



The Important (and Overlooked) Components for Vehicle Visibility and Safety

This white paper will cover:

- » **How poor visibility contributes to traffic accidents**
- » **Key differences between the types of wiper blades**
- » **Key differences between the most common types of headlights**
- » **Benefits of all-in-one windshield wash**
- » **Good maintenance practices for wipers, lights and windshield wash**



INTRODUCTION

Safety is the most important consideration for drivers on the road – and for good reason.

According to 2022 data from the National Highway Traffic Safety Administration (NHTSA), [more than 40,000 people died in traffic crashes last year](#). Although slightly down from the year prior, the ongoing traffic safety crisis is evident – especially when driving at night.

[The Department of Transportation](#) and [National Safety Council](#) report some significant traffic accident data as it relates to the elements and poor visibility.

While the majority of driving is done during the day, no automotive or heavy-duty driver can avoid the roadways after dark. And nobody has control over the weather. However, there are some actions drivers can take to improve their safety on the road.

This starts with understanding the critical (but often overlooked) safety components like high-performing wiper blades, bright vehicle lighting and quality windshield wash.

Nighttime driving and adverse weather conditions like rain and snow are among the leading causes of traffic accidents each year.

75%

of weather-related accidents occur on wet pavement

47%

of accidents happen during precipitation

50%

of traffic-related deaths happen at night

WIPER BLADES

Like most automotive and heavy-duty vehicle parts, wiper blade technology and engineering have evolved greatly since they were first introduced more than 100 years ago.

Although their main purpose – keeping the windshield clear – hasn't changed, today's wipers are designed for improved durability and maximized visibility in any weather.

For many automotive owners and heavy-duty operators, wiper blades are often an afterthought – a part only to replace long after its useful life. But modern wiper blades and driving trends have changed all that, and it's more important than ever to stay on top of maintenance.

This further emphasizes the role wiper blades [play in vehicle safety](#).



WIPER BLADE TYPES

Among those advancements are the advent of multiple wiper blade types.

While conventional wiper blades are common and economical, beam and hybrid blades have significantly improved durability and performance in bad weather.

Optimum wiper blades for both passenger vehicles and heavy-duty trucks should depend on the weather, roadway conditions and overall time on the road. For those who don't drive too often, or live in a dry climate, conventional blades are a suitable choice. But for people who spend significant amounts of time driving, or encounter varying precipitation, a more advanced wiper blade is a better option.

Many wiper blades are constructed with high-quality natural or synthetic rubber. But some of today's advanced beam and hybrid wipers are made with silicone compounds and other additives, such as talcum coatings, for added durability and streak reduction.



CONVENTIONAL WIPER BLADES used to be the most commonly used type of wiper. They are more straight shaped because they were originally designed to match the flatter windshields on older vehicles. These economical blades are typically made of a high-quality rubber with 6 to 8 contact points on the windshield.



BEAM WIPER BLADES are a step up in engineering from both conventional and hybrid wipers. Beam blades have a curved design with infinite contact points that match the contour of modern, curved windshields. This provides the wiper with consistent pressure on the windshield for a stronger, clearer wipe. They also typically last longer than conventional and hybrid wipers.



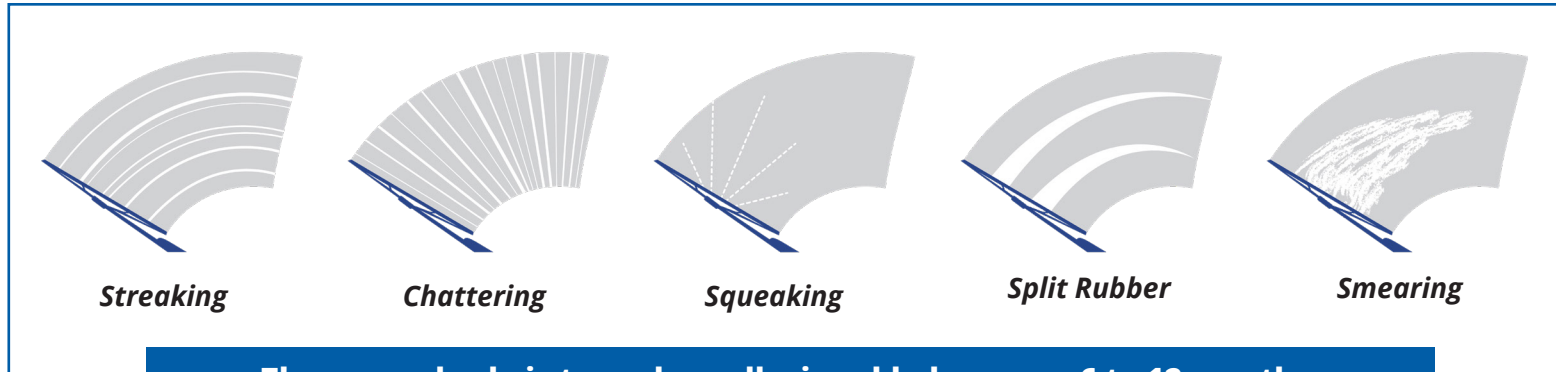
HYBRID WIPER BLADES combine the sturdy frame and balance of conventional with the sleek design and pressure points of beam blades. Hybrid style wipers are multi-weather blades with an aerodynamic spoiler that provide more precise contact points and long-lasting durability.



REAR WIPER BLADES shouldn't be overlooked. The rear windshield wiper is available in conventional, beam or integral style - which have a connection to match the vehicle's OEM wiper arm. The rear wiper blade should follow the same replacement practices as the front wipers.

WINDSHIELD WIPER BLADE MAINTENANCE

Like other essential vehicle components such as coolant, oil and tires, both front and rear wiper blades have their own maintenance intervals. All wiper blades will wear out and lose their effectiveness over time, so if telltale signs are present like chattering, squeaking, skipping or leaving streaks, then replacement is necessary.



The general rule is to replace all wiper blades every 6 to 12 months.

While wiper blade replacement once or twice a year is the accepted guideline, it varies based on the type of blades that are installed, how often the vehicle is on the road and weather conditions. Even in mostly dry areas, the wipers can dry out and become cracked and brittle. It is important to replace all wiper blades at the same time for even wear, optimal performance and better visibility.

What causes wiper blades to wear out?

- Frequent use
- Improper fit
- Lack of maintenance
- Heat and UV rays from the sun
- Freezing temperatures
- Snow and ice accumulation

While some wiper blade material like silicone may last longer, the conditions wipers are exposed to will eventually cause the material to break down, dry out or crack.

Having Trouble Installing Wiper Blades?

Changing out wiper blades may seem somewhat challenging at first glance, but once you learn about the wiper arm connections, they can be swapped out rather quickly. For those who may be stuck, many websites provide [helpful installation videos](#) and most auto parts stores provide free installation services as well.



Scan to visit
OWI's DIY Hub




VEHICLE LIGHTING

Proper vehicle lighting is just as important as quality wiper blades and they should be maintained accordingly.

Traditional headlights, even with the high beams engaged, only provide 400-500 feet of sufficient illumination. This distance is significantly less with the low beams on, or during nighttime driving through rain or snow. This makes bright, long-lasting headlights and taillights a [critical safety component](#) in both passenger and heavy-duty vehicles – for both the driver and other vehicles on the road.

Taillights and back-up lights are equally important so that drivers can clearly see vehicles in front of them braking or reversing, which is a critical safety consideration. Brake lights are designed to come on when the brake pedal is engaged, but as incandescent bulbs wear out, it may cause a delay in the brake lights coming on, in addition to being dim. **This is one key reason that LED bulbs are ideal for brake lights, because they are fully powered immediately.**

Brighter backup lights also assist drivers who have a backup camera installed. This helps to illuminate the space behind the vehicle in low light conditions for safer maneuvering while reversing or parking.

A close-up, low-angle shot of a car's front end, focusing on the headlight and grille area. The car is dark-colored, possibly black or dark blue, and the surface is wet with water droplets. The headlight is illuminated, showing a bright white light. The background is dark with some blurred lights, suggesting a nighttime setting. A red-bordered text box is overlaid on the lower right portion of the image.

When it comes to brightness, a bulb's lumens – a measurement of the visible light – indicate its strength. More lumens = the brighter the bulb.

VEHICLE LIGHTING TYPES

The most common types of headlight bulbs include:

HALOGEN - The most common type of headlight on the road today. Halogen bulbs are essentially incandescent bulbs with better luminosity. They are inexpensive, easy to install, and emit a warm yellow light with about 700-1,000 lumens on average. There are also several premium halogen headlights available with even higher luminosity and easy DIY installation.

LED - The longest-lasting type of headlight bulb. LEDs are energy efficient, emitting a bright white light for both automotive and heavy-duty applications. These lights don't need heat like incandescent bulbs to produce light, so they can reach full illumination faster. But according to DOT regulations, aftermarket LED lights cannot be used as headlights in on-road vehicles, only for fog lamps. LED headlights can be used for off-road applications. Miniature LED lights have no regulations for use.

Most newer vehicles come with LED headlamp assemblies from the factory – which are perfectly fine to use and are rated anywhere from 4,000-12,000 lumens. Additionally, LED bulbs can be used in other areas of the vehicle's interior, such as the dome lights, mirror lights, map lights, inside door lights and even the dashboard.

HID/XENON - High Intensity Discharge (HID) or Xenon lights are much brighter, longer-lasting lights than halogens. They emit a strong white light at about 3,000 lumens, but they aren't drop-in replacements; they require a conversion kit to run and can be more expensive.

LASER - The newest development in automotive lighting, laser headlights are nearly 4 times as bright as LED lights, with the longest range of illumination than any other headlight bulb.

How Long Do Vehicle Lights Last?

Maintenance on headlights, taillights, turn signals and back-up lights depends on the type of bulb used and how often it's lit (i.e., during nighttime driving or precipitation), but there are some guidelines:



HALOGEN:

5-6 years or
450-1,000 hours



LED:

10-12 years or
50,000-100,000 hours



HID/XENON:

10 years or
2,000-8,000 hours



LASER:

5 years or
10,000-50,000 hours

It is important to replace both headlight and taillight bulbs at the same time, so that they wear evenly and provide consistent illumination.

For both automotive and heavy-duty vehicles, it is a good practice to replace the bulbs before the typical lifespan elapses to ensure the strongest possible lighting power at all times.

*Scan here to find the right type of bulbs
for your vehicle.*



WINDSHIELD WASH

Keeping the windshield clear sounds like a no-brainer, but visibility issues can occur even without rain or snow.

Substances that intensify sun glare through the windshield:

- ✓ Dust
- ✓ Road Salt
- ✓ Oil
- ✓ Tree Sap

Other viewing obstructions:

- ✓ Grimy Glass
- ✓ Oncoming Headlights
- ✓ Dead Bugs
- ✓ Fingerprints and Smears

With so many potential factors that can reduce visibility, windshield wash is an important safety component. But depending on how often it is used, refilling is rarely considered until the fluid is empty – and there is even less consideration on which type of wash to use.

Standard windshield washer fluid is usually blue and made with a simple formula of water, methanol and another type of alcohol, like ethylene glycol. The purpose of methanol is to keep the wash from freezing and glycol is used to further reduce the freeze point when needed.

Other, different colored premium formulas are made for specific applications:



Bug removal

This wash contains strong cleaning additives that remove bugs, tree sap and other sticky substances that smear and obstruct driver vision. It's often formulated for temperatures above freezing, so it's not recommended for use during winter or in cold climates.



De-icer

The higher methanol in this formula helps melt snow and ice. It also cleans the windshield without freezing, making it the optimal choice for winter. Some formulations also act to prevent re-freeze for future drives.



All-season

As the name suggests, a premium fluid like [PEAK® All-In-One](#) windshield wash contains the features of all types, for consistent year-round use in all types of weather.

WINDSHIELD WASH

Washer fluid maintenance is simple, but there are a couple important guidelines to be aware of.

- 1.** It is a good practice to check and fill the washer fluid reservoir at least once per month – instead of waiting until it's empty – especially if driving in areas with bad weather or bugs.
- 2.** In colder climates, only fill the reservoir with washer fluid that resists freezing. The freeze point is usually indicated on the front label of the bottle. Using a washer fluid with a freeze point above 32 degrees in a cold climate risks freezing the wash lines and cracking the reservoir.

While there are several types of window wash on the market, a premixed, all-in-one formula is the easiest for drivers to maintain. This premium fluid eliminates the need to change the wash for different conditions.

A quality all-in-one wash is a wise choice for both passenger and heavy-duty vehicles because it acts as a de-icer and cleans obstructive substances in all driving conditions:



Snow, ice
and frost



Road salt
and dirt



Oil
smudges



Bugs and
tree sap



SUMMARY

- » Rain, snow and night driving are leading causes of vehicle crashes.
- » Wipers, lights and windshield wash play a major role in safety on the road.
- » Wiper blades should be replaced at least once per year.
- » When changing wiper blades, replace all blades at the same time.
- » When changing headlights or taillights, replace both sides at the same time.
- » Premixed, year-round windshield wash is the most effective for all driving conditions.



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