Headlights On At All Times Law (SB73 - 2009)
Estimate of Sign Cost

Community/Area	Location	No of Signs
Prudhoe Bay	Departing South, Dalton Hwy	1
Fairbanks	Departing, Steese, Parks, Richardson	3
Delta	Departing, Richardson, Alaska Hwy N&S	3
Tok	Departing, Tok Cutoff W, Alaska Hwy N&S	3
Alaska Border-Alaska Hwy	For W-bound arrivals	1
Glenallen	Departing, Glen W, Richardson N&S	3
Wasilla	Departing, Parks Hwy N	1
Palmer	Departing, Glen Hwy E	1
Valdez	Departing Richardson Hwy N	1
Glen-Parks Interchange	Departing Glen E, Glen S, Parks N	3
Anchorage	Airport	2
	Departing South-Seward Hwy	1
	Departing North, Glen Hwy	1
Kenai	Airport	1
Seward	Departing, Seward Hwy N	1
Soldotna	Airport	1
	Departing, Sterling Hwy N&S	2
Homer	Departing, Sterling Hwy N	1
Haines	Departing Haines Hwy N	1
Alaska Border-Haines	For S-bound arrivals	1
Skagway	Departing Klondike Hwy N	1
Alaska Border-Klondike	For S-bound arrivals	1
Juneau	Ferry Terminal	1
	Airport, Yandukin& Shell Simmons	2
Ketchikan	Ferry Access to Airport-both sides on Tongass	2

39 Signs

Intent:

Install signs at:
Major Airports
Major Ferry Terminals
At Major Junctions
At border crossings

We want to minimize the number of signs- just post at major entry points or junctions of high volume roads

4 Line Sign

7	ft. wide
4.5	ft. tall
31.5	s.f.
110	$/s.f.
3465	Sign Cost
$ 135,135	Total

R16-XXX

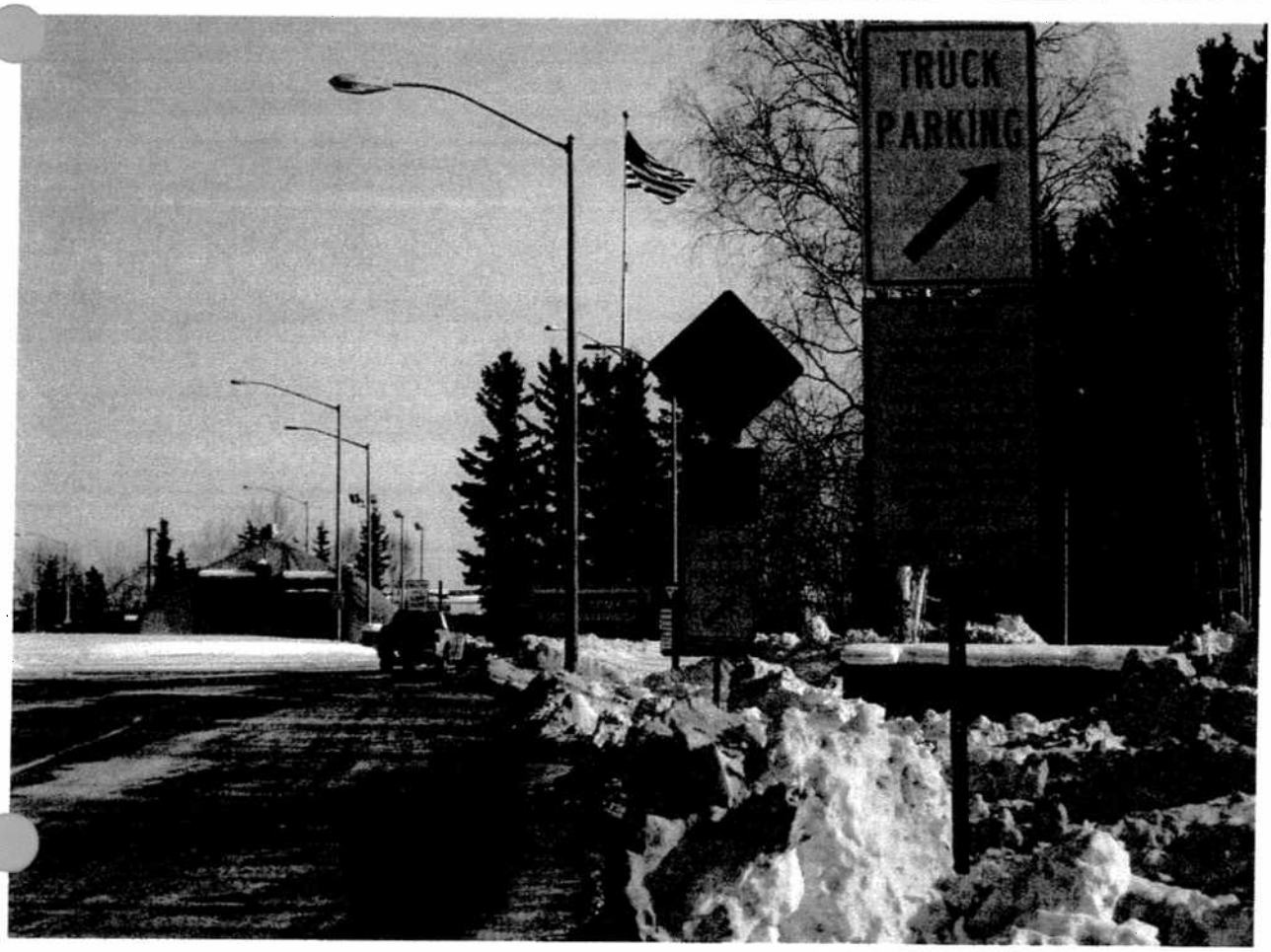
Border and Legend: Black
Background: White, Fluorescent Yellow

DRAFT

Road Class	Dimensions (inches)								
	A	B	C	D	E	F	G	H	R
Minimum	60	42	0.63	0.88	3.0	6C	4.0	1.56	2.25
Conventional	84	54	0.75	1.25	4.25	8C	4.75	2.38	3.0

HB 181


WARNING
• You are entering a Federal Military Installation.
• All vehicles and persons are subject to search.
• Caution–this area patrolled by Military Working Dogs.
• State traffic laws are enforced on this post by authority of DODD 5525.4.
••• DIM LIGHTS •••
• PREPARE TO STOP •
THE FAIRBANKS AND NORTHSTAR BOROUGH COMMUNITIES SUPPORT OUR MILITARY AND VETERANS


TRUCK PARKING

Elemendorf AFB - Rick Feller – DOT&PF Public Information Officer

I visited the main Elmendorf AFB entrance off Boniface Parkway and the main Ft. Richardson entrance off the Glenn Highway from all directions. I followed all approaches from miles in advance, up to the guard stations. I saw no evidence of "Please Turn Headlights Off" signs whatsoever. There may be such signage at the gates and guard stations, but none visible from as close as I could get.

Kodiak:

The base number is 907-487-5555. The officer that answered the phone provided the following information:

A sign is posted about ten feet from the guardhouse that says, in effect, "Please Turn Off Headlights as you Approach the Gate." The approach from the main road to the guardhouse is about 50 feet in length.

Ketchikan:

The base at 907-228-0340. The Officer of the Day provided the following information:

A portable sign is set up whenever the gate is manned. The sign says "Please Dim Headlights." The sign is placed about 20-25 feet from the gate. The approach from the main road to the gate is about 50 feet in length

AMHS

Staging Areas (parking lots) These are not considered by statute a part of a highway system. Signs will be posted so vehicles leaving the staging areas will be advised to turn their headlights on.

"highway" includes a highway (whether included in primary or secondary systems), road, street, trail, walk, bridge, tunnel, drainage structure and other similar or related structure or facility, and right-of-way thereof, and further includes a ferry system, whether operated solely inside the state or to connect with a Canadian highway, and any such related facility.

Boarding a Ferry -

Some vehicles are manufactured so their lights are always on. The requirement for "headlights on all the time" is a Canadian requirement and our staff deal with this as we board cars in Prince Rupert. AMHS policy is to request drivers turn off their lights. If the driver does not want to or can't the purser or boarding folks deal with it. There has never been an issue over this that I know of.

HH.3 Headlights On at All Times – Tier One

Description: Around 15 people die in Alaska each year in head-on crashes. National data indicate headlights-on signing and enforcement could eliminate 7 to 15 percent of these crashes.

This plan recommends changing state law to require headlights on at all times. If this is not done, we can still post signs that will make headlights mandatory on particular sections of road. 13 AAC 04.010 gives the signs the authority of law.

Responsible Agency:

Lead Agency: Alaska Department of Transportation and Public Facilities, Alaska Highway Safety Office (AHSO)

Contact Name, Title: Cindy Cashen, Highway Safety Office Administrator

Phone: (907) 465-4374 E-mail: Cindy.Cashen@alaska.gov

Necessary Partners:

- Governor's Alaska Highway Safety Office.
- DOT&PF Headquarters and Regional Offices.
- Legislature.
- Media.
- AG's Office.
- State Troopers/Local Police.
- National Insurance Institute.
- NHTSA.

Data Analysis Needs or Available Resources:

Create a statewide map of head-on collisions, insurance report, photos, past country/state success stories.

Expected Effectiveness/Outcome:

Narrative: To eliminate fatal and major injury crashes – estimate number yet to be determined.

Average number of lives lost and major injuries sustained due to this problem over the past five years: Approximately 15 per year.

Estimated number of lives saved and major injuries prevented in one year following implementation: One.

Funding and Resource Requirements:

Narrative: Funding for AHSO to cover legal costs – approximately $10K. If signs are posted, approximately $1,000 per sign.

Estimated Cost to Implement: $ TBD

Action Steps and Timeline

Action Step	Responsible Agency	Timeline/Due Date
Collect data and success stories in a draft packet for the legislature.	AHSO	December 2007
Collaborate with partners to develop a legislative information/ lobby plan.	AHSO	December 2007
Pass Legislation.	Legislature	May 2008
If successful, install signs in high-crash areas. (This could happen earlier.)		

Measurement and Evaluation

Strategy Performance Measures: Reduction in head-on collisions.

Evaluation:

Reduction in head-on collisions as indicated by before/after crash studies.

Table 1: State Requirements for Headlight Use When Operating Passenger Vehicles

State	Headlights Must be Used				Maximum Sight Distance Before Headlight Use is Mandatory (in feet)
	Half Hour After Sunset and Half Hour Before Sunrise	From Sunset to Sunrise	When Windshield Wipers are Operating	During Inclement Weather	
Alabama		Yes	Yes		500
Alaska	Yes				1,000
Arizona		Yes			500
Arkansas	Yes		Yes		500
California	Yes		Yes		1,000
Colorado		Yes			1,000
Connecticut	Yes			Yes	1,000
Delaware		Yes	Yes		1,000
Florida		Yes		Yes	1,000
Georgia	Yes			Yes	500
Hawaii	Yes				200
Idaho	Yes				500
Illinois		Yes	Yes		1,000
Indiana		Yes			500
Iowa		Yes		Yes	500
Kansas		Yes			1,000
Kentucky	Yes				350
Louisiana		Yes	Yes		500
Maine	Yes		Yes	Yes	1,000
Maryland	Yes		Yes		1,000
Massachusetts	Yes		Yes		200
Michigan	Yes				500
Minnesota		Yes		Yes	500
Mississippi		Yes			500
Missouri	Yes				500
Montana	Yes			Yes	500
Nebraska	Yes				500
Nevada	Yes				1,000
New Hampshire	Yes			Yes	1,000
New Jersey	Yes		Yes	Yes	500
New Mexico	Yes				500
New York	Yes		Yes	Yes	1,000
North Carolina		Yes	Yes		400
North Dakota		Yes		Yes	1,000
Ohio	Yes				1,000
Oklahoma	Yes			Yes	500
Oregon		Yes			1,000
Pennsylvania		Yes	Yes	Yes	1,000
Rhode Island		Yes	Yes	Yes	500
South Carolina	Yes		Yes		500
South Dakota	Yes				200
Tennessee		Yes		Yes	200
Texas	Yes				1,000
Utah	Yes			Yes	1,000
Vermont	Yes			Yes	150
Virginia		Yes	Yes		500
Washington	Yes				1,000
West Virginia		Yes		Yes	500
Wisconsin	Yes				500
Wyoming	Yes			Yes	1,000

Sources: *Digest of Motor Laws*, American Automobile Association, 2009, and the National Conference of State Legislatures, (303) 364-7700.

BusinessWeek

JANUARY 3, 2006

SAFETY TIPS

Q&A: Daytime Running Lights

as of December 2005

1. What are the safety advantages of DRLs? Daytime running lights (DRLs) are a low-cost method to reduce crashes. They are especially effective in preventing daytime head-on and front-corner collisions by increasing vehicle conspicuity and making it easier to detect approaching vehicles from farther away.

2. Where are DRLs required? Laws in Canada, Denmark, Finland, Hungary, Iceland, Norway, and Sweden require vehicles to operate with lights on during the daytime. There are two types of laws. Canada's requires vehicles to be equipped with DRLs. The other type of law (in effect in Denmark, Finland, Hungary, Iceland, Norway, and Sweden) requires motorists to turn on their headlights if their vehicles do not have automatic DRLs. In 1972, Finland mandated daytime running lights in winter on rural roads and a decade later made DRLs mandatory year-round. Sweden's law took effect in 1977, Norway's in 1986, Iceland's in 1988, and Denmark's in 1990. Hungary has required drivers on rural roads to operate with vehicle lights on since 1993. Canada requires DRLs for vehicles made after December 1, 1989. No U.S. state mandates DRLs, but some require drivers to operate vehicles with lights on in bad weather.

3. Are DRLs available on vehicles in the United States? First offered on a handful of 1995 domestic and foreign model passenger cars, pickups, and SUVs, daytime running lights are becoming a more common feature. They are standard on all General Motors, Lexus, Mercedes Benz, Saab, Subaru, Suzuki, Volkswagen, and Volvo models as well as some Toyota models. GM offers retrofit kits for vehicles that do not already have DRLs. The kits can be used on non-GM models, too.

4. How effective are DRLs? Nearly all published reports indicate DRLs reduce multiple-vehicle daytime crashes. Evidence about DRL effects on crashes comes from studies conducted in Scandinavia, Canada, and the United States. A study examining the effect of Norway's DRL law from 1980 to 1990 found a 10 percent decline in daytime multiple-vehicle crashes.[1] A Danish study reported a 7 percent reduction in DRL-relevant crashes in the first 15 months after DRL use was required and a 37 percent decline in left-turn crashes.[2] In a second study covering 2 years and 9 months of Denmark's law, there was a 6 percent reduction in daytime multiple-vehicle crashes and a 34 percent reduction in left-turn crashes.[3] A 1994 Transport Canada study comparing 1990 model year vehicles with DRLs to 1989 vehicles without them found that DRLs reduced relevant daytime multiple-vehicle crashes by 11 percent.[4]

In the United States, a 1985 Institute study determined that commercial fleet passenger vehicles modified to operate with DRLs were involved in 7 percent fewer daytime multiple-vehicle crashes than similar vehicles without DRLs.[5] A small-scale fleet study conducted in the 1960s found an 18 percent lower daytime multiple-vehicle crash rate for DRL-equipped vehicles.[6] Multiple-vehicle daytime crashes account for about half of all police-reported crashes in the United States. A 2002 Institute study reported a 3 percent decline in daytime multiple-vehicle crash risk in nine U.S. states concurrent with the introduction of DRLs.[7] Federal researchers, using data collected nationwide, concluded that there was a 5 percent decline in daytime, two-vehicle, opposite-direction crashes and a 12 percent decline in fatal crashes with pedestrians and bicyclists.[8]

5. Will DRLs shorten headlamp bulb life or lower fuel economy? Running vehicle lights in the daytime does not significantly shorten bulb life. Systems like those on General Motors cars that use high beams are designed to operate at half their normal power during daylight hours, thereby conserving energy and reducing the effect on a vehicle's fuel economy. The National Highway Traffic Safety Administration (NHTSA) estimates that only a fraction of a mile per gallon will be lost, depending on the type of system used. GM estimates the cost to be about $3 per year for the average driver. Transport Canada estimates the extra annual fuel and bulb replacement costs to be $3-15 for systems using reduced-intensity headlights or other low-intensity lights and more than $40 a year for DRL systems using regular low-beam headlights.

6. Will motorists be bothered by glare? In most countries mandating DRLs, glare has not been an issue. However, some motorists in the

TØI report 688/2003
Authors: Rune Elvik, Peter Christensen, Svenn Fjeld Olsen
Oslo 2003, 94 pages English language

Summary:

Daytime running lights: A systematic review of effects on road safety

This report presents a systematic review of the effects on road safety of daytime running lights (DRL) for cars and motorcycles. The objective of this review is to provide the best current estimates of the effects on road accidents of using DRL on cars or motorcycles. In addition to reviewing the safety effects of DRL, the report presents an analysis of costs and benefits of introducing mandatory use of DRL in the European Union.

Questions answered in this report

The report provides answers to the following questions regarding the effects of daytime running lights on road safety:

1. What is the best estimator of the effects on accidents of daytime running lights?
2. What is the quality of the evidence provided by studies that have evaluated the safety effects of daytime running lights? Can these studies be trusted?
3. Are the effects of daytime running lights novelty effects that are likely to erode and possibly disappear completely over time?
4. What is the relationship between the effects of daytime running lights for each vehicle using it (intrinsic effects) and the effects of laws or campaigns that lead to an increased use of daytime running lights in a country or part of a country (aggregate effects)?
5. Do the effects of daytime running lights vary depending on geographical latitude?
6. Do the effects of daytime running lights vary with respect to accident severity?
7. Do the effects of daytime running lights depend on season (winter, summer)?
8. Do daytime running lights have adverse effects on accidents involving pedestrians, cyclists or motorcyclists or on rear-end collisions?
9. What are the costs and benefits of requiring all motor vehicles in the European Union to use daytime running lights?

The report can be ordered from:
Institute of Transport Economics, PO Box 6110 Etterstad, N-0602 Oslo, Norway
Telephone: +47 22 57 38 00 Telefax: +47 22 57 02 90

Approach taken to answer questions

In order to answer the questions asked above, a systematic review of studies that have evaluated the effects on road safety of daytime running lights has been undertaken. A literature search was conducted in order to identify relevant evaluation studies. A total of 25 studies that have evaluated the safety effects of DRL for cars and a total of 16 studies that have evaluated the safety effects on DRL for motorcycles was found. Evidence from these studies has been summarised by means of meta-analysis. A meta-analysis is a statistical analysis of estimates of effect provided by each study, with the objective of combining all estimates of effect into a summary estimate. The summary estimate of effect should ideally be an unbiased estimate of the weighted mean effect, based on the individual estimates of effect. An appendix to the report explains the details of the meta-analysis.

Results of the meta-analysis of safety effects were used as input to the cost-benefit analysis. Estimates of the costs of daytime running lights were based on previous studies.

Main findings of the study

The main findings of the study, presented in the same order as the questions asked above, can be summarised as follows.

Estimators of the effects of daytime running lights

Three estimators of the safety effects of daytime running lights have been used in evaluation studies. These three estimators are labelled the accident rate ratio, the odds ratio and the ratio of odds ratios. In the report, estimates of effect obtained by each of the estimators have been compared. In nearly all cases, the three estimators give estimates that are close to each other. The choice of estimator for measuring the safety effect of daytime running lights does therefore not decisively influence the conclusions reached.

A simple simulation was conducted in order to test the performance of the three estimators in the presence of various confounding effects that could generate biased estimates of the effects of DRL. It was found that neither of the three estimators adequately control for confounding, and that all of them can give biased estimates of the effects of DRL. In view of this, it is necessary to critically assess the quality of studies that have evaluated the effects of DRL.

Quality of evaluation studies

A systematic assessment of the quality of evaluation studies was made, based on four criteria of study quality:

1. The extent to which a study specifies accident severity.
2. The extent to which a study specifies various types of accident that may be affected by DRL.

3. The extent to which a study controls for confounding factors that may distort estimates of the effects of DRL.
4. Whether or not a study provides information on the use of DRL in the country or region in which the study was conducted.

Based on these criteria, an overall score for study quality was developed, ranging from 0 (worthless study) to 1 (perfect study). No evaluation study obtained the maximum score for quality. Recent studies of the intrinsic effects of DRL for cars tend to be of poorer quality than older studies. Studies of the effects of DRL for motorcycles are of poorer quality than studies of the effect of DRL for cars. In general, studies do not have an ideal quality and it cannot be ruled out that some estimates of the effects of DRL are influenced by confounding factors.

Novelty effects

There are indications that the effects of laws mandating the use of DRL tend to diminish over time. However, not all studies that have evaluated the effects of DRL-laws have found such a tendency. It is therefore concluded that further study is needed in order to determine more precisely the duration and stability over time of the effects of DRL-laws. As far as the cost-benefit analysis in this report is concerned, it has been assumed that the effects of a DRL-law are maintained for a period of at least twelve years.

Intrinsic and aggregate effects of DRL

The best current estimates of the intrinsic and aggregate effects of DRL are as follows:

- Intrinsic effect of DRL for cars: 5-10% reduction of multi-party daytime accidents.
- Effect of DRL-laws or campaigns for cars (aggregate effects): 3-12% reduction of multi-party daytime accidents.
- Intrinsic effect of DRL for motorcycles: 32% reduction of multi-party daytime accidents (a very uncertain estimate, 95% CI: -64%, +28%).
- Effect of DRL-laws or campaigns for motorcycles (aggregate effects): 5-10% reduction of multi-party daytime accidents.

Variation in effects of DRL with respect to geographical latitude

The relationship between geographical latitude and effects of DRL has been investigated. Only a very weak relationship was found, indicating that the effects of DRL tend to increase the further away from the Equator one moves.

In the cost-benefit analysis, however, a single estimate of effect for the whole European Union has been applied.

Variation in effects of DRL with respect to accident severity

There is evidence showing that the effects of DRL vary according to accident severity. DRL has the greatest effects on the most severe accidents. Unfortunately, evidence concerning the effects on fatal accidents is rather weak and inconsistent, and does not permit a very reliable prediction of the effect to be made.

In the cost-benefit analysis, DRL has been assumed to reduce fatal multi-party daytime accidents by 15%, serious injury multi-party daytime accidents by 10%, and slight injury multi-party daytime accidents by 5%. No effect on property-damage-only accidents has been assumed.

Seasonal variation in effects of DRL

Evidence concerning variation in the effects of DRL with respect to season is sparse and inconclusive. In the cost-benefit analysis, no seasonal variation in effects has been assumed.

Potential adverse effects of DRL for certain types of accident

Based on the meta-analysis, it is concluded that the DRL for cars is unlikely to have any adverse effects on accidents involving pedestrians, cyclists or motorcyclists. Some estimates indicate an adverse effect of DRL-laws for pedestrian accidents, but the summary estimate of effect, taking all individual estimates into account, indicates a reduction in pedestrian accidents.

It is likely that a DRL-law could have an adverse effect on rear-end collisions. Again, however, the evidence is somewhat mixed and alternative interpretations cannot be ruled out. The use of high mounted stop lamps is encouraged in order to counteract any adverse effect of DRL on rear-end collisions. The use of full beam headlights on motorcycles can make them more conspicuous without causing glare to other road users.

Costs and benefits of mandatory use of DRL in the European Union

Costs and benefits of five different policy options for the introduction of mandatory use of DRL in the European Union have been assessed. These five options are:

1. Requiring drivers to turn on headlights during daytime (behavioural measure only).
2. Requiring drivers to turn on headlights in daytime and requiring new cars to have automatic DRLs, using low beam headlights as DRLs (behavioural + technical).
3. Requiring drivers to turn on headlights in daytime and requiring new cars to have dedicated DRLs (behavioural + technical).
4. Requiring new cars to have automatic DRLs, using low beam headlights as DRL's (technical measure only)

5. Requiring new cars to have automatic, dedicated DRLs (technical measure only)

Benefits were found to exceed costs for all policy options. Policy option 1 (behavioural measure only) was found to be the most cost effective, having a benefit-cost ratio close 2.0. The benefit cost-ratio for the other policy options ranged between 1.4 and 1.7.

While it cannot be entirely ruled out that benefits are smaller than costs, the probability that this is the case is small, ranging between 12% and 25% for the various policy options. The results of the cost-benefit analysis made in this report are consistent with the results of other cost-benefit analyses that have been reported in recent years.

Concerns about meta-analysis

The summary estimates of effects of DRL presented in this report are based on meta-analysis of evaluation studies. There are several techniques of meta-analysis, which can result in different summary estimates of effect. Extensive sensitivity analyses have therefore been undertaken in order to test the robustness of the summary estimates of effect with respect to various analytical choices made. These sensitivity analysis include the following:

1. The preparation of funnel plots and an examination of these with respect to the statistical properties of the distribution of estimates of effect (a single mode, no skewness, no outlying data points).
2. Testing for the presence of publication bias in the set of estimates available, and adjusting for publication bias if it is found.
3. The use of both a fixed-effects model and a random-effects model in all analyses.
4. Testing the sensitivity of summary estimates of effect with respect to the statistical weighting of individual estimates of effect.
5. Testing the sensitivity of summary estimates of effect with respect to the quality score assigned to each study.
6. Testing the sensitivity of summary estimates of effect with respect to the inclusion or exclusion of a single study.

The results of these tests can briefly be summarised as follows. Funnel plots show that a summary, mean estimate of effect makes sense both with respect to DRL for cars and with respect to DRL for motorcycles. A weighted summary estimate of effect correctly represents the centre of gravity in all distributions of estimates of effect.

A slight publication bias was found in all data sets. Adjusting for it had only a marginal effect on the summary estimates of effect, modifying them by at most one percentage point (e. g. from -9% to -8%).

Summary estimates of effect are virtually identical for the fixed-effects and random-effects models of analysis. Estimates based on the random-effects

analysis are statistically the most appropriate, as all data sets contained a large element of systematic variation in estimates of effect.

Summary estimates of effect are not sensitive to the statistical weighting adopted.

Summary estimates of effect are not very sensitive to study quality assessment. This means that if one were to exclude the studies with lowest quality score, summary estimates of effect would remain more or less unaffected. Since no study gets a full score for quality, the real issue is whether the evidence provided by these studies should be taken seriously or rejected altogether. This report concludes that the evidence from evaluation studies should be taken seriously, for the following reasons:

1. There are theoretical reasons, based on studies of human perception, to believe that DRL improves conspicuity and that improving conspicuity can prevent accidents.
2. Randomised controlled trials of DRL have found them to be effective in preventing accidents. These findings have been reproduced in non-experimental studies.
3. The findings of different studies that have evaluated the effects of DRL are highly consistent. Very few estimates of effect depart from the general pattern by indicating an increase of the number of accidents.

Despite the fact that shortcomings can be found in virtually all evaluation studies, it is concluded that the evidence from these studies is likely to mainly reflect the effects of daytime running lights, and not of confounding factors not controlled for in the studies.

With very few exceptions, a single study does not decisively influence the summary estimates of effect. The summary estimates of effect therefore reflect the combined contributions to knowledge of all reported evaluation studies.