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AVAILABILITY AND IMPLEMENTATION TRENDS OF DAYTIME RUNNING LIGHTS IN THE U.S.

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16. Abstract

This report documents market-weighted trends in the availability of daytime running lights (DRLs) on the best-selling vehicle models in the U.S. for model years 2000, 2004, and 2007. Also presented are analyses of how DRLs are implemented on current vehicles.

The availability of DRLs as standard equipment in our samples has increased from 29% in 2000 to 46% in 2007. The current availability depends on vehicle type. For example, there are still few vans equipped with DRLs (13%), but they have become a common feature on passenger cars (61%). For vehicles with DRLs as standard equipment, low-beam headlamps are the most common type of implementation (39%); in terms of trends by vehicle type, passenger cars most frequently use reduced-intensity high-beam headlamps (55%).

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Contents

Introduction

Daytime running lights (DRLs) are currently mandatory in 27 countries including those that require DRLs only during a specific time of year and/or on specific types of roads (GTB, 2007; luces24horas, 2007). Several recent publications provide general reviews of the benefits of DRLs and the issues related to the use of DRLs (Elvik, Christensen, and Olsen, 2003; Koornstra, Bijleveld, and Hagenzieker, 1997; Rumar, 2003; TNO, 2003).

Though DRLs are not required in the U.S., several manufacturers began introducing them as standard or optional equipment in the mid 1990s. Studies conducted to examine the effectiveness of DRLs on daytime collisions in the U.S. have shown a general benefit in terms of crash reduction (Farmer and Williams, 2002; NHTSA, 2000, 2004; Thompson, 2003). This crash reduction applies not only to vehicle-to-vehicle collisions, but also to collisions involving other road users (e.g., pedestrians). Consequently, it is likely that the number of DRL-equipped vehicles in the U.S. will continue to increase.

Understanding the current state of daytime running lights in the U.S. is important to evaluating current and future DRL influences on traffic safety. In this study, we surveyed the frequency and implementation types of DRLs in the U.S. The report documents market-weighted information on DRLs for model years 2000, 2004, and 2007.

Approach

Table 1 describes the three samples used in these analyses. We obtained the information for the top 20 best-selling vehicles for model years 2000 and 2004, and for the top 50 best-selling vehicles for model year 2007. The information that was collected was market-weighted by the respective sales figures for each individual vehicle (Automotive News, 2001, 2004, 2007). For the complete listings of the vehicles included in the samples, see Appendices A through C.

Table 1
Summary of the lamp samples.

Model year	Number of unique vehicles	Market-weighted percentage of all vehicles sold
2000	20	39.3
2004	20	38.8
2007	50	58.6

For the 2007 model year sample, a visual and physical inspection was made of each vehicle while on the lot at local dealerships in Ann Arbor, MI. For the 2004 and 2000 model year samples, the relevant information was obtained through the Internet. In case of uncertainty, the vehicle manufacturer was contacted directly. If more than one DRL alternative was offered for a vehicle, the base-model alternative was documented.

Results

DRL availability

The availability of DRLs in each sample is shown in Table 2, and in graphical form in Figure 1. The frequency of DRLs as standard equipment increased from 29% in 2000 to 46% in 2007. Vehicles for which DRLs are not available either as standard or optional equipment have decreased from 65% in 2000 to 39% in 2007. DRL-equipped vehicles in general (either as standard or optional equipment) have increased from 35% in 2000 to 61% in 2007.

Table 2
DRL availability within each sample. The entries in each cell are sales-weighted percentages. Bold numbers indicate the highest value in each column.

DRL function	Model year		
	2000	2004	2007
Standard equipment	28.9	39.2	**45.8**
Optional equipment*	6.2	0.0	15.2
Not available	**64.9**	**60.8**	39.0

* Cases with DRLs optional only for fleets were treated as *Not available*.

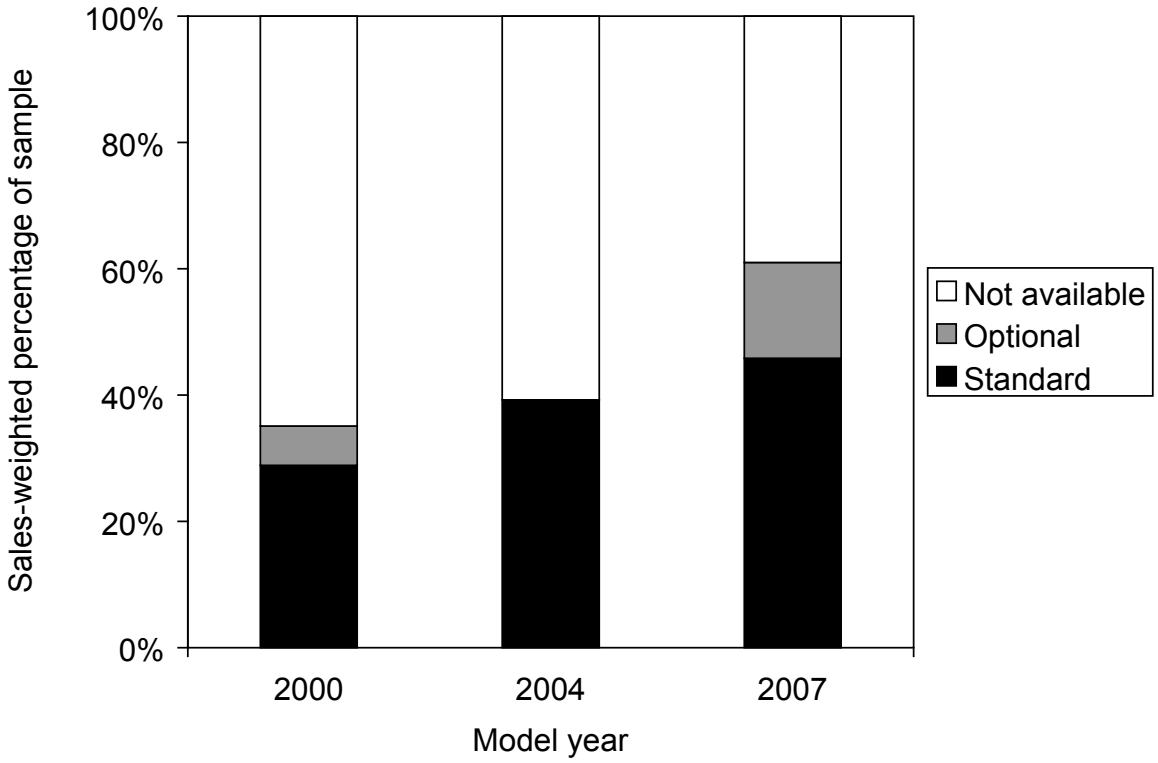

Figure 1. Sales-weighted distribution of DRL availability within each sample.

DRL availability by vehicle type

The DRL availability by vehicle type within each sample is summarized in Tables 3 through 5, and in Figures 2 through 4.

In the 2000 sample, about a third of passenger cars and pickup trucks and a fifth of SUVs were equipped with DRLs as standard equipment. Including optional equipment, passenger cars equipped with DRLs comprised nearly 50% of that sample. There were no DRL-equipped vans.

By 2004, DRLs installed in SUVs as standard equipment increased to 38%, while their availability on passenger cars remained near 50%. As with the 2000 sample, DRLs were not employed among vans in the 2004 sample.

DRL-equipped vans appeared in the 2007 sample (standard equipment: 13%, not available: 71%). In the 2007 sample, there is a shift toward DRLs as a standard function, especially for passenger cars (standard equipment: 61%, not available: 26%).

Table 3
DRL availability by vehicle type in the 2000 sample. The entries in each cell are sales-weighted percentages. Bold numbers indicate the highest value in each column.

DRL function	Vehicle type			
	Passenger car	Pickup	SUV	Van
Standard equipment	32.8	35.0	19.6	
Optional equipment*	15.6			
Not available	**51.6**	**65.0**	**80.4**	**100.0**

* Cases with DRLs optional only for fleets were treated as *Not available*.

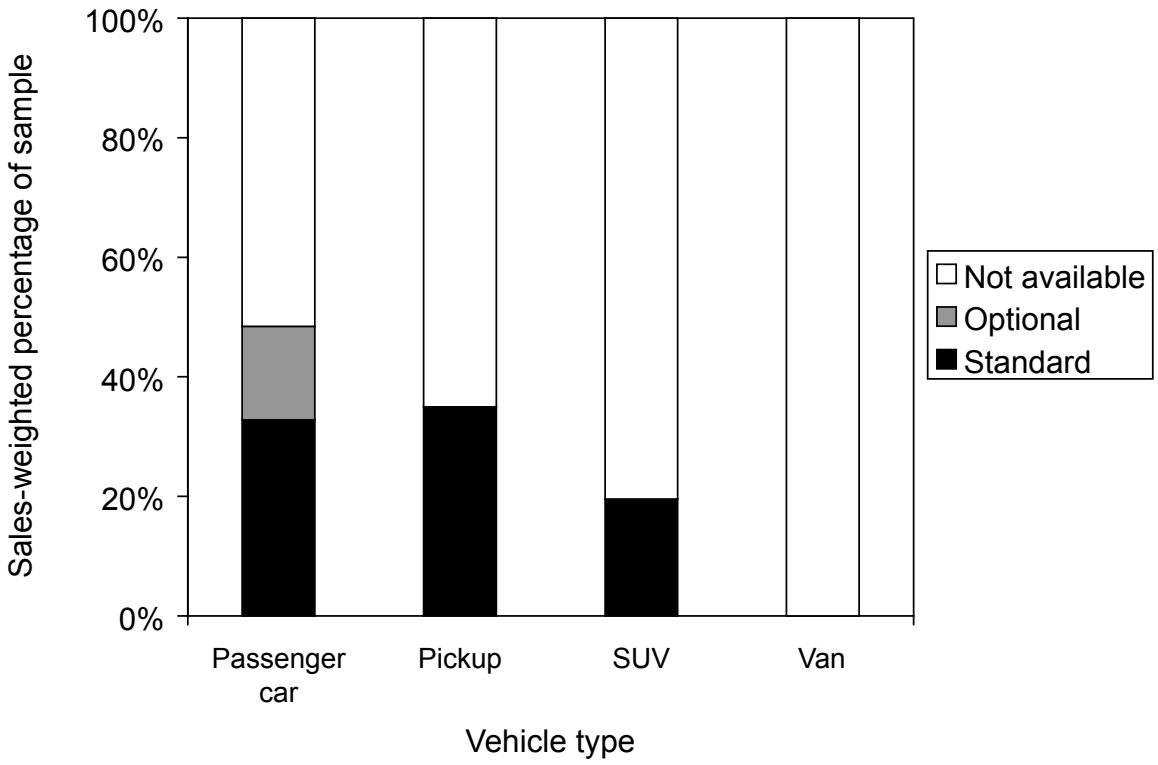

Figure 2. Sales-weighted distribution of DRL availability by vehicle type in the 2000 sample.

Table 4
DRL availability by vehicle type in the 2004 sample. The entries in each cell are sales-weighted percentages. Bold numbers indicate the highest value in each column.

DRL function	Vehicle type			
	Passenger car	Pickup	SUV	Van
Standard equipment	45.6	36.9	37.7	
Optional equipment*				
Not available	**54.4**	**63.1**	**62.3**	**100.0**

* Cases with DRLs optional only for fleets were treated as *Not available*.

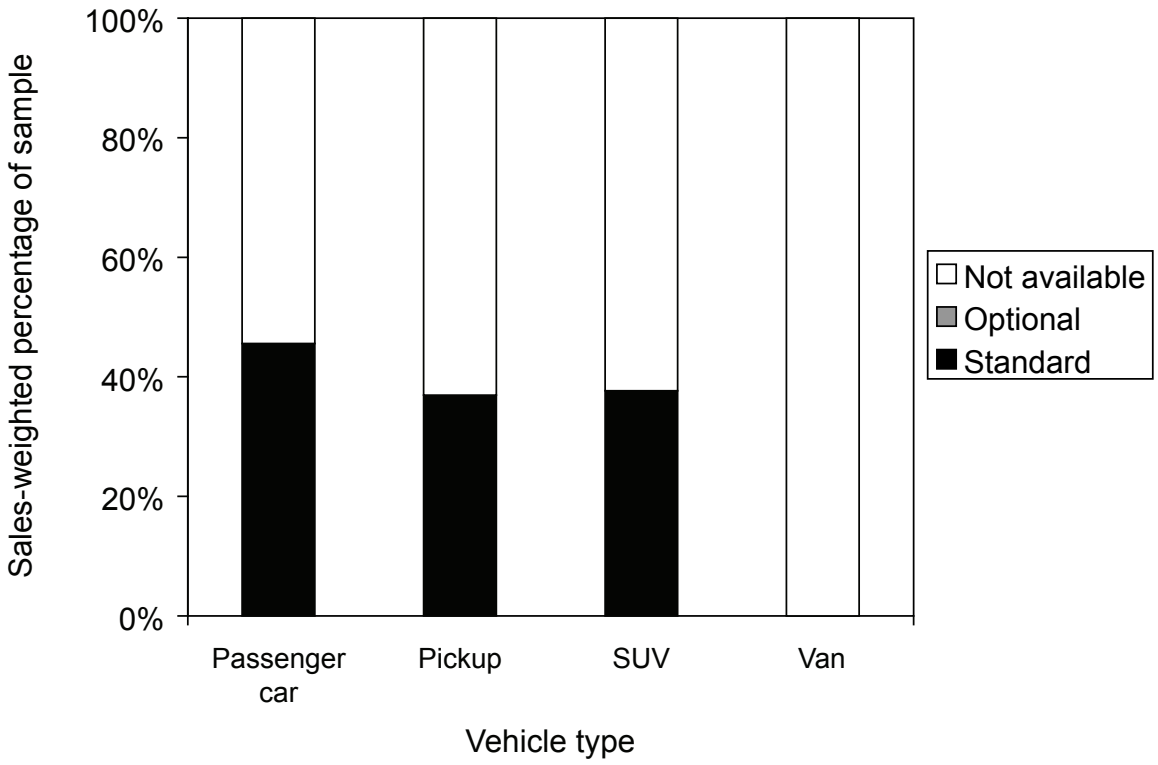

Figure 3. Sales-weighted distribution of DRL availability by vehicle type in the 2004 sample.

Table 5
DRL availability by vehicle type in the 2007 sample. The entries in each cell are sales-weighted percentages. Bold numbers indicate the highest value in each column.

DRL function	Vehicle type			
	Passenger car	Pickup	SUV	Van
Standard equipment	**60.6**	36.7	**38.9**	12.5
Optional equipment*	13.7	13.1	20.5	16.6
Not available	25.7	**50.2**	40.6	**70.9**

* Cases with DRLs optional only for fleets were treated as *Not available*.

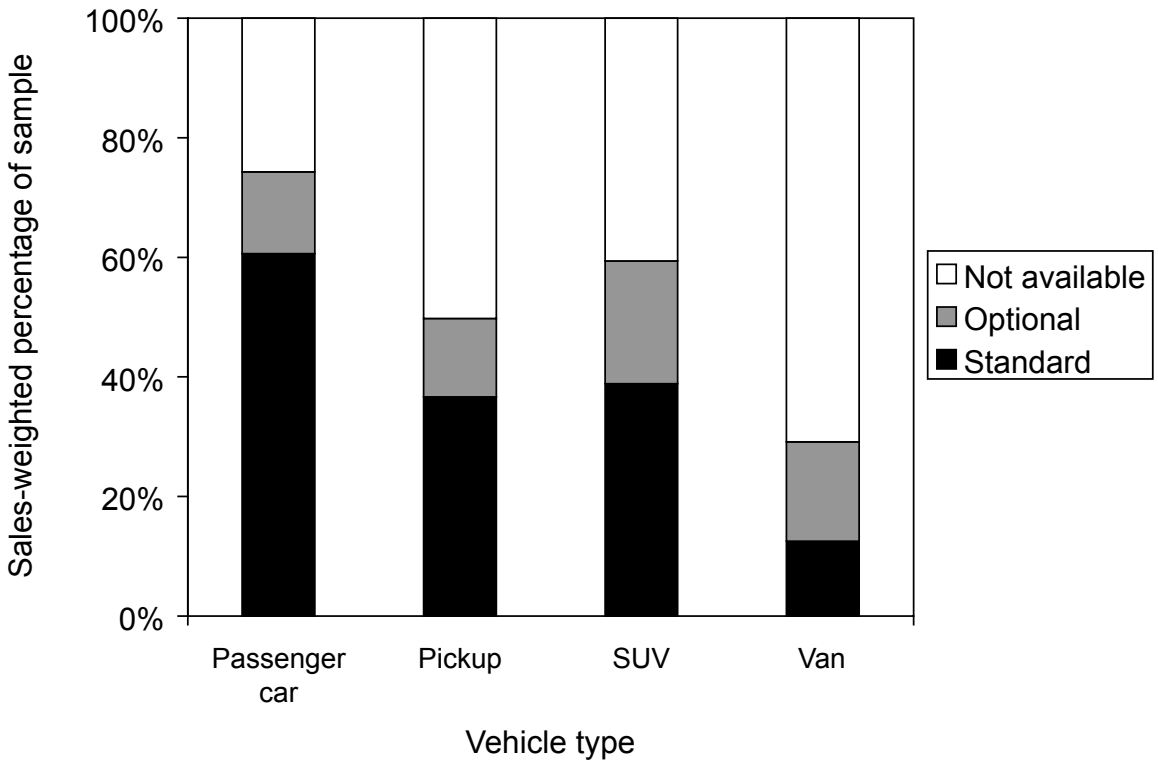

Figure 4. Sales-weighted distribution of DRL availability by vehicle type in the 2007 sample.

DRL configurations in the 2007 sample

The following lamps are in use for DRLs in the 2007 sample:

- dedicated DRLs
- low-beam headlamps
- reduced-intensity high-beam headlamps
- turn-signal lamps

The distribution of DRL types employed as standard equipment is summarized in Table 6 and in Figure 5. DRLs combined with other lighting functions are much more common (96%) than dedicated DRLs (4%). Low-beam and reduced-intensity high-beam headlamps for DRL usage are most preferred (39% and 36%, respectively).

Table 6
DRL types used as standard equipment in the 2007 sample.
Bold numbers indicate the highest value in the column.

DRL type	Sales-weighted percentage
Low-beam headlamps	**38.9**
Reduced-intensity high-beam headlamps	36.4
Turn-signal lamps	21.1
Dedicated DRLs	3.6

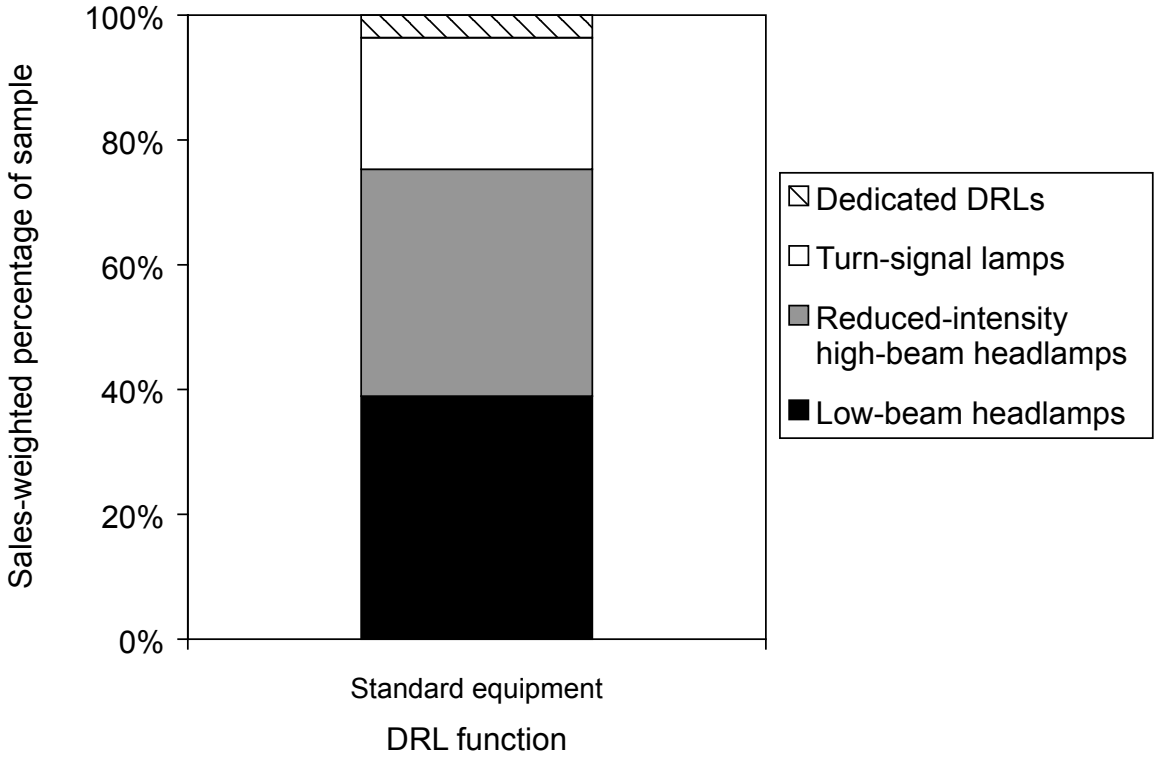

Figure 5. Sales-weighted distribution of DRL types used as standard equipment in the 2007 sample.

DRL configurations by vehicle type in the 2007 sample

DRL configurations used as standard equipment by vehicle type are summarized in Table 7 and shown graphically in Figure 6. Reduced-intensity high-beam headlamps are used most frequently for passenger cars (55%). Pickup trucks and SUVs most frequently employ low-beam headlamps (100% and 63%, respectively). The vans in our sample used turn-signal lamps only.

Table 7
Sales-weighted distribution of DRL type used as standard equipment by vehicle type in the 2007 sample. The entries in each cell are sales-weighted percentages. Bold numbers indicate the highest value in each column.

DRL type	Vehicle type			
	Passenger car	Pickup	SUV	Van
Low-beam headlamps	15.5	**100.0**	**62.9**	
Reduced-intensity high-beam headlamps	**54.9**		14.9	
Turn-signal lamps	29.6			**100.0**
Dedicated DRLs			22.2	

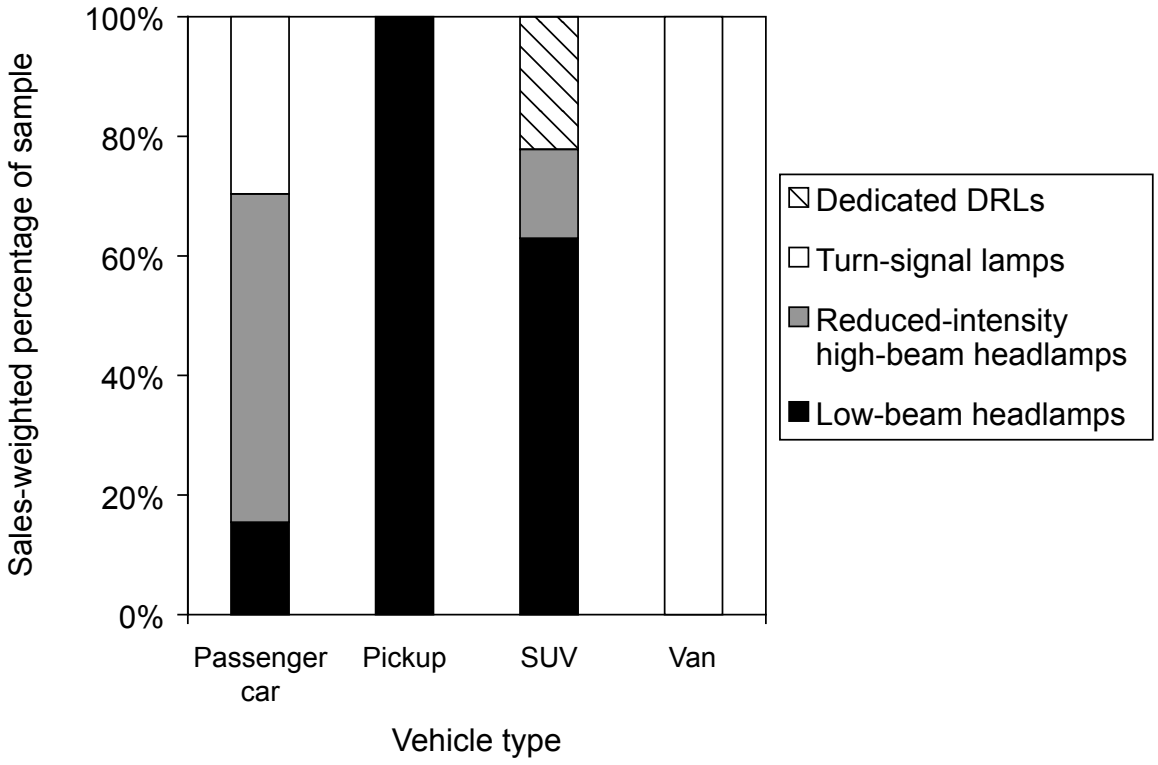

Figure 6. Sales-weighted distribution of DRL type used as standard equipment by vehicle type in the 2007 sample.

Conclusions

This report documents the trends in market-weighted availability of DRLs on the best-selling vehicle models in the U.S. for model years 2000, 2004, and 2007. Also presented are analyses of how DRLs are implemented on the current vehicles.

In general, the availability of DRLs as standard equipment in our samples has increased from 2000 to 2007. The current availability depends on vehicle type. For example, there are still few vans equipped with DRLs (13%), but they have become a common feature on passenger cars (61%). For vehicles with DRLs as standard equipment, low-beam headlamps are the most common implementation (39%); in terms of trends by vehicle type, passenger cars most frequently use reduced-intensity high-beam headlamps (55%).

As more countries adopt laws requiring DRL installation and usage, the prevalence of DRLs in countries that do not currently require them, including the U.S., is also expected to increase. Given the evidence that DRLs reduce crashes, it is likely that the continuing increase in DRL installations in the U.S. will lead to even greater crash reductions.

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Appendix A: Vehicles included in the 2000 sample.

Model	Maker	Sample share %	Market share %
F-series	Ford	12.86	5.05
Silverado	Chevrolet	9.42	3.70
Explorer	Ford	6.53	2.57
Camry	Toyota	6.21	2.44
Accord	Honda	5.94	2.33
Taurus	Ford	5.61	2.20
Ram pickup	Dodge	5.59	2.20
Ranger	Ford	4.84	1.90
Civic	Honda	4.76	1.87
Focus	Ford	4.20	1.65
Caravan/Grand Caravan	Dodge	4.19	1.65
Grand Cherokee	Jeep	3.99	1.57
Cavalier	Chevrolet	3.48	1.36
Corolla	Toyota	3.38	1.33
Blazer	Chevrolet	3.32	1.30
Windstar	Ford	3.26	1.28
Grand Am	Pontiac	3.15	1.24
Expedition	Ford	3.13	1.23
S10	Chevrolet	3.10	1.22
Malibu	Chevrolet	3.04	1.19
	Total:	100.00	39.28

Appendix B: Vehicles included in the 2004 sample.

Model	Maker	Sample share %	Market share %
F-series	Ford	13.08	5.07
Silverado	Chevrolet	10.58	4.10
Ram pickup	Dodge	6.95	2.69
Camry	Toyota	6.39	2.48
Accord	Honda	6.15	2.39
Explorer	Ford	5.77	2.24
Taurus	Ford	4.65	1.80
Civic	Honda	4.64	1.80
Impala	Chevrolet	4.14	1.61
TrailBlazer	Chevrolet	4.04	1.57
Corolla	Toyota	3.99	1.55
Cavalier	Chevrolet	3.97	1.54
Caravan/Grand Caravan	Dodge	3.61	1.40
Focus	Ford	3.55	1.38
Ranger	Ford	3.24	1.25
Grand Cherokee	Jeep	3.21	1.24
Altima	Nissan	3.11	1.21
Tahoe	Chevrolet	3.08	1.19
Sierra	GMC	3.04	1.18
Expedition	Ford	2.81	1.09
	Total:	100.00	38.78

Appendix C: Vehicles included in the 2007 sample.

Model	Maker	Sample share %	Market share %
F-series	Ford	8.21	4.81
Silverado	Chevrolet	6.56	3.84
Camry	Toyota	4.62	2.71
Ram pickup	Dodge	3.76	2.20
Accord	Honda	3.66	2.14
Civic	Honda	3.26	1.91
Impala	Chevrolet	2.99	1.75
Corolla	Toyota	2.81	1.64
Altima	Nissan	2.40	1.40
Cobalt	Chevrolet	2.18	1.28
Caravan/Grand Caravan	Dodge	2.18	1.28
Sierra	GMC	2.17	1.27
Explorer	Ford	1.85	1.08
Tacoma	Toyota	1.84	1.08
Odyssey	Honda	1.83	1.07
Focus	Ford	1.83	1.07
Taurus	Ford	1.80	1.06
TrailBlazer	Chevrolet	1.80	1.06
CR-V	Honda	1.75	1.03
Mustang	Ford	1.72	1.01
Malibu	Chevrolet	1.69	0.99
Sienna	Toyota	1.68	0.99
Tahoe	Chevrolet	1.67	0.98
Town & Country	Chrysler	1.64	0.96
G6	Pontiac	1.63	0.95
Escape	Ford	1.62	0.95
Pilot	Honda	1.57	0.92
RAV4	Toyota	1.57	0.92
Sonata	Hyundai	1.54	0.90
E-series van	Ford	1.53	0.89
300	Chrysler	1.48	0.87
Fusion	Ford	1.47	0.86
Grand Cherokee	Jeep	1.43	0.84
PT Cruiser	Chrysler	1.43	0.84
Liberty	Jeep	1.38	0.81
Highlander	Toyota	1.34	0.78
Tundra	Toyota	1.28	0.75
Express/G van	Chevrolet	1.27	0.74
3-series	BMW	1.24	0.73
Sentra	Nissan	1.22	0.71
Matrix	Toyota	1.19	0.69
Charger	Dodge	1.18	0.69
Equinox	Chevrolet	1.17	0.69
Grand Prix	Pontiac	1.12	0.66
RX 330/350/400h	Lexus	1.12	0.65
Prius	Toyota	1.10	0.65
Jetta	VW	1.07	0.62
4Runner	Toyota	1.06	0.62
Ion	Saturn	1.05	0.62
HHR	Chevrolet	1.04	0.61
	Total:	100.00	58.57