

Utah Highway Patrol – Window Tint Information Sheet

The tinting of automotive glass reduces the amount of light that can be transmitted or seen through it. (This measurement is referred to as "Visible Light Transmission" or "VLT".) Although this reduction of VLT may be negligible on a bright sunny day, low light conditions such as during night driving and inclement weather present inherent safety concerns. The driver's ability to detect an object depends upon the contrast available (ratio of the brightness of the object versus the brightness of the background). As the amount of visible light is reduced due to tint, the "contrast sensitivity" of the human eye is dramatically reduced, significantly impairing the driver's ability to recognize the presence of that object.

Diminished vision from inside out:

- Driving on intersecting streets requires drivers to be alert to the presence of pedestrians, cyclists, and other potential hazards. This is especially true as a driver prepares to turn left or right at an intersection, as these hazards are perpendicular to the windshield. Reduced VLT significantly reduces contrast sensitivity and therefore safety in general.
- Simple lane changes and merging require a driver to identify hazards to their right and left. In low light conditions, even a full size vehicle could be difficult to identify, especially if it's lights are not in operation.

Diminished vision from outside in:

- Eye Contact: As drivers interact with pedestrians, cyclists, and other vehicles, eye contact becomes visual communication subconsciously used in order to establish acknowledgement of one another's presence and recognition of one another's intentions. Research suggests that eye contact may occur as often as once per minute on a busy street.
- Law Enforcement Safety: Officers are required to make split second decisions based on rapid observations. The ability to accurately make the best decision is significantly diminished by both a lack of contrast sensitivity and increased reflective properties of aftermarket tint. This presents unnecessary risks to both the officer and the public.

Diminished vision through other vehicles:

Intersections with multiple lanes traveling in the same direction present an easy example in which drivers are required to look through an adjacent vehicle to identify objects perpendicular. These include cross traffic, pedestrians, and cyclists. This is especially detrimental to vision acuity as this circumstance will likely require the driver to look through two or potentially three tinted windows. If all three were tinted at 35% VLT, the resulting transmittance would be 12% or 4% respectively.

Limitations of the Human Eye:

With windshield VLT at 70% in Utah, drivers eyes would be forced to "Dark Adapt" (Phrase from NHTSA study) This occurs as the drivers eyes quickly pan from a brighter 70% VLT of the windshield to a 35% or lower VLT as they assess hazards in blindspots or cross traffic. This adaptation of the pupil takes precious time that may not be available.

Contrast sensitivity diminishes with age. A study at California State University indicated that 37% tint did not significantly reduce contrast sensitivity in young drivers, however, older drivers exhibited a significant reduction in contrast sensitivity at the same VLT. All drivers visual acuity in the study were negatively affected at 18% tint. A change to 35% tint in Utah could have detrimental effects to drivers of advanced age.

Clear tint with UVA and UVB blocking capabilities:

Proponents of window tint suggest that dark tint is necessary to the safety of the occupants with skin or eye conditions. However, there are many manufacturers of clear window tint which block up to 99% of all UVA and UVB rays without impeding visible light (VLT). Quality sunglasses can also mitigate photosensitivity and be removed when necessary.

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participants, of whom 10 were age 20 to 29 years and 10

were age 60 to 69 years, through a stock automobile window (control) and two

windows darkened with plastic film. For the younger drivers, a car window with

37% transmittance did not significantly reduce contrast sensitivity, but a darker

tint of 18% transmittance reduced contrast sensitivity at higher spatial frequencies. For the older

drivers, a tint of 37% transmittance significantly reduced mid to high spatial frequency contrast

sensitivity. The typical state standard (no tint

with less than 35% transmittance) would thus seem to be appropriate for

younger drivers; however, further examination of the standard may be necessary

in regard to older drivers. Actual or potential applications of this research include

guidelines and regulations regarding tinting of automobile windows.

OFFICER SAFETY

Two unscientific tests conducted by Virginia State Police and Maine State Police (FROM NHTSA):

Two police departments offered test results to support their opinions that 35 percent

transmittance tinting film was a threat to their safety. The Virginia State Police performed a

test in which 111 police officers were asked to look for unconcealed dangerous or evidentiary

items in a car equipped with 35 % film on the rear and rear side windows. The items were: a

green plastic bag, a white plastic bag, a slim jim, cocaine straws, a machine gun, glass

cutters, a knife, a blackjack, a pistol, a license plate and a crow bar. Only 41 percent of the

. officers were able to find at least half of. the items. Eighty two percent of the officers were

able to find at least half the items in a car without tint film.

The Maine State Police performed a demonstration experiment for their state legislative

committee which was considering a law to permit the use of 35 percent transmittance tinting

film. A plain clothes officer with a drawn service weapon held in a shadow was seated in the

rear of a 1988 Chevrolet Caprice with 35 percent film. Members of the state legislature

were asked to approach the vehicle. None was able to see the gun even on a bright sunny

day. The experiment was rePeated with 50% film and adequate visibility was reported. The

state legislature passed a law approving 50 percent light transmittance tint film.

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Crash Statistics:

State laws regarding tint vary from no tint (or 70% VLT) to the allowance of as dark as 20% VLT on front side windows. Observation of the various states overall fatality rates, pedestrian fatality rates, and bicyclist fatality rates provides no clear or obvious evidence of a link between the aforementioned fatality rates and tint laws. (See next page) Other studies also mention the lack of empirical evidence between crash/fatality rates and tint.

INFO GATHERED BY CPT WILLMORE:

*fatal information consists of averages of 2013, 2014, and 2015 per 100 million VMT

Utah and Surrounding States

	All Traffic Deaths	Pedestrian Deaths	Bicyclist Deaths
Utah 43%	.8959	.1378	.0238
Arizona 33%	1.3380	.2528	.0467
Colorado 27%	1.0363	.1236	.0239
Idaho 35%	1.2624	.0738	.0102
Nevada 35%	1.1637	.2820	.0329
New Mexico 20%	1.2778	.2312	.0205
Wyoming 28%	1.3468	.0494	.0176

No Tint or 70% VLT

Alaska	New Hampshire	Vermont
California	New Jersey	
Delaware	New York	
Iowa	Pennsylvania	
Michigan	Rhode Island	

All Traffic Deaths:	.9654
Pedestrian Deaths:	.1748
Bicyclist Deaths:	.0233

50% VLT

Minnesota
North Dakota
Ohio
Virginia
Wisconsin

All Traffic Deaths:	.9459
Pedestrian Deaths:	.0759
Bicyclist Deaths:	.0150

43% or 40% VLT

Utah

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Louisiana

All Traffic Deaths: 1.2091
Pedestrian Deaths: .1782
Bicyclist Deaths: .0331

35%, 33%, or 32% VLT

Connecticut	Kentucky	North Carolina	Tennessee
Hawaii	Massachusetts	Nebraska	West Virginia
Idaho	Maine	Nevada	Arizona
Illinois	Maryland	Oregon	Alabama
Kansas	Missouri	South Dakota	Georgia

All Traffic Deaths: 1.1403
Pedestrian Deaths: .1453
Bicyclist Deaths: .0168

30%, 28%, or 27% VLT

Indiana	South Carolina
Florida	
Mississippi	
Wyoming	
Colorado	

All Traffic Deaths: 1.3319
Pedestrian Deaths: .1576
Bicyclist Deaths: .0287

25%, 24%, or 20% VLT

Arkansas	New Mexico
Oklahoma	
Texas	
Montana	
Washington	

All Traffic Deaths: 1.3586
Pedestrian Deaths: .1582
Bicyclist Deaths: .0166

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MISC ADDITIONAL INFO:

It does not appear that the number 35 or 43 have any discernable origin, other than a common tint percentage used across the industry. The only studies that mentioned testing directly related to 35% are below. Both generally indicated that young drivers had negligible visual impairment near 35%, but advanced aged drivers were visually impaired by as little as 63% and significantly impaired at 35% (Cited in one page document) Darker levels of tint affect all ages.

Effects of car window tinting on visual performance: a comparison of elderly and young drivers

NICHOLAS R. BURNS

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Abstract

A major concern in allowing the tinting of car front side windows to 35% visible light transmittance (VLT) is that tasks performed through these windows often require the rapid detection of low-contrast, unilluminated targets. If the tinting interferes with detection of targets then road safety may be compromised. Speed of cognitive and visual processing declines with age; performance on backward pattern masking tasks can indicate this slowing in processing speed. Two experiments compared performance of the young and elderly adult on two backward pattern masking tasks with levels of VLT from 100 to 20%. The first experiment found a decrement in performance for the elderly at 63% VLT and for all participants at 20% VLT. The second experiment found a decrement in performance for the elderly at 35% VLT. It was concluded that road safety may be compromised if the front side windows of cars are tinted to 35% VLT.

Reference

26 references included

Effect of Aftermarket Automobile Window Tinting Films on

Driver Vision

James LaMotte, William Ridder III, and Karen Yeung, Southern California College of

Optometry, Fullerton, California, and Paul De Land, California State University,

Fullerton, California. This study was conducted to determine the level of automobile window tint that causes a significant reduction of vision for automobile drivers. Contrast sensitivity was measured on 20