Sensing technology	lower range limit	max. Range	Vehicle-to-obstacle relative speed	Obstacle movement	Obstacle nature	Pedestrian object classification capability	HMI	Weather conditions
Radar	can be down to below 50cm (depends on Radar frequency, measurement principle and bandwidth used)	up to 100 m (SRR) up to 250m (LRR)	not limited	Stationary and moving	any detection range depends on radar reflectivity (i.e. RCS)	limited		All. Reduced max. distance in heavy rain/snow. Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor.
Infrared fixed-beam Lidar	can be down to below 1m (depends on measurement principle and bandwidth used)	20m	0-30	Stationary and moving	any detection range depends on IR reflectibility (i.e. brightness) of the object surface	limited		All. Significantly reduced distance in heavy rain, snow, fog. Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor.
Infrared Flash Lidar (Long Range)	can be down to below 1m (depends on measurement principle and bandwidth used)	up to 200m	not limited	Stationary and moving	any detection range depends on IR reflectibility (i.e. brightness) of the object surface	limited		All. Significantly reduction of range in heavy spray and fog conditions. Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor.
Camera	depends on optics design (focus distance based on system requirements); - for front camera typ. 1m (hood length); - for 360° camera similar; can be lower or higher	50-200m (depends on desired object type and camera resolution)	depends on object distance	Stationary and moving	any detection range depends on background contrast and brightness of the object surface	yes	HMI is independent of sensor type.	All. Significantly reduced distance in heavy rain, snow, fog. Significantly reduced performance in night scenarios depending on ambient lighting and whether or not obstacle is lit by the vehicle. Blinding by sunlight (specifically in early morning / late evening) or by 3rd party vehicle headlights possible. Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor.
Passive (Far-) Infrared Camera	depends on optics design (focus distance based on system requirements); - for front camera installed at hood heights typ. 1m (limited by vertical FoV), - for installation above VRU (e.g. for truck or bus) could be less	100-400m (depends on desired object type and camera resolution)	depends on object distance	Stationary and moving	any Moving living objects provide unique thermal signature, which can be used for classification. (stationary objects also, but less reliable) The heat signature of a VRU is most reliable in close proximity to sensor (also in adverse weather)	yes		All. Completely independent of lighting influence (not affected by blinding and illumination) Reduced range with ambient temperatures between 30°-35°. Reduced range in heavy rain /snow / fog Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor.
Active (Near-) Infrared Camera	depends on optics design (focus distance based on system requirements); for front camera typ. 1m (hood length),	50-200m (depends on desired object type and camera resolution)	depends on object distance	Stationary and moving	any detection range depends on background contrast and brightness of the object surface	yes		All. Significantly reduced distance in heavy rain, snow, fog. Performance optimized for night scenarios. Blinding by 3rd party vehicle NIR headlights possible. Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor.
Stereo Camera	depends on optics design (focus distance based on system requirements); for front camera typ. 1m (hood length), for 360° camera similar; can be lower or higher	50-200m (depends on desired object type and camera resolution)	depends on object distance	Stationary and moving	any detection range depends on background contrast and brightness of the object surface	yes		Impacted by all of the same problems as all other optical sensors in rain, snow, fog, poorly lit conditions.However the range measurement capability of a stereo camera can be used to more readily combine (fuse) radar and camera image data.
Ultrasonic	typical 10-30cm (no physical boundary, but question of application)	5-6 m (depends on object size and surface)	Typically up to 10-:-15 kph (depends on obstacle)	Stationary and moving	In principle any. Best for surface with good reflectivity for ultrasound.	limited		In principle all. Limitations for heavy snowfall and ice on the sensors (Sensor blockage possible by e.g. mud/snow, but self-diagnosed by the sensor). Temperature, air pressure and humidity have to be considered.
Sensor Fusion	depends on which is fused with which.	depends on which is fused with which.	depends on which is fused with which.	depends on which is fused with which.	depends on which is fused with which.	depends on which is fused with which.		depends on which is fused with which.