spain, Switzerland, the UK, the United Arab Emirates and the USA. BMW TeleServices are available for all new cars with the exception of the BMW X3. BMW TeleServices are offered independently of any existing BMW Assist contract and of the telephone unit integrated in the car with a separate BMW SIM card. This means that all mobile telephones approved by BMW can be used for the new BMW TeleServices. A further prerequisite is mobile phone preparation with Bluetooth interface, the Navigation system Business, Navigation system Professional or radio Professional in conjunction with an onboard monitor. On this basis, the new BMW TeleServices are offered as an extra, free-of-charge special option.

Convenience, infotainment and safety features without boundaries – the Cross Border Service.

The language-based services such as country-specific travel information and, above all, Emergency Call and telephone information service are available to BMW ConnectedDrive contract customers in their relevant home language in Andorra, Austria, Belgium, France, Germany, Italy, Liechtenstein, Luxembourg, the Netherlands, Spain, Switzerland and the UK. Internet-based services such as Google Local Search, hotel and restaurant information, weather report, Travel guide or the address of the nearest BMW dealer are available to BMW drivers in Austria, Belgium, France, Germany, Italy, the Netherlands, Spain, Switzerland and the UK in the usual functionality and, needless to say, in the relevant language. This Cross Border Service incurs no extra charge (such as roaming fees) to the customer and is being steadily expanded to further countries in Europe.