

MAINE STATE LEGISLATURE

The following document is provided by the
LAW AND LEGISLATIVE DIGITAL LIBRARY
at the Maine State Law and Legislative Reference Library
<http://legislature.maine.gov/lawlib>



Reproduced from scanned originals with text recognition applied
(searchable text may contain some errors and/or omissions)

**Final Report of the Working Group
on
The Use of Biotopic or Telescopic Lenses for Testing and
Driving**



**Presented to the
Joint Standing Committee on Transportation
January 29, 2014**

**Prepared by the Office of the Secretary of State
Bureau of Motor Vehicles and the Medical Advisory Board
Pursuant to the Resolves of 2013, Chapter 21**

Table of Contents

I.	Executive Summary	2
II.	Background Information	4
III.	Study Process for Driving with Bioptic or Telescopic Lenses	7
IV.	Conclusions and Recommendations of Secretary of State	12
V.	Appendices	
•	Appendix A	Resolves of 2013, Chapter 21 (LD 564)
•	Appendix B	Working Group Membership
•	Appendix C	Positions of Working Group Members
•	Appendix D	Bureau of Motor Vehicles Administration of Low Vision Drivers
	1.	Administrative Rule 29-250 Chapter 3: Physical, Emotional, and Mental Competence to Operate a Motor Vehicle
	2.	Bureau of Motor Vehicles Memorandum about Bioptic Lenses
	3.	Study of Low Vision Accidents Before and After Medical Review
•	Appendix E	Driver Fitness Medical Guidelines, National Highway Traffic Safety Administration and American Association of Motor Vehicle Administrators
•	Appendix F	Data Overview and Comparison of State Laws
	1.	Bioptic Driver Data Review by Duane Brunell, Maine Department of Transportation
	2.	Summary of Owsley Study by Dr. Robert Dreher, Medical Advisory Board
	3.	Survey on Bioptics, American Association of Motor Vehicle Administrators
	4.	2013 Survey of Other States, Maine Bureau of Motor Vehicles
	5.	Comparison of States' Bioptic Driving Laws by Steve Kelley, The Iris Network
•	Appendix G	Resources Utilized by the Working Group



Executive Summary

As required by the Resolves of 2013, Chapter 21 (LD 564) the Secretary of State, Bureau of Motor Vehicles (BMV) and Medical Advisory Board (MAB) convened a group of stakeholders in the fall of 2013. The resolve required the group to:

- Study the current vision standards for obtaining a driver's license
- Review the current prohibition against the use of bioptic or telescopic lenses for meeting visual acuity requirements to obtain a driver's license or while driving a motor vehicle.
- Report to the Joint Standing Committee on Transportation its findings and recommendations concerning the use of Bioptic Telescopic Lenses (hereafter referred to as BTLs) to meet visual acuity requirements for obtaining a driver's license and while driving a motor vehicle. It is important to note that current rules do not prohibit the use of BTLs for driving.

The Working Group met three times between September and December. They shared and reviewed information at the meetings and by e-mail in between. Points of discussion and review included: the history of BTLs in Maine, BTL licensing standards in other states concerning meeting visual acuity standards, taking a road test and driving, the benefits of allowing BTLs, crash rate information for BTL drivers, and options for addressing the issue.

The Secretary of State makes the following recommendations:

- Change the minimum visual acuity standard from 20/70 to 20/100 in the best eye, with correction.
- The Secretary of State does not recommend the Legislature proceed with allowing the use of BTLs to meet the minimum visual acuity standard.
- Allow Medical Advisory Board to recommend restrictions for low vision and BTL drivers for inclusion in the Department's Rule 29-250, Chapter 3.
- If a driver passes the vision test with a visual acuity of 20/100, allow BTLs to be used when taking a road test.
- Establish a mechanism for BMV to identify persons taking the road test using BTLs.
- Encourage training to drive with BTLs if using them to road test and drive.

These recommendations are from the majority of the Working Group. Specific opinions of individuals within the Working Group are summarized in Appendix C.

Background Information

The issue of using BTLs to meet vision standards and driving with the lenses is not new in Maine. The Working Group reviewed a substantial amount of information in reaching its recommendation presented in this report. This included historical data from within BMV, including accident rates, statutory and rule changes, and Medical Advisory Board minutes regarding the use of BTLs.

The MAB first studied the use of BTLs for driving in Maine in 1979. In 1980, the Ophthalmology Task force recommended licensure of drivers using BTLs based on the standard of 20/100 with carrier lens (glasses) and 20/40 with BTLs. About twenty-five drivers were licensed using this standard, with geographic and temporal (daylight) restriction. In 1983, a follow-up study was conducted via a survey of sixteen of the known remaining drivers with BTLs. Fourteen drivers responded to the survey. The remaining two were identified and BMV reviewed their driver's licenses. Six of those drivers voluntarily surrendered their license due to inability to meet vision standards. Of the fourteen that responded, five had experienced accidents. The driving records of the two licensees that did not respond showed four accidents, with the last accident resulting in a double fatality.

Bureau of Motor Vehicle personnel "analyzing the accident reports of the five accidents involving the fourteen BTL drivers found that all five accidents were caused by the BTL driver because he or she failed to observe other traffic." The BMV also noted, "Personnel analyzing accident reports for the 4 accidents found lack of visual ability to be the primary cause of the accidents."

Between 1982 and 1988, BMV rules went back and forth between allowing and disallowing the use of BTLs to pass the visual acuity test. In 1988, the BMV adopted the current Rule 29-250, Chapter 3 (Appendix D₁) to require a visual acuity of 20/40 in the best eye to drive-without restrictions, and up to a minimum visual acuity of 20/70 in each eye, with restrictions. Visual acuity of less than

20/70 precludes driving. The Rule prohibits a driver from using BTLs to meet the visual acuity standard or to take the road test. The Rule is silent on driving with BTLs, and there is no prohibition against using them to drive. Currently, training to drive with BTLs is not required.

The Working Group also reviewed the status of using BTLs in other states. Currently:

- 46 states, including Maine, permit the use of BTLs while driving a vehicle.
- 43 states expressly permit the use of BTLs in their statutes, and three states (AR, NJ, NH) have unclear statutes but permit BTLs in practice.
- 34 states (not including Maine) permit the use of bioptic lenses to meet vision acuity standards for licensure. 31 states expressly permit their use for testing in state statutes, and three states (AR, NH, NJ) have unclear statutes but permit the use of BTLs to meet acuity standards for licensure in practice.
- 18 states permit licensure to drivers with vision acuity between 20/20–20/99, twelve states permit licensure with 20/100, twenty states permit licensure over 20/100, and 1 state permits licensure with vision acuity of 20/400.
- 12 states expressly require additional training in order to be granted licensure when using a BTL to pass the vision acuity requirements or road test. It is unclear from a description who is responsible for the cost for the training.

Overview of Research on Driving with BTLs

The Working Group also reviewed several national studies and recommendations for guideline on licensure of visual acuity. Two national organizations, the American Association of Motor Vehicle Administrators (AAMVA) and the

National Highway Transportation Safety Administration, find in their 2009 Driver Fitness Medical Guidelines that there is a growing consensus that visual acuity of 20/70- 20/100 is “probably not a threat to safe driving” (Appendix E). This report, and several other academic research studies, state that there is no clear evidence supporting or opposing the safety of biopic driving.

Appendix F₂ includes a summary done by Robert Dreher, MD, FACS who is a member of BMV’s Medical Advisory Board of recent research done by Cynthia Owsley, PhD, MSPH on the driving abilities of licensed drivers who use BTLs. Dr. Owsley is a renowned ophthalmological research PhD that has coauthored or authored the most current research papers on low vision driving.

Study Process for Driving with Bioptic or Telescopic Lenses

The Secretary of State's Office convened the Low Vision Working Group in the fall of 2013. At the first meeting, the sixteen-member Working Group decided to have in-person meetings, and to assign committee members to gather more information between meetings on the issues affecting their respective interests. The Working Group met three times between September and December, and shared additional information via e-mail.

The meetings provided time for discussion and lively debate over the impact of allowing BTLs to be used to meet the visual acuity standard or to take the road test, as well as related issues such as training to drive with BTLs.

The Working Group was very committed to developing policy recommendations grounded in evidence-based research. Over the course of the study, members discussed the risks and benefits of allowing drivers to use BTLs to meet vision standards and take the road exam. Group members were asked to provide crash rates for BTL drivers, as well as evidence in support of allowing lower visual acuity standards and criteria for establishing effective standards of training for using BTLs to operate safely.

There is little research on the impacts of the use of BTLs and no consistent standards or practices across the states. The Working Group relied on the work of AAMVA and a survey of the states and provinces it conducted in 2009 and updated in 2013 (Appendix F₃) AAMVA received responses from thirty-three states and provinces to determine if there was any experiential data from other states and provinces that might be used to develop policy guidelines.

The BMV also conducted a survey of the respondents of the AAMVA survey for this report (Appendix F₄). Nineteen states responded to BMV's inquiry. Eleven of the nineteen indicated they allow BTLs to be used for some aspect of Driver's License testing. Five states said they do not allow BTLs to be used for any part of the testing process, and three states did not respond to that question. Only four of

the nineteen states said they track crash data for BTL drivers. The outcome of this survey highlights the lack of consistent policy standards between states.

In the states that did track crash data for BTL drivers (Maine, California, New York, and Texas), data showed drivers using BTLs experience higher crash rates than the non-BTL drivers. The BTL user accident rate for these four states range from 1.8-2.8 times higher than normalized accident rate (Appendix F). The Working Group compared these crash rates with other high-risk drivers (drivers under 24 and those over the age of 80) and noted that those driver demographics also had higher crash rates compared to norms, but are routinely licensed.

Because the specifications for BTL usage vary from state to state, there are no consistent standards about uses of BTLs for testing, requirements for training, and only four states (ME, CA, TX, NY) do any tracking of crash records for BTL drivers (Appendix F). There is little evidence to show what training is necessary, which approaches are cost effective, or what training leads to the highest level of driver safety and performance (Appendix G). As such, the Working Group felt that the research is insufficient to establish the safety or risk of driving with bioptics or to determine reasonable standards for policy writing, and believes much more research is needed to establish evidence based guidelines.

During the meetings, members shared their concerns and positions. The group acknowledged that there is no definition of “safe driving” or “standard” for determining what is an acceptable level of risk. Positions of the members did not change over the course of the study and members put their positions in writing, for inclusion in the final report.

The majority of the Working Group felt that although the subject of BTL drivers is certainly controversial, the cumulative evidence from these various surveys, studies, and articles do not provide evidence-based standards to support licensing decisions or the safety of allowing BTLs to be used to meet minimum vision standards.

Position statements are included in Appendix C, and are summarized below:

Six members of the Working Group were in favor of allowing BTLs to be used when testing to meet visual acuity standards. Eight members were opposed to allowing BTLs to be used when testing to meet visual acuity standards and two members had no position regarding the use of BTLs when testing to meet visual acuity standards.

Fourteen Members in favor of allowing BTLs to be used when taking road test and two members had no position regarding use of BTLs when taking road test.

Discussion

In reviewing the issues and making recommendations for BTL drivers, many options were discussed. These options included:

1. Leave things as they are. Currently, use of a BTL is not permitted when taking the visual acuity or driving test.
2. Clarify in rules that a person may drive with BTLs.
3. Allow use of BTLs when testing visual acuity.
4. Allow use of BTLs when taking the road test.
5. Identify BTL drivers.
6. Monitor BTL driver crash rates.
7. Revise visual acuity standards and allow lower vision parameters.

Reasons for Status Quo

The BMV, Ophthalmologists, and physicians from the Medical Advisory Board presented the following reasons to maintain the status quo.

1. There has been very little research done looking at crash rates for BTL drivers. The studies and information available do not establish the safety of driving with BTL (Appendix G).
2. There is no evidence to show BTL drivers are safe to operate a motor vehicle.
3. Maine, California, New York, and Texas data indicate a higher crash rate for BTL drivers than the normal population (Appendix G). Maine experienced fatalities caused by BTL drivers (Appendix D).

4. Due to lack of research, there is insufficient data to determine safe standards for licensing drivers drive with BTL.
5. Standards vary considerably from one state to another. There is no industry standard of practice to guide rulemaking.
6. Just because other states allow the use of BTLs for testing does not mean Maine should do so in the absence of supporting data or industry standards of practice.
7. It is the responsibility of the BMV and MAB to protect public health and promote highway safety, above all else.

Reasons to Change Rules and Allow BTLs to be used to Meet Visual Acuity Standard and Take Road Test

Advocates for the low vision population cited the following reasons in favor of changing the current rules to allow BTLs in the testing process. Their reasons included:

1. Twenty states currently allow BTLs to be used when testing to meet vision standards, as well as to take the road examination.
2. There is insufficient data to prove that BTL drivers are at significantly higher risk of crashes than other populations that are allowed to drive (i.e. teenagers, elderly, those with other medical conditions). Yet, the risk for these populations is considered manageable, and the risk for BTL drivers is not (Appendix G).
3. Massachusetts and Vermont allow BTLs to be used when taking the vision test. The drivers licensed from these states are allowed to drive in Maine, yet Maine residents are not allowed the same privilege.
4. Transportation is one of the greatest barriers to access for the low vision person who is not able to drive. Lack of access to transportation limits the independence and mobility of this population, and creates barriers to being able to work and have a higher quality of life without isolation. Maine is a rural state, and because there is very little public transportation, the problem is exacerbated.

5. The unanimous opinion of these advocates was that, with required training in the correct use of BTLs, those with low visual acuity could reasonably and safely operate a motor vehicle.
6. Working Group member Paul Cote, Assistant Director of the Division for the Blind and Visually Impaired, indicated that at least 100 visually impaired persons in Maine would benefit from being allowed to use BTLs for driving.
7. Maine should make reasonable accommodations for low vision persons to test with their BTLs and drive.

Conclusions and Recommendations of the Secretary of State

Recommendation of the Secretary of State:

The Secretary of State does not recommend the Legislature proceed with allowing BTLs to be used when testing visual acuity because there is no evidence to support the safety of allowing BTLs to be used to meet the minimum visual acuity standard (See Appendix G).

The Secretary of State does recommend changing the minimum visual acuity requirement from 20/70 in each eye to 20/100 in the best eye, with restrictions, including daylight only and geographic. Research has shown little or no association between visual acuity and crash involvement. Changing the minimum visual acuity requirement would allow a greater number of low vision drivers to be eligible for licensing.

The Secretary of State recommends that drivers meeting visual acuity standards be allowed to drive with BTLs. However, any driver with visual acuity between 20/70 and 20/100 should be required to take a road examination to demonstrate their ability to drive safely. BMV should identify and track low vision drivers and BTL users who drive, to determine their crash rates. Low vision driver's records could be reviewed retrospectively. Before further decreasing vision standards, these crash rates should be reviewed.

Recommendation of the Physicians from the Low Vision Working Group:

Physicians from the Low Vision Working Group (which included ophthalmologists and physicians representing the Medical Advisory Board) recommend continued licensure of low vision drivers, with restrictions. They recommend changing the minimum acuity from 20/70, to 20/100, in the best eye. They recommend conducting a retrospective study of low vision drivers and their crash rates and doing a prospective monitoring of low vision and BTL drivers. They also recommend that a mechanism be devised to identify drivers who use BTLs to

drive, in order to monitor their crash rates in comparison to other groups or sub-groups. This group supports the use of BTLs to road test and drive, and recommends allowing BMV to determine BTL training requirements.

Recommendation of the Advocates from the Low Vision Working Group:

The advocates of the proposed legislation seek to change the rules and allow individuals to use their BTLs to meet minimum visual acuity standards and to take the road test, as well as to drive. They also advocate that training requirements for drivers using BTLs be implemented. They make the point that many other states allow the use of BTLs for certain aspects of testing, and that although there may be higher than average crash rates for this segment of the population, their crash rates are equal to or less than other populations with greater than average crash rates (Appendix F).

The advocates for low vision drivers wish to see the following changes:

1. Change minimum visual acuity standard to 20/200.
2. Allow BTLs to be used when taking vision test.
3. Require training to use BTLs when driving.

Appendix A:
Resolve of 2013, Chapter 21



STATE OF MAINE

—
IN THE YEAR OF OUR LORD
TWO THOUSAND AND THIRTEEN

—
H.P. 383 - L.D. 564

Resolve, To Establish a Working Group To Study Vision Requirements for Obtaining a Driver's License and To Review the Current Prohibition on the Use of Telescopic or Biotpic Lenses while Driving

Sec. 1. Working group to study vision requirements for obtaining a driver's license and to review the current prohibition on the use of telescopic or biopic lenses while driving. Resolved: That the Department of the Secretary of State, Bureau of Motor Vehicles, referred to in this resolve as "the bureau," and the Medical Advisory Board, referred to in this resolve as "the board," established in the Maine Revised Statutes, Title 5, section 12004-I, subsection 84, shall convene a working group to examine current vision standards, adopted by rule by the department, to qualify for a driver's license. The working group shall review the bureau's current rule prohibiting the use of telescopic or biopic lenses for the purposes of meeting any of the visual acuity requirements for obtaining a driver's license and while driving a motor vehicle; and be it further

Sec. 2. Participants. Resolved: That the bureau and the board shall work with stakeholders, including, but not limited to, licensed physicians representing the specialty of ophthalmology, advocates for those with low vision and certified orientation and mobility specialists, when conducting the study under section 1; and be it further

Sec. 3. Report. Resolved: That by January 15, 2014 the bureau shall submit a written report of the findings under this resolve and any recommendations, including suggested legislation, to the Joint Standing Committee on Transportation. The Joint Standing Committee on Transportation may submit a bill to the Second Regular Session of the 126th Legislature relating to the subject matter of this report.



Appendix B:
Working Group Membership



Working Group Membership

Representing Low Vision and Certified Orientation and Mobility Specialists:

Leonard Cole, Chair, Board of Directors, The Iris Network Board

Steve Kelley, CVRT, CRC, The Iris Network

Pat Monahan, MA, CVRT, Bioptic User, The Iris Network

Rene Paquin, Vision Specialist, Low Vision Associates of New England

Amanda Plourde, Certified Driving Instructor, CDRS, Adaptive Driving Associates

Diane Richard, Previous Bioptic Driver, Public Representative

Representing Medical Advisory Board and Ophthalmologists:

A. Jan Berlin, MD, Medical Director, Low-vision Clinic, The Iris Network

Robert Dreher, MD, FACS, Member, BMV Medical Advisory Board (1976-present)

Fred Miller, MD, Retired, Retinal Specialist, Maine Eye Center

Daniel Onion, MD, MPH, Chair, BMV Medical Advisory Board

Linda Schumacher-Feero, MD, President-Elect, Maine Society of Eye Physicians and Surgeons

Representing State Government:

Eric Bellavance, BMV Senior Section Manager (Medical Section & Driver's Education)

Duane Brunell, Safety Performance Analysis Manager, DOT Safety Office

Thea Fickett, BMV Medical Review Coordinator

Linda Grant, BMV Director of Driver's License Services, Chair, Low Vision Workgroup

Brian Scott, Lieutenant, Commander of Traffic Safety and Legislative Liaison, Maine State Police



Appendix C:
Positions of Working Group Members



Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Following this summary, position papers from the Physician Subcommittee and Low Vision Specialists, organized alphabetically, are included.

Summary of Positions on the Use of BTLs to meet Vision Standards

In Favor	6
Opposed	8
No Position	2

I. Members in favor of allowing BTLs to meet visual acuity standards:

Leonard Cole, Chair, The Iris Network Board of Directors
Steve Kelley, CVRT, CRC, The Iris Network
Pat Monahan, Bioptic User, Vision Rehab Specialist, The Iris Network
Rene Paquin, Vision Specialist, Low Vision Associates of New England
Amanda Plourde, Certified Driving Instructor, CDRS, Adaptive Driving Associates
Diane Richard, Previous Bioptic Driver, Public Representative

II. Members opposed to allowing BTLs to meet visual acuity standards:

A. Jan Berlin, MD, Medical Director, Low-vision Clinic, The Iris Network
Robert Dreher, MD, FACS, Member, BMV Medical Advisory Board (1976-present)
Fred Miller, MD, Retired, Retinal Specialist, Maine Eye Center
Daniel Onion, MD, MPH, Chair, BMV Medical Advisory Board
Linda Schumacher-Feero, MD, President-Elect, Maine Society of Eye Physicians and Surgeons
Eric Bellavance, BMV Senior Section Manager (Medical Section & Driver's Education)
Thea Fickett, MPH, RN, BMV Medical Review Coordinator
Linda Grant, BMV Director of Driver's License Services, Chair, Low Vision Workgroup

III. Members with no position regarding use of BTLs to meet visual acuity standards:

Duane Brunell, Safety Performance Analysis Manager, DOT Safety Office
Brian Scott, Lieutenant., Commander of Traffic Safety and Legislative Liaison, Maine State Police

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Summary of Positions on the Use of BTLs to take Road Test

In Favor	14
Opposed	0
No Position	2

IV. Members in favor of allowing BTLs to for road test:

Eric Bellavance, BMV Senior Section Manager (Medical Section & Driver's Education)
A. Jan Berlin, MD, Medical Director, Low-vision Clinic, The Iris Network
Leonard Cole, Chair, The Iris Network Board of Directors
Robert Dreher, MD, FACS, Member, BMV Medical Advisory Board (1976-present)
Thea Fickett MPH, RN, BMV Medical Review Coordinator
Linda Grant, BMV Director of Driver's License Services, Chair, Low Vision Workgroup
Steve Kelley, CVRT, CRC, The Iris Network
Fred Miller, MD, Retired, Retinal Specialist, Maine Eye Center
Pat Monahan, Bioptic User, Vision Rehab Specialist, The Iris Network
Daniel Onion, MD, MPH, Chair, BMV Medical Advisory Board
Rene Paquin, Vision Specialist, Low Vision Associates of New England
Amanda Plourde, Certified Driving Instructor, CDRS, Adaptive Driving Associates
Linda Schumacher-Feero, MD, President-Elect, Maine Society of Eye Physicians and Surgeons
Diane Richard, Previous Bioptic Driver, Public Representative

V. Members opposed to allowing use of BTLs for road test:

None

VI. Members with no position regarding use of BTLs for road test:

Duane Brunell, Safety Performance Analysis Manager, DOT Safety Office
Brian Scott, Lieutenant, Commander of Traffic Safety and Legislative Liaison, Maine State Police

**Position Statement
Physician Subcommittee**

INTRODUCTION: As volunteer physicians interested in public safety and safe driving parameters for the visually impaired, we wish to consider what is best for the citizens of Maine, both the general public as well as those citizens who have reduced visual acuity. In so doing, we wish to approach this matter with as much data as possible derived from states that support and oppose the use of “biotopic telescopic lenses” (“BTLs”) for driving, national professional organization recommendations, and the literature published during the past three decades concerning this subject. Our position is derived from these findings and our combined professional experience.

FINDINGS:

- In reviewing the status of BTL use in twenty states furnished to the Work Group by the Maine Bureau of Motor Vehicles, we find no consistent standards for minimum visual acuity, BTL training, or BTL driver restrictions. In addition, state crash rates for this population are variable, from non-existent to widely divergent figures. (*Appendix D1*)
- An experiment with licensing low-vision drivers (those with visual acuity between 20/50 and 20/70) using BTLs in Maine from 1976-1982 resulted in an increased number of crashes and deaths. (*Appendix G 1*). These data led to termination of the trial. Although BTL training methods may have become more sophisticated, there still is no consensus about BTL training methodologies that improve driving performance and safety. (*Appendix E-3*)
- The BMV currently allows drivers with reduced visual acuity of 20/70 to drive with restrictions. The Bureau currently has no policy preventing such drivers from using BTLs to drive should they wish to do so, although current BMV rules prohibit the use of BTLs for any portion of driver’s licensing examination, including the road test. But, unlike the 1970s trial of BTL use in driving, no monitoring or studies of these drivers’ crash experiences have been done.

Appendix C: Positions of Working Group Members on Using Biotopic or Telescopic Lenses to Meet Vision Standards and Take Road Test

- As summarized by Owsley, no national or international studies have shown worse crash rates when allowing low-vision drivers, including truck drivers, to be licensed with visual acuity of 20/200 without using ancillary devices like BTLs. The last assessment of Maine drivers with 20/50 to 20/70 acuity was completed in 1998 for drivers who had their license restricted in the years 1989-1992. (*Appendix G*) This study of 526, mostly older drivers showed that after license restriction, the rate of accidents in this population declined in the range of 0.7 - 2.2% from a crash rate of 7.45% per year for the 4 years immediately prior to the license restriction. This compares with the National Highway Traffic Safety Administration's (NHTSA's) crash rate for all drivers of 6.78% in 1996.
- National organizations like the American Academy of Ophthalmology (AAO) have policy statements suggesting that liberalized acuity standards may be safe. (*Appendix L-2*)
- Several studies have found evidence of increased crash rates in users of BTLs up in the range of twice or higher than those of normal drivers. (*Appendix F-1*)

RECOMMENDATIONS:

- Continue to license low-vision drivers with visual acuity between 20/50 and 20/70 with the current restrictions. Today, individuals with 20/70 acuity must demonstrate this level of acuity in both eyes and this should be revised to 20/70 acuity in the better eye. Also, allow drivers with 20/100 correctable acuity, or better, in the better eye to drive with restrictions as recommended by the Medical Advisory Board.
- A 5-year retrospective study of licensed drivers and prospective monitoring/studies of these groups should be accomplished over several years and then intermittently to provide prudent oversight of the general public health and safety.
- Continue to allow the use of BTLs to drive and amend BMV rules to permit BTLs to be used to take a licensing road test, but not to pass a visual acuity test. Drivers wishing to use BTLs must have training as determined by the BMV.
- Devise a mechanism to identify drivers who are using BTLs at the time of motor vehicle crashes in order to determine whether such drivers have higher crash rates than the rest of the licensed driving population.

Appendix C: Positions of Working Group Members on Using Biotopic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Respectfully submitted by:

Daniel K. Onion, MD, MPH
Chair, BMV Medical Advisory Board

A. Jan Berlin, MD
Medical Director, Low-vision Clinic, The Iris Network

Frederick Miller, MD
Retinal specialist, retired, Maine Eye Center

Robert J. Dreher, MD, FACS
Member, BMV Medical Advisory Board (1975-current)

Linda Schumacher-Feero, MD
President-Elect, Maine Society of Eye Physicians and Surgeons (MSEPS)

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Position Statement of

Leonard Cole, Esq.
Chair, Board of Directors, The Iris Network

Use of BTL for Road Test

I agree with the Group's recommendation that use of a BTL be permitted for taking the driving test.

Use of BTL to Meet Visual Acuity Standards

I disagree with the majority's recommendation that use of a BTL not be permitted for taking the visual acuity test and would recommend that use of a BTL be permitted for such purpose.

It is fundamentally unfair for the State of Maine to deny an individual the right to drive when (a) there is no evidence that the individual presents a higher risk than is tolerated for other identifiable groups and (b) the individual can demonstrate the ability to drive safely. Based on the available data (appended to the Report), any increased risk of accidents stemming from use of BTLs is less than the increased risk that we tolerate for other groups of drivers, including individuals under the age of 24 and over the age of 80. The 2013 Owsley study (appended to the Report) clearly shows that many individuals can drive safely using a BTL. Therefore, Maine should permit use of a BTL for all testing related to driver's licensure.

Reduction in Visual Acuity Requirement

I agree with the Group's recommendation that the minimum visual acuity standard be reduced from 20/70 in each eye to 20/100 in one eye, to be effected by the edits to the Visual Acuity Profile indicated on the following page.

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

3.	Active impairment:		
	b. Mild	b. (3) Vision correctable to 20/60 in best eye; restricted to daytime operation within a 25 mile radius of residence (4)(3) Vision correctable to 20/70 in each eye <u>20/100 in best eye; restricted to daytime operation within a 25 mile radius of residence</u>	b. 1 year
	c. Moderate	c. Vision currently less than <u>20/70 in each eye</u> <u>20/100 in both eyes</u>	c. No driving
	d. Severe	d. Vision currently less than <u>20/70 in each eye</u> <u>20/100 in both eyes</u> without chance of recovery.	d. No driving

**Position Statement of
Steven Kelley, MA, CVRT, CRC
The Iris Network, 189 Park Ave, Portland, ME 04102**

I am submitting my report as an individual and professional working as a vision rehabilitation therapist in Maine. I hold a MA and national certification in Vision Rehabilitation, and a MA and national certification in Rehabilitation Counseling. This report may not reflect my employer's (The Iris Network) position on LD 564. My primary interest in this legislation is to enable citizens in Maine with moderate low vision similar access to driving licensure currently available in many other states, and the opportunity to use corrective lenses such as bioptics, to pass vision acuity tests needed for state licensure.

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

LD 564 was presented to the Maine State Legislature in an effort to provide greater and more egalitarian access to Maine roads for Maine citizens who may have moderate low vision, a visual acuity that ranges between 20/40 and 20/200. Many states permit licensure of drivers with a visual acuity in this range by: 1) establishing visual acuity standards that range between 20/40 and 20/200; 2) permitting the use of corrective lenses called 'bioptics' to be used to achieve the acuity requirements for licensure during an eye test.

Maine currently provides for licensure to individuals with a maximum 20/70 acuity in each eyes with restrictions to include daylight driving only within 25 miles of home, as stated in the *Maine Functional Ability Profile*. In this same document, item 2, under the heading *Visual Acuity* states:

Correction through the use of telescopic or bioptic lenses is not acceptable for purpose of meeting any of the visual acuity requirements nor may such lenses be used during any parts of the driver license examination process.

Currently, 46 states (including Maine) permit the use of bioptic lenses while driving a vehicle. Forty three expressly permit the use of bioptics in their statutes and 4 states, AR, NJ, and NH have unclear statutes but permit bioptics in practice. **Please note that prior to recent meetings of the Maine Medical Review Board it was commonly understood that Maine expressly prohibited the use of bioptic lenses for both driving and acuity testing.**

Currently 34 states (not including Maine) permit the use of bioptic lenses to meet vision acuity standards for licensure. Thirty one states expressly permit their use for testing in state statutes, and the states of AR, MD, and NH have unclear statutes but permit the use of bioptics to meet acuity standards for licensure in practice.

Currently 44 states permit licensure to drivers with vision acuity less than what is required for Maine licensure. This includes 13 states permitting licensure within an acuity range of 20/100-20/160; 15 states at 20/200; and 1 at 20/400.

Drivers from any of the 44 states with acuity standards less restrictive than Maine's may nonetheless drive legally on Maine roads. Drivers from another state using a bioptic lens to pass their state's driver's license acuity standards may also drive legally on Maine's roads.

Appendix C: Positions of Working Group Members on Using Biotopic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Although several studies are frequently cited as at least statistically relevant, it is generally agreed in the current literature, such as Owsley review of available research in 2012, that there is no definitive research demonstrating that drivers within the moderate low vision acuity range of 20/40-200 or that drivers using biotopic lenses for driving or to pass their state's vision acuity tests, have a higher crash rate than many other groups of drivers routinely licensed, "A paradox is that there is little to no evidence that persons with visual acuity worse than 20/40 are at increased risk for motor vehicle collision (MVC) involvement (Owsley, 2012).

Mr. Brunell's review appears to confirm that of the few studies available, biotopic driver crash rates appear to be double a control group. He mentions that reporting varies-- some studies report crashes per number of drivers longitudinally, others report crashes per miles driven. Mr. Brunelle described this crash rate as a, "significantly higher crash rate." If there is any statistical merit to these studies suggesting a crash rate for biotopic drivers to be double that of a control group of drivers, it may be useful, to put that crash rate in perspective with other groups of drivers routinely licensed. If in fact double, this crash rate is much better than the crash rates reported by the National Highway Safety Administration data for teens and drivers over 80. This data reports teen drivers to have crash/fatality rates 9 times greater than control, and elders 5.5 times greater (Dr. Onion pointed out that there may be reason to question the accuracy of the rates for elders). The Owsley review of the literature reported that similar crash results for biotopic drivers, in a "study in Texas found that the crash rate for biotopic drivers was very similar to that for drivers with cardiovascular or neurological conditions, conditions for which licensure is not often questioned." It is also worth noting that the three studies most often cited as indicating increased crash rates for drivers with biotopics, the CA, MA and NY studies, occurred in states which still permit driving with biotopic lenses decades after the studies were completed.

Currently no insurance companies identify drivers with moderate low vision or using biotopic lenses as a higher risk category warranting higher rates. However drivers between the ages of 16-23; over 75; business executives; and lawyers are designated as higher risks by insurance companies and may have to pay higher rates.

This report writer would ask the Maine Medical Review Board to consider changing the Maine *Functional Ability Profile* to reflect the research above through the following changes:

1. Amend *Visual Acuity, Profile 3* to broaden the acuity range to 20/50-20/150 in best corrected eye daylight only restriction; 20/60-20/160 daylight and geographic restriction; 20/200 in each eye daylight and geographic restriction.

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

2. *Change Section titled Visual Acuity, Item 2, to instead require that if correction is made through the use of a bioptic lens, the acuity must be greater than 20/40 through the bioptic and vision through the carrier lens corrected to 20/200 or better.*

Although none of the research reviewed suggested that daylight and geographic limitations provide an increase in safety, Maine statute under *Functional Ability Profile, Section Visual Acuity, Item 3*, provides for alterations of restrictions based on a combination of doctor's recommendation, supervisory driver examination, and/or review of driving records. These restrictions might be appealed on an individual basis.

The review of literature is also unclear as to whether or not additional training with the use of the bioptic lens has any correlation with crash rates, although the Owsley review did cite research demonstration that training increased the efficacy of certain task performance while using bioptics. The reduction of restrictions, both daylight and geographical for drivers in Maine could include a stipulation for specific training related to driving with moderate low vision, or the use of the bioptic while driving.

Currently, 12 states expressly require additional training to be granted licensure when using a bioptic lens to pass the vision acuity requirements or road test. Although unclear from descriptions it appears the cost for additional training and the bioptic lens is born by the individual seeking licensure in most states. It is also unclear how implementation of revised acuity standards and the use of a bioptic lens to pass vision acuity tests might impact accident statistics without corresponding implementation of a training requirement.

In summary, Maine routinely licenses driving demographics, such as teens and elders who consistently have greater collision and fatality rates than any of the historical research done on bioptic drivers. Insurance companies routinely charge higher rates to higher risk drivers. To date insurance companies do not identify drivers with moderate low vision, or those using bioptics as high risk drivers. Drivers with moderate low vision with or without bioptic lenses, with a valid driver's license from their home state, drive on Maine roads. It is time for Maine to acknowledge that the research to date does not warrant the continued prohibition of driving with moderate low vision and/or the use of bioptic corrective lenses for passing the driver acuity tests in the state of Maine.

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Position Statement

Pat Monahan, MA

**Certified Vision Rehabilitation Therapist, Bioptic User
The Iris Network, 45 Oak Street, Suite 1, Bangor, ME 04401
207-561-4022**

I am writing in support of persons with low vision to be allowed to wear bioptics while driving and during testing for a driver's license in Maine. I have both professional and personal experience which leads me to this decision.

First, on a professional level, I am trained to teach persons with vision loss activities of daily living. I received a Master's of Art degree from Western Michigan University in Rehabilitation Teaching, now called Vision Rehabilitation Therapy. I received my degree in 2003. I have been working for The Iris Network in this capacity since then. I have worked with persons in their home, community, and their workplace. The age range of my clients is wide, from 16 years of age to 103.

A very high percentage of the people I have worked with have functional vision. Therefore, very often optical aids and training can help the person achieve his/her goals. I have assisted persons in achieving goals such as: reading their mail, managing their finances, cooking, shopping, using their computer, etc. There are safety issues involved at times, such as when using a knife in the kitchen, and/or navigating stairs in the home. I am very involved with the low vision process which is the process a person goes through to acquire and use optical aids to achieve his/her goal. I prepare the person for the low vision exam, I go to the exam with my client, I do follow-up and training with the recommended aids to be sure they are working.

Because of my experience and training, I know there are persons who can drive safely, but they do not pass the visual requirements. The number of persons I am referring to is small, but the impact on their life is large. I am referring to a person who has no scotomas (blind spots), has at least 120 degrees with both eyes for field, and no worse than 20/200 acuities with best correction for both eyes. If a person such as this were fitted to bioptics, received training in using the bioptics, he/she would have the ability to drive safely, in regards to vision. The bioptic enhances the driving experience, if it is used effectively. If no bioptic is used, and the person has poor acuities, he/she may still drive safely because objects can be seen. However, that

January 2014

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

person would be at a great disadvantage because he/she may not have the ability to identify what is seen in the great distance. If one has bioptics and training, then these bioptics should be allowed for testing for licensure. That person with the bioptics would need to achieve the same acuity using the bioptics as the non bioptic driver. This is because the bioptics are merely an optical aid so the driver can see as well as the non bioptic driver. The training is important for safety reasons.

Personally, I am a person who was born with low vision and has never had a driver's license due to my vision. I also married a man who drove in the past, but has not driven now for 30 years due to vision loss. I am now 52 years old. The inability to acquire a driver's license has greatly impacted my life. I am limited to where I can live and work. I chose not to have children because I would not be able to drive them to appointments and activities. It was very difficult in high school watching my peers receive their driver's permit when I knew I would never have that opportunity. Also, at that time, I felt I could drive safely. I could see the road, people, cars, etc.

The research shows little conclusive evidence whether driving with bioptics is safe or not. Therefore, consulting with persons in this field of vision rehabilitation makes sense. I am referring to persons that work in the community with the person, as opposed to in a medical setting. The vision rehabilitation professional has a better understanding in regards to how a person learns to use an optical aid in order to achieve a goal, such as using bioptics to drive safely.

I know of 2 young girls, ages 18, in one of the poorest, rural counties in Maine. They are twins. They have the same eye condition as I do. They have never been anywhere, are very poor, and are expected, by their parents, to stay home to watch their younger siblings. If they were given the opportunity to drive, more doors could open for them. They may not be as restricted as to where they live, work, etc. This is just 2 persons within Maine that could greatly benefit from being given the opportunity to drive. When you meet these people and get to know them, it seems like an injustice to not provide them with the same opportunities as other's have.

Appendix C: Positions of Working Group Members on Using Bioptic or Telescopic Lenses to Meet Vision Standards and Take Road Test

Position Statement

**Rene Paquin, Low Vision Specialist
Low Vision Associates of New England**

I strongly favor bioptics for not only driving but for taking the road and eye tests. I think the law should allow people with low vision to utilize a bioptic and demonstrate 20/30 vision acuity through the bioptic and have no restrictions. If a person cannot attain 20/30 vision while using a bioptic then I believe they should be given the opportunity to demonstrate their ability to manage a motor vehicle. I truly believe that anyone who has so much vision loss that they cannot attain 20/30 will not even try to get a driver's license. There is a tipping point when a person with a visual impairment knows when something is not reasonable. This is a very complicated issue and it is not black and white.

Position Statement

**Amanda Plourde, COTA/L, CDI, CDRS
Portsmouth Ave Suite B201B, Stratham NH 03885,
Phone/Fax: (603) 778-2004**

I feel that licensure candidates should be able to wear their bioptic for the behind the wheel portion of the licensing exam and be able to use a snellen eye chart at the BMV for their vision screen, and/or at the very least provide a vision form from their eye care specialist documenting visual acuity. (or functional vision)

I added that driver training is recommended to reduce driver risk, can't be made mandatory, because it is at the cost of the licensee. I don't know if this is helpful and you could credit me as a resource, but I don't have a specific document to credit, other than the Physician's Guide to Assessing and Counseling Older Driver's provides a definition of what a Certified Driver rehabilitation Specialist is and how they can help with evaluation and driver training.

Position Statement

**Diane Richard, Previous Bioptic Driver
Public Representative**

Bioptic driving should be reintroduced into the State of Maine. Training should be required as well as careful monitoring of driving along with any changes in visual acuity.

Bioptics should be permitted for vision and road tests.



Appendix D:

Bureau of Motor Vehicles Administration of Low Vision Drivers

1. Administrative Rule 29-250 Chapter 3: Physical, Emotional, and Mental Competence to Operate a Motor Vehicle
2. Bureau of Motor Vehicles Memorandum about Bioptic Lenses
3. Study of Low Vision Accidents Before and After Medical Review

29 DEPARTMENT OF SECRETARY OF STATE**250 BUREAU OF MOTOR VEHICLES****Chapter 3: PHYSICAL, EMOTIONAL AND MENTAL COMPETENCE TO OPERATE A MOTOR VEHICLE**

SUMMARY: These rules describe the standards to be used by the Secretary of State in determining physical, emotional and mental competence of persons to operate motor vehicles. The rules establish a reporting system which requires persons to submit medical information to the Secretary of State. Persons found incompetent to operate a motor vehicle in accordance with procedures outlined in these rules may have their driving privileges suspended, revoked or restricted.

1. Standards

- A. Secretary of State. The Secretary of State shall determine the physical, emotional, and mental competence of a person to operate a motor vehicle with the advice of the Medical Advisory Board and on the basis of the Functional Ability Profiles.
- B. Functional Ability Profiles. Standards to determine the competence of a person to operate a motor vehicle are those contained in the "Functional Ability Profiles" adopted by the Secretary of State with the assistance of the Medical Advisory Board.

2. Reporting System

- A. Medical conditions requiring report. Conditions for which a person is required to submit a report to the Secretary of State include, but are not limited to, neurological, cardiovascular, metabolic, musculoskeletal, visual, emotional and psychiatric and substance abuse.
- B. Sources of information. Sources of information concerning medical conditions include, but are not limited to:
 - 1. Permits, licenses, renewal applications, and accident reports;
 - 2. Written reports from family, physicians, law enforcement personnel and other government agencies, and;
 - 3. Signed statements from citizens.

- C. Nature of medical report. Upon receipt of information concerning the existence of a medical condition for which a report is required or which may affect a person's ability to operate a motor vehicle, the Secretary of State shall request the person involved to submit a medical report from a physician or from other competent treatment personnel, who may be specified.
1. To be acceptable, the medical report must be made on forms supplied or approved by the Secretary of State and must contain the physician's or other treatment personnel's diagnosis of the patient's condition(s) and any prescribed medication(s).
 2. The Secretary of State may require an individual to certify in writing the date of the person's last seizure.
- D. Action by the Secretary of State
1. Upon receipt of a medical report indicating that a person is competent to operate a motor vehicle, the Secretary of State may approve the person's competence to operate a motor vehicle, with or without restrictions, taking into consideration the safety of the public and the welfare of the driver.
 2. Upon receipt of a medical report indicating that a person is not competent to operate a motor vehicle, or upon the failure or refusal of a person to submit the requested information, the Secretary of State shall follow one or more of the following procedures:
 - a. If, from records or other sufficient evidence, the Secretary of State has cause to believe that a person is not physically, emotionally, or mentally competent to operate a motor vehicle, the Secretary of State may:
 - i. Obtain the advice of any member of the Medical Advisory Board or the Board collectively. The Board or any member may formulate advice from the existing records and reports or may request that an examination and report be made by the Board or any other qualified person so designated. The licensed driver or applicant may present a written report from a physician of the person's choice to the Board or the member reviewing the matter and such report must be given due consideration. Members of the Board and other persons making examinations and reports are not liable for their opinions and recommendations pursuant to this subsection.

- ii. Require a person to submit to a driving evaluation. Upon the conclusion of such an evaluation, the Secretary of State shall take action as may be appropriate. The Secretary of State may suspend the license of such person, allow the person to retain a license, or issue a license subject to any conditions or restrictions deemed advisable, having in mind the safety of the public and the person.
 - iii. After hearing, suspend any certificate of registration, operator's license, operating privileges, or privilege to apply for and obtain a license in the State of Maine.
 - iv. Without preliminary hearing, suspend any certificate of registration or any operator's license, operating privilege, or privilege to apply for and obtain a license in the State of Maine if the Secretary of State determines that the person's continued operation of a motor vehicle presents a potential danger to the person or other persons or property. The Secretary of State shall notify the person that a hearing will be provided without undue delay.
- E. Confidentiality of reports. Reports received under this rule are confidential in accordance with the Maine Motor Vehicle Statutes.

FUNCTIONAL ABILITY PROFILES

Functional ability to operate a vehicle safely may be affected by a wide range of physical, mental or emotional impairments. To simplify reporting and to make possible a comparison of relative risks and limitations, the Medical Advisory Board has developed Functional Ability Profiles for ten categories, with multiple levels under each profile. Each profile follows the same format:

1. **No diagnosed condition.** This section is used for a patient who has indicated to the Bureau of Motor Vehicles a problem for which no evidence is found, or for which no ongoing condition can be identified. For example, this category might apply to a person with a heart murmur as a young child who indicates heart trouble, or to a teenager who fainted in gym class once on a hot day who indicates blackouts.
2. **Condition, fully recovered/compensated.** This category indicates a history of a condition which has been resolved or which does not warrant review. Guidance for the use of this section is given in each profile.

3. **Active impairment.**
 - a. **Minimal.** This section may call for periodic review because of an ongoing condition which could deteriorate.
 - b. **Mild.** This section deals with conditions which may impair driving but which are controlled so that a person can still operate a motor vehicle safely. Reviews are more frequent than in (a).
 - c. **Moderate.** This section identifies impairment which often precludes driving, but for which there is the potential for recovery to the point of allowing safe operation of a motor vehicle.
 - d. **Severe.** This section identifies permanent conditions with little or no potential for improvement and which preclude safe operation of a motor vehicle.
4. **Condition under investigation.** This section is for newly identified conditions. Follow-up reports will place condition in its proper part of section 3.

In all cases, periodic reviews may place the driver being evaluated in a higher or lower section as the condition improves or deteriorates.

.....
(PAGES 5-29 OMITTED)
.....

VISUAL DISORDERS

The main elements of vision necessary for safe driving are visual acuity, peripheral vision and freedom from double vision (diplopia) These three items are elaborated in the following charts on visual parameters. Other, not so easily measured visual factors, are discussed below:

Defects in color vision, important in distinguishing traffic signals, are usually compensated for by learning traffic light positions and are not in themselves reasons to deny driving but will usually have been tested adequately by the road evaluation.

Night vision and glare recovery may be impaired in the presence of corneal scars, cataracts, and retinal disease.

Dynamic visual acuity (acuity measured when there is movement of a driver or object) and speed blur are important to keep in mind since speed and motion appear to decrease acuity and peripheral vision.

Physician judgment and counseling of the driver as well as recommendations to the driver examiner to look for problems caused by the above defects will be helpful in identifying drivers whose visual disorders may be a hazard even though it cannot be measured by standard visual tests.

FUNCTIONAL ABILITY PROFILE: Visual Disorders
Double Vision

Profile Levels	Circumstances*	Condition Example	Interval for Review
1.	No diagnosed condition	Never sees double	
2.	Condition fully recovered & compensated	Past history of diplopia which has recovered	Per Recommendation
3.	Active impairment:		
	a. Minimal	a. Eyes crossed but no diplopia without patch.	a. N/A
	b. Mild	b. Intermittent diplopia or constant double vision correctable by patching one eye.	b. 4 years
	c. Moderate	c. Monocular diplopia in only eye meeting visual acuity standards with potential for correction.	c. No driving
	d. Severe	d. Monocular diplopia in only eye meeting visual acuity standards without potential for correction	d. No driving
4.	Condition under investigation	Recent onset of diplopia.	As needed

* For further explanation refer to page 1

**FUNCTIONAL ABILITY PROFILE:
Peripheral Vision**

Profile Levels	Circumstances*	Condition Example	Interval for Review
1.	No known impairment.	Binocular visual field of at least 150° measured with a 10mm white test object at 330mm, without corrective lenses, in the horizontal meridian.	
2.	Condition fully recovered & compensated	Past history of visual field defect but currently 150° or more.	N/A
3.	Active impairment:		
	a. Minimal	a. Binocular or monocular visual field of 140° or better.	a. 4 years
	b. Mild	b. Binocular or monocular visual field of 140° or better with potential for deterioration.	b. 1 year
	c. Moderate	c. Peripheral vision of less than 140° but at least 110° Restricted to right and left outside mirrors.	c. No driving
	d. Severe	d. Permanent visual field of less than 110°	d. No driving
4.	Condition under investigation	Recent onset of visual field loss.	As needed

* For further explanation refer to page 1

**FUNCTIONAL ABILITY PROFILE:
Visual Acuity**

Profile Levels	Circumstances*	Condition Example	Interval for Review
1.	No known impairment ²	Sees 20/40 or better in best eye without correction	Standard ¹
2.	Condition fully recovered & compensated ²	Visual acuity correctable to 20/40 or better in best eye	Standard
3.	Active impairment ² : a. Minimal b. Mild c. Moderate d. Severe	a. Vision correctable by lenses in best eye to 20/40 or better at distance. b. (1) Vision correctable to 20/40 in best eye but could deteriorate soon due to glaucoma, diabetic retinopathy, etc. (2) Vision correctable to 20/50 in best eye; restricted to daytime operation only ³ . (3) Vision correctable to 20/60 in best eye; restricted to daytime operation within a 25 mile radius of residence ³ (4) Vision correctable to 20/70 in each eye; restricted to daytime operation within a 25 mile radius of residence ³ c. Vision currently less than 20/70 in each eye d. Vision currently less than 20/70 in each eye without chance of recovery.	a. Standard b. 1 year c. No driving d. No driving
4.	Condition under investigation	Newly reported change in visual acuity.	As needed

^{1,2,3} See footnotes on page 28

* For further explanation refer to page 1

FUNCTIONAL ABILITY PROFILE: Visual Disorders
Visual Acuity

VISUAL ACUITY

1. Standard means visual test at the license renewal periods established by the Motor Vehicle statutes.
 2. Correction through the use of telescopic or bioptic lenses is not acceptable for purposes of meeting any of the visual acuity requirements nor may such lenses be used during any phase of the driver license examination process.
 3. The daytime only and/or geographic restriction(s) may be reduced or enlarged on the basis of:
 - a. a recommendation from an optometrist or ophthalmologist advising that the individual's vision is adequate to permit the safe operation of a motor vehicle; and
 - b. a supervisory driver's examination that demonstrates the individual's ability to operate a motor vehicle safely; and
 - c. a review of the individual's driving record shows the ability to operate a motor vehicle safely and in accordance with all applicable laws, rules, and regulations governing the operation of motor vehicles.
-

STATUTORY AUTHORITY: 29 M.R.S.A. Sec. 51

EFFECTIVE DATE:

May 7, 1979

AMENDED:

March 24, 1986

October 11, 1986

September 11, 1988 (Page 28 & 29)

October 17, 1989

May 24, 1992 - Page 27

October 18, 1994

May 28, 1995

EFFECTIVE DATE (ELECTRONIC CONVERSION):

May 4, 1996

NON-SUBSTANTIVE CORRECTIONS:

December 14, 2000 - converted to MS Word, formatting

www.maine.gov/sos/cec/rules/29/250/250c003.doc

Bureau of Motor Vehicles

Legal Affairs, Adjudications & Hearings

To: Patty Morneau, Deputy Secretary of State
From: Robert O'Connell, Jr., Director, Legal Affairs, Adjudications and Hearings
Date: February 25, 2013
RE: L.D. 564 "Resolve, To Allow Maine Drivers To Use Biotopic or Telescopic Spectacles When Driving Class C Motor Vehicles and When Testing for a Class C Driver's License"

This resolve directs the Bureau of Motor Vehicles (BMV) to amend its rule governing the physical, emotional and mental competence of persons to operate motor vehicles relating to the vision standards a person must meet to qualify for a driver's license by requiring BMV to remove the prohibition on the use of biotopic telescopic lenses (BTL) to satisfy the minimum visual acuity requirements for licensure and during any phase of the driver license examination process. The rule, adopted after careful deliberation, study, experience with BTL users and on the advice of the Medical Advisory Board (MAB) to the Secretary of State, provides that "[c]orrection through the use of...biotopic lenses is not acceptable for purposes of meeting any of the visual acuity requirements nor may such lenses be used during any phase of the driver license examination process."¹ The regulatory proscription on the use of BTL is based on the determination that the devices are incompatible with the safe operation of a motor vehicle because of the inherent optical limitations of the BTL, which cannot be eliminated or mitigated by user training.

A BTL is a miniature telescope that is mounted above or below the normal line of sight of the carrier lenses (traditional eye glasses or spectacles) and is designed to allow the user to spot and identify more clearly objects through the increased magnification provided by the telescope. The BTL was originally developed by William Feinbloom, a New York Optometrist, in 1932 to assist his low vision patients. In 1958, Feinbloom suggested that BTL could be employed by low vision persons to operate motor vehicles. In the 1970s, states began to issue driver's licenses to persons who used BTL to satisfy the minimum visual acuity requirements, which by that time had become a routine standardized pre-condition to licensure (It is important to note that while BTL were used by the person to meet the state's minimum visual acuity standards, the devices, which are designed for spotting and identifying objects such as signs, traffic control signals and scanning ahead for potential hazards, are used only five percent of the time the BTL user is driving. That means the BTL driver is processing visual information through the carrier lenses with a diminished visual acuity outside the minimum required, but for the BTL, ninety-five percent of the time the person is operating the motor vehicle. Furthermore,

¹ 29-250 C.M.R. ch. 3 Functional Ability Profile: Visual Acuity (2000).

when looking through the BTL, the driver's field of vision is dramatically reduced to, at most, twenty degrees). In 1976, five years after California purportedly licensed the first BTL user, the Maine Division of Motor Vehicles, now BMV, began to license drivers who used BTL to meet the minimum visual acuity requirements and to pass the driver's license examination based on a few early non-scientific and empirically unsound studies and articles that suggested the use of BTL by drivers was compatible with safe driving. However, in the late 1970s and early 1980s, a number of articles were published that indicated that the use of BTL by drivers was not consistent with the safe operation of a motor vehicle.²

The safety concerns regarding BTL use while driving led the BMV to establish a task force on the use of BTL while driving, comprised of BMV representatives and vision care specialists in 1980. The BMV subsequently adopted the task force recommendation to establish minimum visual acuity standards for BTL users. On February 24, 1982, the BMV adopted a recommendation of the "Bioptic Lense Review Committee," created to develop further BMV policy concerning the licensure of BTL users, not to grant new driver's licenses to BTL users pending a review of safety issues and the establishment of a training program for such users. This "moratorium" on the licensure of BTL users continued until July 11, 1985 when the BMV adopted a policy allowing the licensing of BTL users whose visual acuity measured at least 20/70 in both eyes through the carrier lenses and at least 20/40 through the BTL in both eyes. This policy, with changes recommended by the vision sub-committee of the MAB, was adopted as a rule, effective October 11, 1986. The rule authorized the restricted licensure of BTL users whose visual acuity measured at least 20/70 in each eye, at least 20/40 through the BTL in one eye and a binocular field of vision of 130 degrees through the carrier lenses.³ In addition, the rule required that the BTL user's license be restricted to daylight operation within a designated geographic areas as determined by a driver evaluation. The imposition of the temporal and geographic restrictions on existing BTL users, who had been previously licensed, resulted in legal action filed by some of those drivers. Both the Maine Human Rights Commission and the Maine Law Court dismissed the BTL users complaints on jurisdictional and procedural grounds, respectively.⁴

While the BMV was developing and revising its policy, a number of articles and studies were published or became available which demonstrated that the accident rates of BTL user drivers were 1.8 to 2.8 higher than the accident rate of non-BTL drivers. An unpublished 1979 study found that the normalized (age and sex adjusted) accident rate of 108 California licensed BTL users was 1.8 times the rate of a comparison group of non-BTL users.⁵ An unpublished

² See, Keeney, Weiss & Silva, *Functional Problems of Telescopic Spectacles in the Driving Task*, 72 TR. AM. OPTH. SOC'Y 132 (1974) (identifying five optical limitations in the BTL including size distortion-nearness illusion, a large ring scotoma dramatically reducing visual field, and resolution decay resulting from vehicle vibration); Fonda, *A Bioptic Telescopic Spectacle: Advantages and Limitations*, 48 SIGHTSEEING REV. 125 (1978) (concluding that the small magnified area of seven degrees through the BTL and the ring scotoma limiting the visual field to twelve degrees make the use of the device while driving hazardous); Fonda, *Bioptic Telescopic Spectacle is a Hazard for Operating a Motor Vehicle*, 101 ARCH. OPTH. 1907 (1983) (reiterating previous conclusion that the use of BTL while driving is hazardous).

³ 29-250 C.M.R. ch. 3 Functional Ability Profile: Visual Acuity (1986) (Repealed)

⁴ *Gross et al v. Secretary of State*, 562 A.2d 667 91989) (dismissing original complaint of BTL users based on repeal of the 1986 rule).

⁵ See Janke & Kazarian, *The Accident Record of Drivers with Bioptic Telescopic Lenses*, CAL. DMV. RSS 83-86, 2 (1983).

1980 study of New York licensed BTL users found the accident rate of 68 BTL users was 2.8 the rate of non-BTL users.⁶ In 1983, an updated study of 229 California licensed BTL users found the accident rate of 229 BTL users, adjusted for age and sex, was 1.5 times the rate of a comparison group of non-BTL drivers.⁷ The authors of the 1983 California study note that the accident rate of BTL users would be more than 1.5 times the comparison group's rate if normalized for mileage. A 1983 unpublished BMV study found the accident rate of 14 licensed BTL users, adjusted for mileage, was 1.8 times the rate of non-BTL licensees.⁸ The author of the Maine study observed that one of the licensed BTL users with four accidents during the review period was excluded from the study because of failure to return the survey questionnaire and was subsequently involved in a double fatal accident on January 14, 1983. It should also be noted that an analysis of the accident reports of the Maine licensed BTL users revealed that all the accidents were caused by the BTL users' failure to observe other traffic. In addition, the American Association of Motor Vehicle Administrators, the American Medical Association, Committee on Optics and Visual Physiology, American Academy of Ophthalmology and the United States Highway Traffic Safety Administration had adopted positions against the licensing of BTL users who were unable to meet state visual acuity standards without the BTL.

In view of the additional information outlined above concerning the safety risks associated with the use of BTL to qualify for a driver's license and to operate a motor vehicle, the BMV adopted the current rule on September 5, 1988 prohibiting the use of BTL to qualify for a Maine driver's license, which was unanimously approved by the MAB. At the rulemaking hearing on August 23, 1988 Arthur Keeney, a nationally recognized expert on low vision and the use of BTL while driving, testified to twelve inherent optical limitations to using a BTL to qualify for a license or to use while driving (ten such limitations are listed on the attachment entitled Bioptic Hazards). Subsequent studies of the accident rates of licensed BTL users in Texas, Illinois and California continue to demonstrate that the accident rate of BTL users exceeds those of non-BTL drivers. A 1988 study of 64 license BTL users in Texas showed their accident rate was 1.3 times the rate of a random control group of non-BTL drivers.⁹ A study of licensed Illinois BTL users showed their accident rate 1.2 the rate of non-BTL drivers.¹⁰ The most significant study is the analysis of the accident rates of licensed BTL users in California published in 1996. The study is especially significant because of California's long history of licensing drivers who use the BTL and the relatively large number of such drivers which allows for the review of the records of many more licensed BTL users than the populations examined in other studies. This study found that the adjusted (age and sex) total accident and fatal accident rate for the 609 licensed BTL users was 1.9 and 1.7 the rate, respectively, of non-BTL drivers (unadjusted rates were 2.2 and 2.3 respectively), but when only non-BTL drivers with valid licenses, adjusted for age and sex were included in the comparison group, the accident rates of license BTL users was 2.2 and 2.3 times, respectively, the rate of non-BTL drivers with valid licenses.¹¹ The author of this study notes that California's attempts to reduce the accident rates

⁶ Bostick, *Past and Future for Telescopic Lens Users* (1980).

⁷ Janke & Kazarian, *The Accident Record of Drivers with Bioptic Telescopic Lenses*, CAL. DMV. RSS 83-86 (1983)

⁸ Burke, *Study: Bioptic Lens Drivers 1976-1983* (1983).

⁹ Lippmann, Corn & Lewis, *Bioptic Telescopic Spectacles and Driving Performance: A Study in Texas*, 82 VIS. IMPAIR. BLIND 182 (1988).

¹⁰ Taylor, *Telescopic Spectacles for Driving: User Data Satisfaction, Preferences and Effects in Vocational, Educational and Personal Tasks: A Study in Illinois*, 4 J. VIS. REHABIL. 29 (1990).

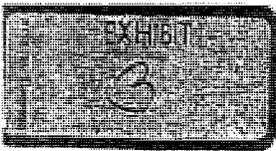
¹¹ Clarke, *An Evaluation of the Traffic Safety Risk of Bioptic Telescopic Lens Drivers*, CAL. DMV. RSS 96-163 (1996).

of licensed BTL users through license restrictions have been unsuccessful and recommends the state revisit the issue whether drivers with uncorrectable substandard vision should even be licensed.

In addition to the studies demonstrating the relative higher accident rates of licensed BTL users, every appellate judicial decision of which I'm aware, has upheld the prohibition on the use of BTL to satisfy a state's minimum visual acuity requirement and to otherwise use the devices to qualify for a driver's license for safety reasons, irrespective of the Federal Rehabilitation Act and Americans With Disability Act. These decisions include *Commonwealth of Pennsylvania, Department of Transportation, Bureau of Traffic Safety v. Sara Marie Liberati*, 472 A.2d 741 (1984) (upholding the proscription on the use of BTL to qualify for a driver's license as a legitimate, rational regulation promoting driver safety and not violative of the Federal Rehabilitation Act.); *Sharon v. Larson*, 650 F. Supp. 1396 (E.D. Pa.) (1986) (sustaining the prohibition on the use of BTL to qualify for a driver's license as not a violation of the Federal Rehabilitation Act because the inherent optical limitations of the devices render them unsafe for driver use as established by the California (1983), New York and Maine studies); *Gooch v. Iowa Department of Transportation*, 398 N.W. 2d 845 (1987) (upholding Iowa's ban on the use of BTL to qualify for a driver's license because of substantial evidence supporting the finding that the devices are unsafe for operating motor vehicles); and *Sklar v. Commonwealth of Pennsylvania, Department of Transportation, Bureau of Driver Licensing*, 764 A.2d 632 (1999) (driver's failure to meet state's visual acuity requirement without the use of BTL as required by regulation found not to be a violation of the Americans With Disabilities Act).

Finally, it may be more appropriate, should the Committee deem it advisable to authorize the use of BTL to satisfy the minimum visual acuity requirements and to use the device during the driver license examination, to simply enact a statutory provision to that effect.

cc: Donna Grant
Garry Hinkley
David Guilmette
David Lachance
Rick Desjardins



BIOPTICS HAZARDS

1. Because the bioptic telescopes magnify images, objects viewed through them appear much closer than they actually are. This phenomenon is known as "nearness illusion." For example, in the case of 3X telescope, ~~images are magnified three times their actual size and, consequently, appear three times closer than they actually are.~~

2. Images seen through the telescope move rapidly in the opposite direction of any head movement. The speed of movement in the opposite direction increases as the magnification power of the telescopes increases.

3. The visual field obtained when looking through the telescopes is extremely small.

4. Surrounding the small magnified visual field through the telescopes is a large donut shaped scotoma (completely blind area) which is at least two and perhaps three times larger than magnified visual field. An illustration of the size of the scotoma in relation to the visual field is provided in Exhibit 3 to Respondent's Memorandum. When looking at a distance of 200 feet, the area seen through the telescope was approximately 24 feet in diameter and on each side of the field seen through the telescope was a totally obscured area approximately 42 feet (84 total) in diameter. The donut shaped scotoma completely blocks vision and causes illusions as objects appear from and disappear into the blind area.

5. The ability to resolve images seen through telescopic lenses is decreased because of vibration. The problems of vibration are particularly acute when driving an automobile. The effect of vibration is magnified in proportion to the magnification level of the telescope.

6. Visual contact with images is interrupted while a wearer of bioptic telescopes switches his eyes from the carrier lenses to the telescopic-lenses and vice versa.

7. The bulky nature of bioptic telescopes, and the positioning of the head required to peer through the telescopic lenses results in fatigue.

8. The use of rear view mirrors is extremely difficult, if not impossible, when looking through the telescopic lenses.

9. The bioptic telescopes are practically of no use in city driving.

10. Depth perception is destroyed when looking through the telescopic lenses because of the magnification effect. In addition, the speed of a vehicle causes a blurring of images seen through the telescopes.





**Drivers with 20/50, 20/60, and 20/70 Visual
Acuity: A Single Group Comparison of
Accidents 4 Years Before and 4 Years After
Medical Review**

Prepared by
Richard D. Nickless
Management Analyst II

For
Robert E. O'Connell
Director, Driver Licensing and Control
Bureau of Motor Vehicles

October 30, 1998

**Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review**

Preliminary Research Report to the Medical Advisory Board

Policy Intervention

By legislative mandate, the Department of Secretary of State, Bureau of Motor Vehicles (BMV) is responsible for setting visual acuity standards for drivers and establishing a vision-screening program to improve safety and driving efficiency and, in particular, to reduce accidents, injuries, and deaths. With advice from a Medical Advisory Board, Maine's current visual acuity standards are the basis for determining whether or not a person will obtain a driver's license and what driving restrictions, if any, will be placed on a license.

The principle of vision screening is to identify those who need further testing or who should not be licensed, but with the minimum number of tests. Persons unable to meet a 20/40 standard of static acuity, after mandatory testing for driver's license renewal, are referred for medical review to either an optometrist or ophthalmologist. If the doctor reports that acuity is between 20/40 and 20/70, restrictions are placed on the license; if below 20/70 the license is denied. Obviously, a relationship exists between vision and driving safely, but the variation in visual acuity standards among states, together with the absence of studies establishing a relationship between the variables of visual acuity, license restrictions, and accidents, have led to charges that existing standards are arbitrary, bearing no rational relationship to safe driving.

Research Hypothesis

The following research hypothesis is a measure of outcome of the medical review process: the proposed relationship between a driver's visual acuity, subsequent license restrictions, and the frequency of accident-involvement over time. It is hypothesized that drivers with low static visual acuity are involved in a greater number of accidents before medical review than after medical review. It is further hypothesized that after medical review, accidents among low-vision drivers will decrease due to subsequently imposed driver's license restrictions.

Variable Definition and Measurement

The dependent variable is accident frequency defined as the number of reported crashes by law enforcement officials statewide and recorded by the (BMV) on individual driver histories. The independent variables are static visual acuity of 20/50, 20/60, and 20/70; and driver's license restrictions defined as AB, AG, and ABG (see Figure 5 below). The measurement period of driving history is four years before and four years after medical review. The duration of time before medical review is important because visual acuity changes gradually over time and therefore, it is more likely that a person's acuity dropped below 20/40 during a 4 year period as opposed to a shorter measurement period.

Population Characteristics

On September 29, 1995, a group of 2,673 drivers was drawn from the BMV database (over 300,000 licensed drivers) by AB, ABG, and AG license restrictions. This identified group represents all possible licensed drivers, with corrective lenses, that have been through a process of medical review for various medical reasons including vision. From this group, a population of 733 drivers were identified as being reviewed for only visual acuity during 1989, 1990, 1991, and 1992. The remaining 1,940 subjects were not selected from the overall population for the following reasons: first, the restrictions were imposed for other medical reasons; second, the restrictions were imposed either before 1989 or after 1992; third, the driver's license expired in 1993 or before not providing enough history; and fourth, the record could not be found.

**Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review**

Sample Characteristics

Figure 1 shows the sample size ($n=526$) of low-vision drivers. From a population of 733 drivers, 207 persons are removed for the following reasons: the review year¹ is either before 1989 or after 1992 ($n=31$); there is not enough driver history² either before or after review ($n=93$); an extraneous variable³ (other medical condition) occurred during the measurement period ($n=68$); and, vision improved⁴ to 20/40 or above during the measurement period ($n=15$).

Figure 1: Sample of Drivers Medically Reviewed due to Low Visual Acuity

Population (1989, 1990, 1991, 1992)	733
Review Year ¹	-31
Driver History ²	-93
Extraneous Variable ³	-68
Improved Vision ⁴	-15
Low-vision Sample Size	($n=526$)

Figure 2 shows that the sample consists of 40% males and 60% females. In Figure 3, the mean age of the sample is 85.

Figure 2: Low-vision Sample by Gender

Gender	Driver Frequency	Percent	Cumulative Percent
Male	213	40.5%	40.5%
Female	313	59.5%	100.0%
Total Cases ($n=526$)		100.0%	

Figure 3: Low-vision Sample by Age

Age Ranges	Driver Frequency	Percent	Cumulative Percent
31 to 50	7	1.3%	1.3%
51 to 70	15	2.8%	4.1%
71 to 80	104	19.8%	23.9%
81 to 90	273	51.9%	75.8%
91 to 100	124	23.6%	99.4%
101 to 106	3	0.6%	100.0%
Total Cases ($n=526$)		100.0%	

Figure 4 shows the number of low-vision drivers by license status. In Figure 5, the level of static visual acuity has been recaptured from medical reports, and license restriction codes are taken directly from each driver's history.

Figure 4: Low-vision Sample by License Status

License Status	Driver Frequency	Percent	Cumulative Percent
Active	406	77.2%	77.2%
Suspended	62	11.8%	89.0%
Deceased	54	10.3%	99.3%
Voluntary Surrender	4	0.7%	100.0%
Total Cases ($n=526$)		100.0%	

**Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review**

Figure 5: Low-vision Sample by Visual Acuity

Visual Acuity	License Codes*	Drivers by Group	Percent	Cumulative Percent
20/50	A&B	371	70.5%	70.5%
20/60	AB&G	142	27.0%	97.5%
20/70	AB&G	13	2.5%	100.0%
Total Cases (n= 526)			100.0%	

- * Code A means restricted to corrective lenses.
- * Code B means restricted to daytime operation.
- * Code G means restricted to a 25 mile radius of home.

Research Design

The research assesses the outcome of the medical review process by examining the difference between pre and post review accidents before and after initial medical review. Figure 6 shows a simple interrupted time-series design, where (O) stands for observations, and (X) for a treatment; the intervention of the medical review process. Best visual acuity was determined and license restrictions were imposed for each of the 526 drivers as a result of the intervention. Individual driving records provide the source for recapturing the number of accidents four years before (X) and four years after (X).

Figure 6: Research Design

Simple Interrupted Time Series Design			
Medically Reviewed Drivers (n=526)	Pre-review Accidents (4yr. period)	Intervention or Treatment	Post-review Accidents (4yr. period)
	O ₁ O ₂ O ₃ O ₄	X	O ₅ O ₆ O ₇ O ₈

Research Results

For analysis of data shown in Figure 7 below, the chi square (χ^2) test of proportion is used to assess statistical significance of the difference between observed and expected accident frequency within the sample group. These data show an observed pre-review accident frequency (f_o) of 156 and an observed post-review accident frequency (f_o) of 109 for a total of 265 accidents during the eight year measurement period. The expected frequency (f_e) for both pre and post review accidents is 132.5 (.5 x 265). There is a **significant difference** between observed and expected accident frequency in the expected direction at the .01 (α) level of probability. In other words, there is marked improvement in driving performance as shown by the significant decrease in the number of accidents subsequent to medical-review.

**Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review**

Figure 7 : Accident Frequency

Pretest-Posttest Accident Frequency by Year (n=526)				
Review Year	Crash-Free Drivers	Crash-Involved Drivers	Pre-Review Accidents (4yr. period)	Post-Review Accidents (4yr. period)
1989	23	16	15	12
1990	180	75	66	43
1991	128	71	63	45
1992	22	11	12	9
Total	353	173	156	*109

* Post-review accidents significantly less ($p < .01$)

Research Conclusions

These results are similar to findings of (Popkin, et al., 1983) who also made within-group comparisons to determine if medically impaired driver's crash rates changed from a two year pre to post evaluation period. The authors state that, "persons with visual, cardiovascular, mental, blackout and seizure disabilities showed a significant improvement in their crash rates". Similarly, these findings show a significant change in the desired direction within the target population that is very encouraging. However, the single group research design has its limitations or threats to internal validity. Given a mean age of 85, research has shown that the aging process including cognitive functioning, mobility, elderly driving habits, self-imposed driving restrictions, miles driven, and gender are potential confounding or extraneous variables. By developing a matched comparison group, it is possible to control for extraneous variables that could plausibly explain the observed change in accident frequency. Clearly, the degree to which threats to internal validity are controlled depends on the comparability of the two nonequivalent groups.

It is notable that there are substantial within-group individual differences in the number of crash-involved versus crash-free drivers as shown in Figure 7. As (Ball, et al., 1994) state in their research, "these data imply that current visual screening techniques, such as tests of acuity and peripheral vision as used at driver licensing sites (and required by Maine statute), are not adequate in identifying which older drivers are likely to be involved in crashes."

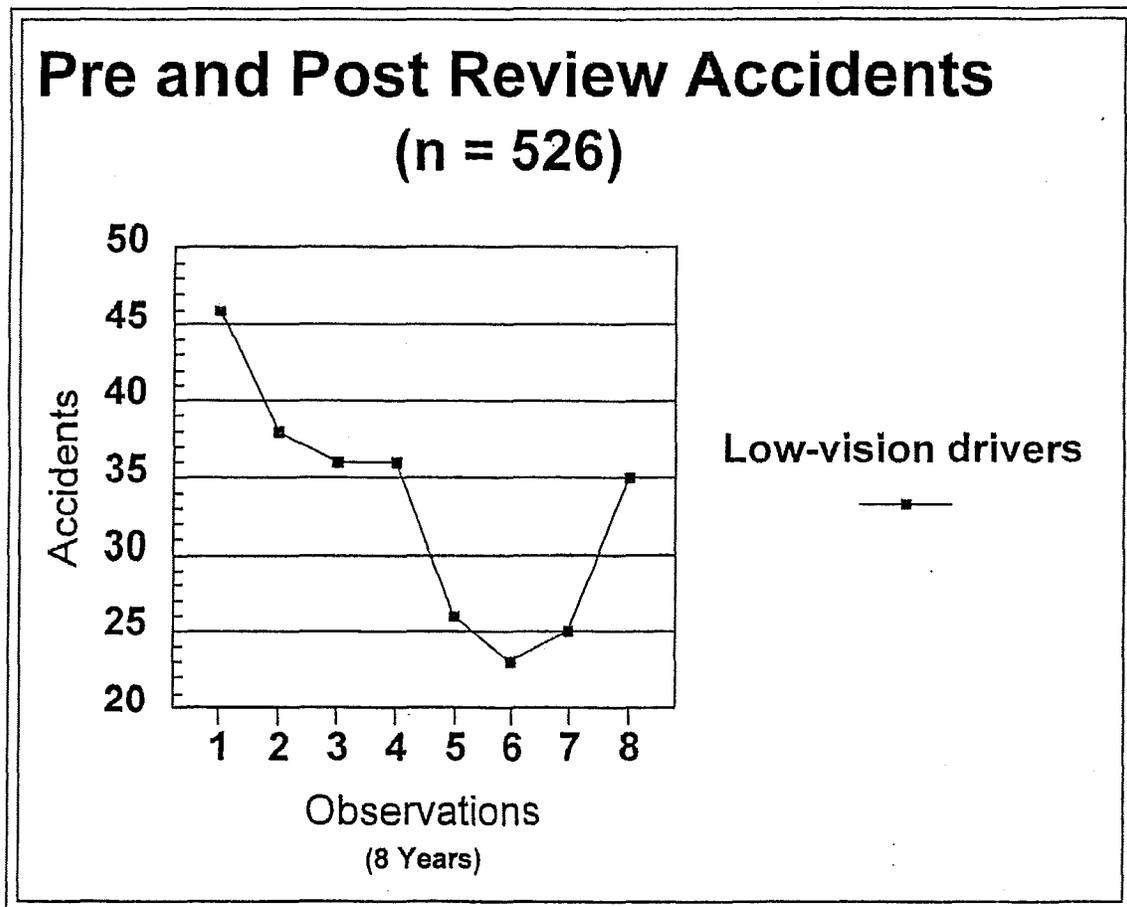
By random selection from a population of all licensed drivers, it is possible to create an existing "matched control" group. According to (Rossi and Freeman, 1989), "the aim of all such selection processes is to identify a group of unexposed targets (drivers with visual acuity above 20/40) that resemble as closely as possible the exposed targets (drivers with visual acuity below 20/40) in the medically-reviewed group." The next stage of the research will use a multiple time series design as a model of proof for testing proposed hypotheses regarding the differences in accident and conviction rates between an experimental and matched control group. "This design contains within it the nonequivalent control group, but gains in certainty of interpretation from the multiple measures plotted, as the experimental effect is in a sense twice demonstrated, once against the control and once against pre-X values in its own series," (Campbell & Stanley, 1963). It will be used to assess the outcome of the medical-review process by comparing accidents over a eight year period of time.

A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review

Chart 1 below shows an eight year trend line of pre and post review accidents among low-vision drivers. Observations 1,2,3, and 4 represent the four years of accident history prior to medical review and observations 5,6,7, and 8 represent the four years after medical review. Refer to Figure 6 above to see that the point of intervention or treatment effect is between observations 4 and 5, where an obvious and significant drop in the accident trend line is shown. After initial review, each driver should be reviewed annually at observation points 5,6,7, and 8. One plausible explanation for the continued increase in accidents from observation 7 to 8 is that 58% of the sample have only one medical report in their file; they completed the initial review process and did not have any subsequent follow-ups during the four year period. Another 30% of low-vision drivers had one follow-up report in their file during the same period. This is one unexpected outcome of the research which would have gone unchecked, but has since been corrected by putting the appropriate steps in place to improve the process.

By review years 1989, 1990, 1991, and 1992, Charts 2 through 5 illustrate the relationship between accidents four years before and four years after initial intervention (also see Figure 7). Chart 6 compares total pre (156) and post (109) review accidents that occurred during this eight year period of driver history which is a significant difference in accident frequency in the expected direction at the .01 (α) level of probability. This overall trend represents a marked improvement in the driving performance of low-vision drivers as shown by the significant decrease in the number of accidents subsequent to medical-review.

Chart 1



Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review

Chart 2

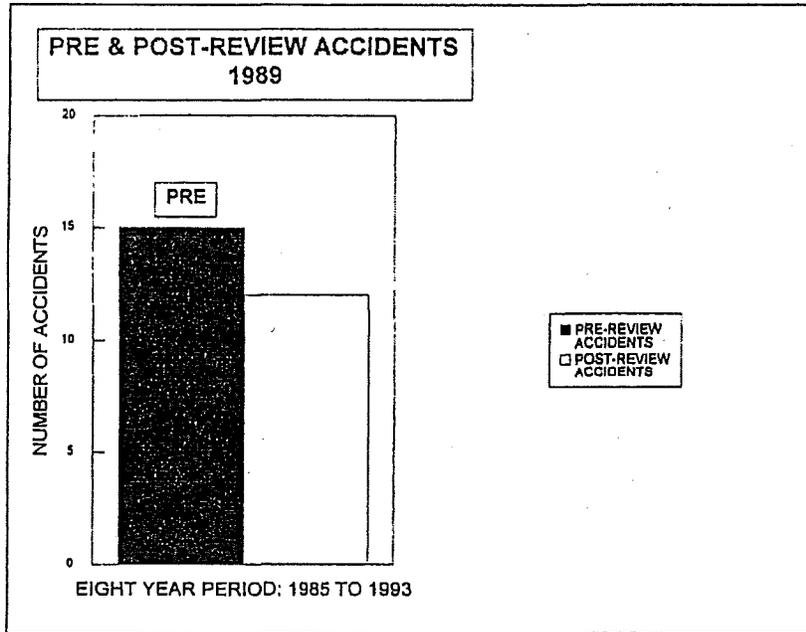
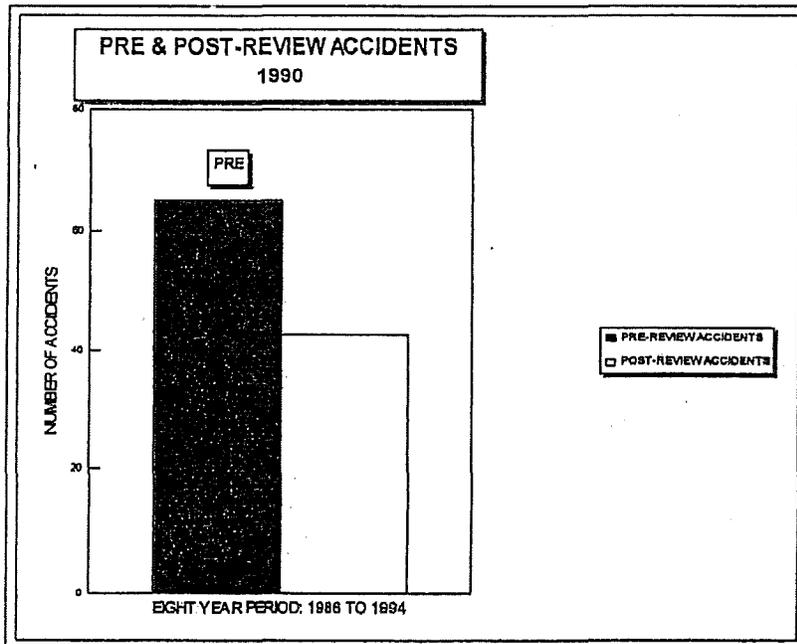


Chart 3



Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review

Chart 4

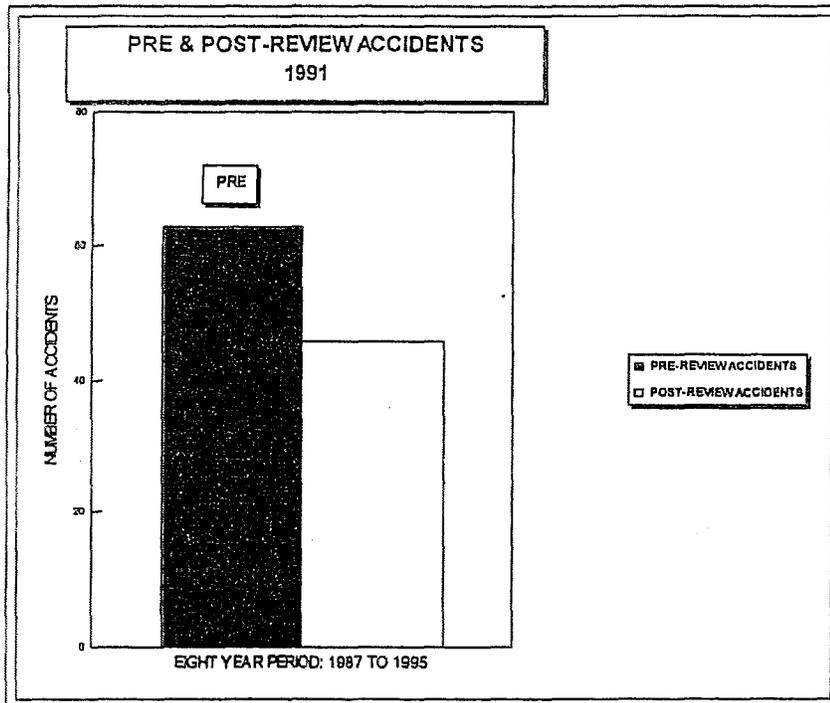
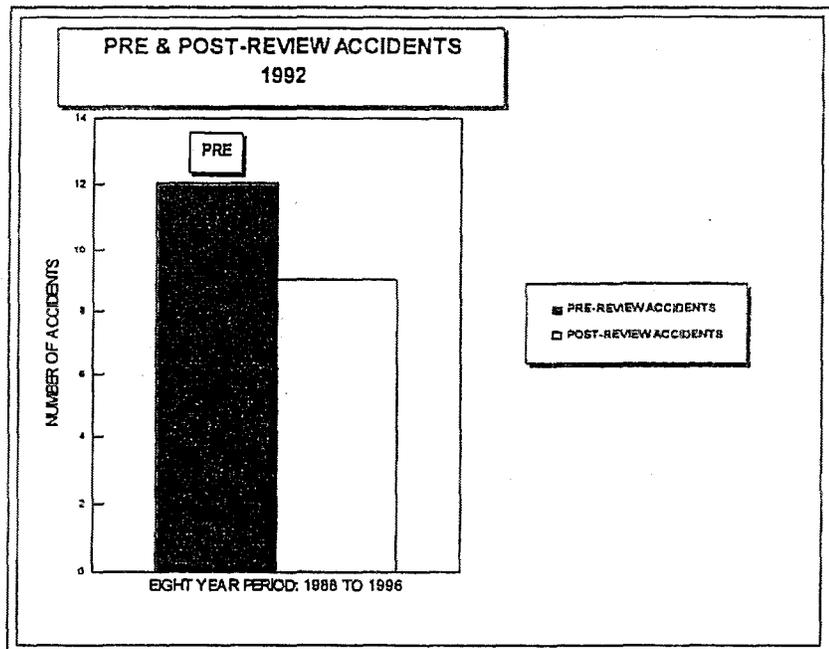
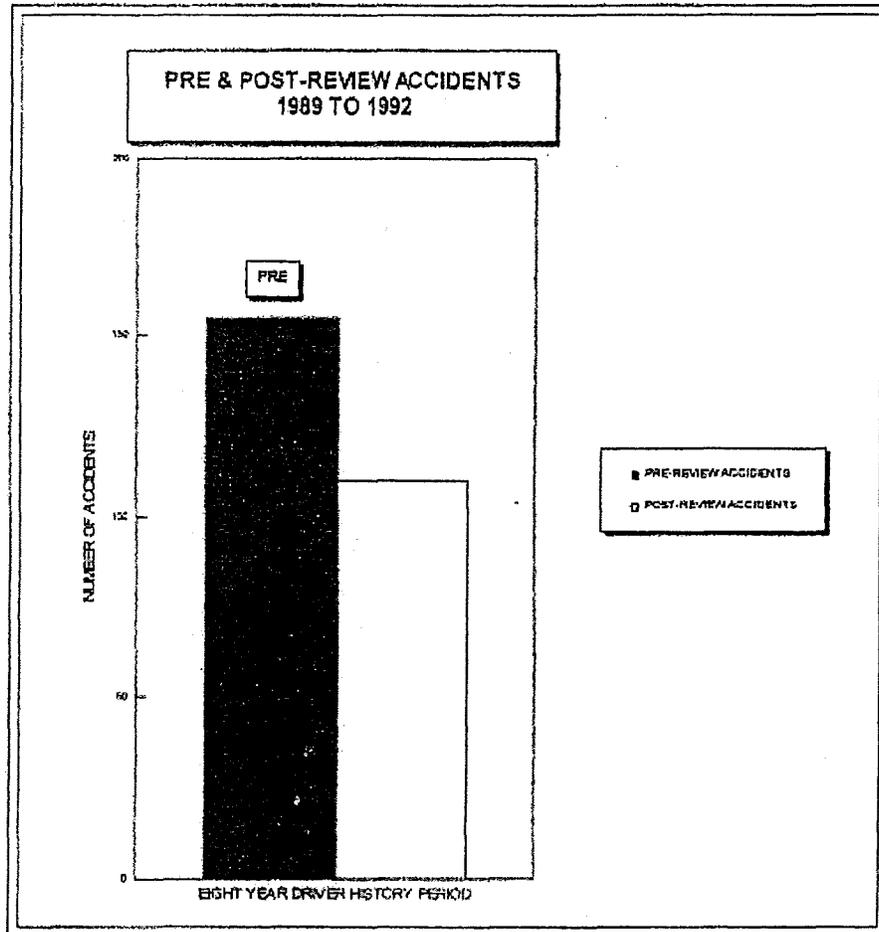


Chart 5



Drivers with 20/50, 20/60, and 20/70 Visual Acuity:
A Comparison of Accidents 4 Years Before and 4 Years After Medical-Review

Chart 6



▪ Post-review accidents significantly less ($p < .01$)



Appendix E:

Driver Fitness Medical Guidelines

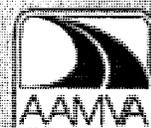
By the National Highway Traffic Safety Administration produced in
cooperation with the American Association of Motor Vehicle Administrators

Driver Fitness Medical Guidelines

September 2009



Produced in cooperation with the
American Association of Motor Vehicle Administrators



Reference Number	Complete Citation (With Quality of Evidence)
1	Rubin, G. S., et al., (2007). A Prospective, Population-Based Study of the Role of Visual Impairment in Motor Vehicle Crashes Among Older Drivers: The SEE Study. <i>Investigative Ophthalmology & Visual Science</i> ; 48:1483-1491. [moderate]
2	Owsley, C., et al., (1998). Visual Processing Impairment and Risk of Motor Vehicle Crash Among Old Adults. <i>JAMA</i> , 279:1083-1088. [moderate]
3	Hills, B. L., & Burg, A. (1977). A Reanalysis of California Driver Vision Data: General Findings. Report N. LR 768. Crowthorne, Berkshire, UK: Transport and Road Research Laboratories. [moderate]
4	Decina, L. E., & Staplin, L. (1993). Retrospective Evaluation of Alternative Vision Screening Criteria For Older and Younger Drivers. <i>Accident Analysis & Prevention</i> ; 25:267-275. [moderate]
5	Gresset, J., & Meyer, F. (1994). Risk of Automobile Accidents Among Elderly Drivers With Impairments or Chronic Diseases. <i>Canadian Journal of Public Health</i> , 85:282-285. [moderate]
6	Shipp, M. D. (1998). Potential Human and Economic Cost-Savings Attributable to Vision Testing Policies for Driver License Renewal, 1989-1991. <i>Optometry and Vision Science</i> , 75:103-118. [moderate]
7	Levy, D. T., et al., (1995). Relationship Between Driver's License Renewal Policies and Fatal Crashes Involving Drivers 70 Years or Older. <i>JAMA</i> , 274:1026-1030. [moderate]
8	Grabowski, D. C., et al., (2004). Elderly Licensure Laws and Motor Vehicle Fatalities. <i>JAMA</i> , 29:2840-2846. [moderate]
9	McGwin Jr., G., et al., (2008). The Impact of a Vision Screening Law on Older Driver Fatality Rates. <i>Archives of Ophthalmology</i> , 126:1544-1547. [moderate]
10	Higgins, K. E., et al., (1998). Vision and Driving: Selective Effect of Optical Blur on Different Driving Tasks. <i>Human Factors</i> , 2:224-232. [moderate]
11	Schieber, F. (2004). Highway Research to Enhance Safety and Mobility of Older Road Users. In: <i>Transportation in an Aging Society: A Decade of Experience</i> . Washington, DC: Transportation Research Board, pp. 125-154. [overview]

Other Considerations:

When a driver is identified who does not meet the visual acuity⁵ standard for licensure, it is appropriate for the DMV to suggest that the driver seek a comprehensive eye examination from an ophthalmologist or optometrist (in case they have not had one recently). In some cases, the reduced visual acuity might be improved with appropriate treatment (e.g., corrective lenses, cataract⁹³ surgery). Since visual acuity impairment often has a very gradual onset, particularly in older adults, the person may not be aware that vision has declined.

Some jurisdictions allow for the use of the bioptic telescope¹⁰⁴ by drivers with visual acuity impairment, and among these jurisdictions, there is wide variability in the eligibility criteria for bioptic driving. It is important to note that there is no clear evidence either supporting or opposing the safety of bioptic driving. A few studies have been carried out but they are methodologically flawed and do not resolve this issue.

Although visual acuity has never been shown to be a good screening test for identifying drivers at high-risk for future crash involvement, a visual screening test used at licensing offices does ensure that a driver meets some minimum level of vision. The critical importance of the acuity test fulfilling this function at licensing offices cannot be ignored or denied; the public wants and deserves a government agency that has some method for not

allowing the licensure of people with serious vision impairment. However, the issue then becomes what should the cut point be for pass versus fail on the visual acuity screening test. As discussed above, the research does not tell us what this cut point should be. Some jurisdictions allow drivers with visual acuity down to 20/100 to drive if they can demonstrate driving fitness in an on-road test by a driving specialist. It is recommended that these jurisdictions evaluate the safety (i.e., crash involvement) of these drivers over time and compare them to drivers who do pass the visual acuity screening test that the jurisdiction administers. This would be very helpful information for jurisdictions that are considering the wisdom of extending licensure of applicant with visual acuity as low as 20/100.

Recommendation:

One of the following will be checked.

- Evidence is relatively clear and allows for a recommendation.
- Evidence is not so clear cut but is suggestive and allows for a guidance statement.
- Evidence is either highly inconclusive or non-existent and does not suggest a specific driver licensing action.

Recommendation or Guidance Statement:

The use of a visual acuity⁵ screening test at licensure and re-licensure ensures that a driver meets a jurisdiction's vision standard at the moment of licensure or re-licensure. Driving is inarguably a highly visual task, and thus visual acuity screening is an important step jurisdictions take to prevent people with serious impairment in their central vision from becoming licensed. A positive impact of visual acuity screening is that it ensures that signs and other critical markings in the roadway environment (lane markings) will be adequately legible to most drivers.

Driver re-screening policies that include a visual acuity screening test have been shown to reduce the fatality rate of older drivers, but it is important to recognize that it remains to be determined what it is about re-screening policies that makes them effective in reducing fatality rates. An important advantage that visual acuity screening for licensure or re-licensure offers is that it provides feedback to drivers who fail the screening test that they may need a comprehensive eye examination that might lead to treatments to improve their vision.

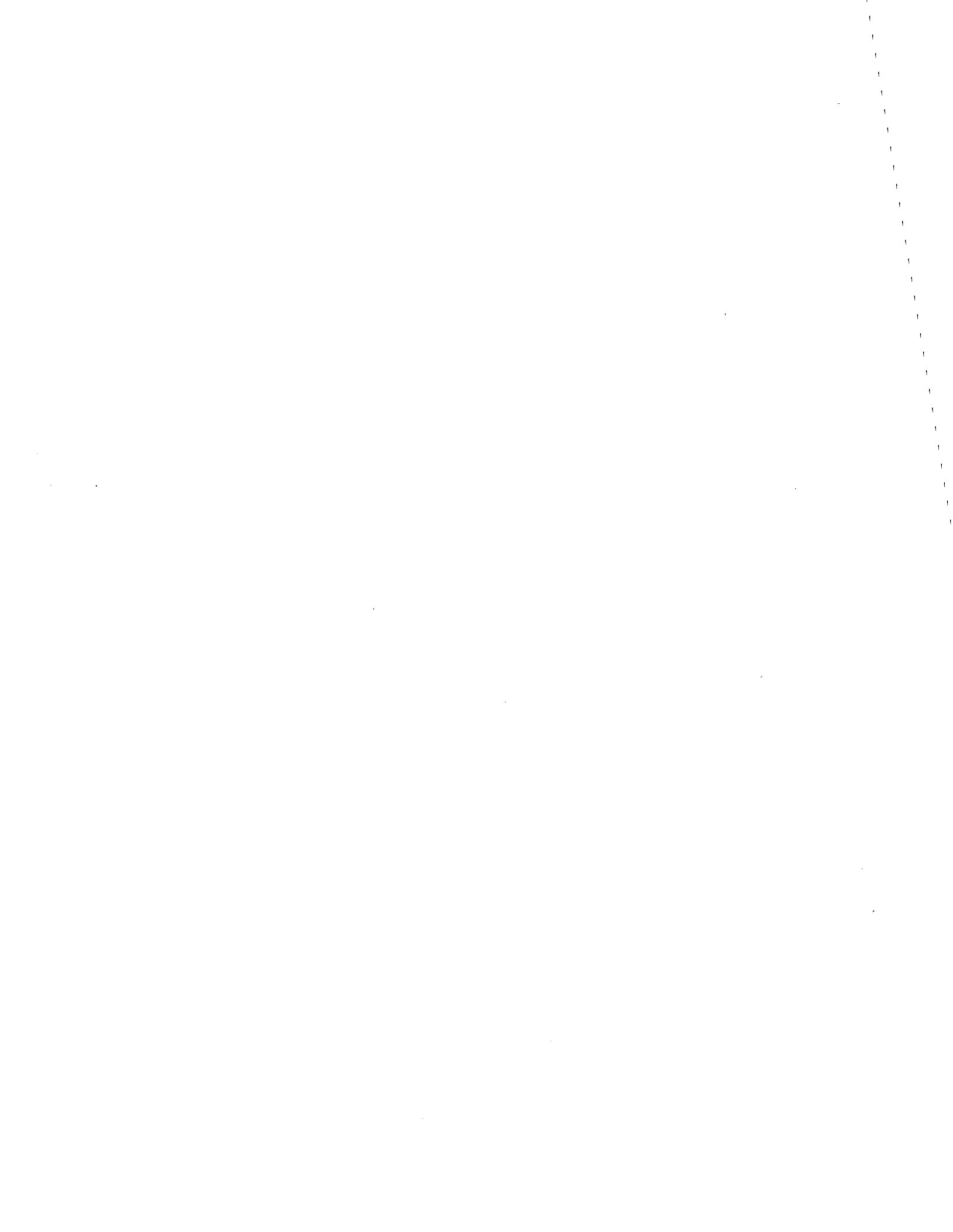
There are several benefits to visual acuity screening at licensure. However, it is important to recognize that visual acuity is unrelated to or only weakly related to future driver safety (i.e., crash involvement). Thus, visual acuity testing by itself is not an effective way to screen for drivers at high risk for crash involvement. Other visual factors (discussed in other sections) are much more important in understanding crash risk, particularly in older drivers, than is visual acuity.

It is difficult to suggest the appropriate pass-versus-fail cut-off that should be used for visual acuity screening. The research to date does not provide an answer to the "cut-point" problem. However, there is an important opportunity going forward that might go far in addressing this question. Specifically, some jurisdictions are allowing applicants with visual acuity down to 20/100 to drive if they can demonstrate safe driving skills in an on-road evaluation conducted by a driving specialist. Comparison of the motor vehicle collision rate of these drivers to that of drivers who pass the visual acuity screening test could be very informative as to the safety impact of such a policy.



Appendix F:
Data Overview and Comparison of State Laws

1. Bioptic Driver Data Review by Duane Brunell, Maine Department of Transportation
2. Summary of Owsley Study by Dr. Robert Dreher, Medical Advisory Board
3. Survey on Bioptics by the American Association of Motor Vehicle Administrators
4. 2013 Survey of Other States, Maine Bureau of Motor Vehicles
5. Comparison of States' Bioptic Driving Laws by Steve Kelley, The Iris Network



Bioptics Driver Data Review

Summary: Bioptics users represent a very small population and for that population, there is very limited data and tracking – so what is available cannot be statistically evaluated to any significant degree. What is available points to a significantly higher crash rate (based on crashes/driving population) including crashes resulting in fatalities. It would be interesting to further know if all those drivers recorded in states are regular drivers, and if so what their average driving mileage is to further understand any increased crash susceptibilities. It has been suggested to Maine BMV to try to obtain more extensive data to better make an informed decision – this additional data could include: fatal outcomes other severity outcomes analysis, longer periods of performance review (in some cases a year or less crash data was available) and more citation data. While crash rates were found to be higher in these studies, citation rates were found to be lower – with commentary on this being that these drivers would be expected to be more compliant and compensate for their visual abilities, especially related to issues of speed - but “if BTL drivers in the sample did driver less and more carefully, this compensation was not entirely adequate.”(Nancy Clarke)

Individual Studies

Biopic Lens Survey (state by State based on 2010 and 2011 data)

Only two states had reported crash information. Oregon for one year with 3 crashes out of 30 biopic drivers (10%), and West Virginia with 6 out of 61 drivers involved in crashes over an 8 month period (pro-rated to an annual 14.8% of bioptics drivers). This would be more than double the crashes/driving population in Maine of about 4.8%.

Nancy Clark report, March 1996

Found that an average Biopic driver fatal/injury crash rate was 1.7 times that than the comparison group and 1.9 times the crash rate. Taking out performance of comparison group drivers with invalid licenses, comparative rates rise to 2.2 & 2.3 times the comparative group rate. This was a 2 year study involving 609 drivers with a bioptics driving restriction vs. a comparison group of 28,109 drivers. Also noted that the sunset to sunrise restriction was not heeded

Study: Biopic Lens Drivers 1976-1982 (Maine BMV – 2/18/83)

Very small sample group –reported crash rate for bioptics drivers was 85% higher than average drivers, but I could not verify how that rate/number was derived. One driver was not included in the study who had 4 crashes in 7 years, one of which was a fatality – and for that driver “lack of visual ability to be the primary cause of the accident”. For the rest of the study group – there were 5 crashes over a 7 year period for 14 drivers. It was unclear whether all 14 drivers drove during the entire 7 year review period. One finding stated that for these 5 crashes, all “were caused by the biopic driver because he or she failed to observe other traffic.”

Virginia Study

Recent Study: total of 546 drivers in Virginia with the special BTL restriction on their licenses. Of that set of drivers, 75 of them were involved in 93 accidents in the past 5 years. None of those accidents involved fatalities.

Preliminary evaluation –Crash rate (crashes per a licensed-driver based population) is, at first look , slightly higher than average; but at a presumed even higher than average crashes per hundred million vehicle miles rate, based on anticipated lower average annual mileage driven by bioptics drivers.

This study has a better sized sampling than looked at in other available case studies.

Still need to consider comparative exposures with general driving public – were all of these bioptic drivers actively driving for the entire 5 year period? If so, how many average annual vehicle miles? Exposure quantification (miles driven and driver-years exposure) does seem somewhat soft and future studies need to have that exposure fully assessed before any even basic evaluation can be reliably done. Crash causal analysis also was not fully developed, which would be an important part of the safety performance assessment.



Whereas, the State of Maine studied a small group of bioptic lens drivers in the 1970's and 1980's and found the crash rate to be high and whereas other states have had similar increased crash rates with bioptic drivers, a review of current literature was undertaken by this group of physicians and the current literature fails to show statistical proof of safety driving with bioptics; however, research has shown that perhaps visual acuity standards could be relaxed if drivers with low vision are monitored carefully and if restrictions are placed on such drivers that do not meet the 20/40 visual acuity standard in their best eye.

Dr. Cynthia Owsley has done much research on driving safely and some of these articles are:

1. *Driving with Bioptic Telescopes: Organizing a Research Agenda*, Br J Ophthalmol. 2009 March; 93(3): 400-404
2. *Vision and Driving*, Cynthia Owsley, and Gerald McGwin, Jr.a,b"Vision Res. 2010 November 23; 50(23): 2348-2361.

Dr. Owsley notes in these articles that self reporting of crashes by drivers is unreliable and often under reported. This may explain why Charles Huss's phone interviews with his bioptic drivers looks so favorable compared to the crash rate reported by West Virginia's motor vehicle division. Unfortunately, it also means that surveying the bioptic drivers in New Hampshire might not give us meaningful information.

Dr. Owsley also notes (as other authors have said) that there is no proof of safety using bioptic lenses to drive. But she said that there is proof of safety for drivers with low vision without bioptics. She points out several research studies that came to that conclusion including this study of hers from 2009.

interstate driving, not to exceed 45 miles per hour and their crash records and citation records will be monitored for two years by the Bureau of Motor Vehicles or the State Police to determine if this group is or is not an acceptable risk to public safety. Those who wish to wear bioptics to drive (but not to pass the standard vision test) are required to obtain training as set forth by the BMV.

Robert J. Dreher, MD

11/3/13







Bioptics

Information requested on behalf of Montana.

Last updated: 5/24/10

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
<p>Alabama</p> <p>Katie Pouncey Katie.Pouncey@dps.alabama.gov</p> <p>Diane Woodruff Diane.woodruff@dps.alabama.gov</p>	<p>At least 20/200 in each eye using the carrier lens. With the bioptic the visual acuity must be at least 20/60.</p>	<p>Applicants must score greater or equal to 24 on a mini mental status exam (MMSE). This is administered by a Certified Driving Rehabilitation Specialist (CDRS). A certificate of adequate training in the proper use of the the bioptic must be presented to the CDRS, then driving specific training begins with the CDRS. The cost for required training is the responsibility of the bioptic applicant.</p>	<ul style="list-style-type: none"> • Daylight driving only • Outside Mirrors • Bioptic Lens Required 	<p>Currently Alabama has 62 license bioptic drivers.</p>
<p>Alberta Transportation</p> <p>Trudy Iwanyshyn trudy.iwanyshyn@gov.ab.ca</p>	<p>In accordance with the Canadian Council of Motor Transport Administrators (CCMTA) Medical Standards for Drivers, individuals are not permitted to hold any class of operator's licence.</p>	<p>Section 1.7 of the CCMTA Medical Standards provides provisions to review exceptional cases as follows: The loss of some visual functions can be compensated for adequately, particularly in the case of longstanding or congenital impairments. When an individual becomes visually impaired, the capacity to drive safely varies with his/her compensatory abilities. As a result, there may be individuals with visual deficits who do not meet the vision standards for driving but who are able to drive safely. On the other hand, there may be individuals with milder deficits who do meet the vision standards but who cannot drive safely. In these exceptional situations, it is recommended that the individual undergo a special assessment for the fitness to drive. The decision on fitness to drive can only be made by the appropriate licensing authorities. However, it is recommended the following information be taken into consideration: (1) favourable reports from the ophthalmologist or optometrist; (2) good driving record; (3) stability of the condition; (4) no other significant medical contraindications; (5) other references (e.g. professional, employment, etc); (6) assessment by a specialist at a recognized rehabilitation or occupational therapy centre for driver training.</p>	<p>n/a</p>	<p>None at this time.</p>

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
Alberta, <i>continued</i>		In some cases it may be reasonable to grant a restricted or conditional licence to an individual to ensure safe driving. It may also be appropriate to make such permits exclusive to a single class of vehicles.		
Arizona Donna Dailey ddailey@azdot.gov	20/40 in at least one eye.	No additional testing/training is required.	No restrictions. Daylight hours restriction applies only to a person with binocular vision and a visual acuity of 20/50 or 20/60.	N/A
California Patrick Barrett pbarrett@dmv.ca.gov	Drivers must have more than 20/200 visual acuity in the better eye without the aid of a bioptic lens.	Bioptic lens wearers are expected to receive training from the vision specialist on the use of the bioptic lens. No minimum training requirements have been specified.	Bioptic lens wearers are restricted to driving during daylight hours only. Other restrictions may be imposed due to physical/mental limitations.	This data is not readily available. A DMV research study conducted in 1996 indicated that 606 drivers were restricted to wearing a bioptic lens.
Connecticut Kathleen F. Beal Kathleen.Flanagan-beal@ct.gov	Connecticut does not allow the use of any type of telescopic lenses for driving purposes Our regulation is as follows: Sec. 14-45a-4. Use of telescopic aids An operator's license shall not be issued to an operator who uses spectacle mounted telescopic aids. (Effective June 22, 1992)			
District of Columbia Rafael Bonilla rafael.bonilla@dc.gov	The same requirement for use of regular corrective lenses. At least 20/40 in one eye and no less than 20/70 in the other, exceptions exist	There is no special training for customers with bioptics.	May be restricted to daylight driving if with bioptics applicant has less than 20/40, but not less than 20/70, in the best eye, and a field of vision of at least 140 degrees in the horizontal meridian.	DMV does not keep track of how many, if any, use bioptics.

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
<p>Georgia</p> <p>Ray Higgins rhiggins@dds.ga.gov</p>	<p>20/60-20/200</p> <p>Customer must attain a visual acuity of at least 20/60 utilizing bioptic telescopes.</p>	<p>Customer must present documentation of having satisfactorily completed training in the use of bioptic telescopes as certified by the prescribing doctor.</p> <p>Customer must also complete a standard driver's education course while using the bioptic telescopes prior to the on-the-road evaluation.</p> <p>The customer pays all applicable charges.</p>	<p>Daylight driving only</p> <p>Outside rear-view mirrors</p> <p>Certain area</p> <p>Time restrictions</p> <p>No interstate driving</p> <p>Biennially reevaluations by an optometrist or ophthalmologist</p> <p>Other such restrictions deemed appropriate.</p>	<p>383</p>
<p>Idaho</p> <p>Vicky Fisher vicky.fisher@itd.idaho.gov</p>	<p>20/40 or better in one eye</p>	<p>Drivers must pass a driving skills test with a DMV skills tester. Applicant must pay the \$24.00 fee for the skills test</p>	<ul style="list-style-type: none"> • Annual visual exam • Annual road test • Daylight driving only • Skills tester may add special restrictions. 	<p>Unknown</p>
<p>Illinois</p> <p>Jo Ann Wilson jwilson@ilsos.net</p> <p>Mary Imboden mimboden@ilsos.net</p>	<p>Central acuity through the telescopic lens must be 20/40 or better. The magnification of the telescopic lens may not exceed 3X (X=power) for a standard lens or 4X for a wide-angle design.</p>	<p>Requesting a license for the first time using the aid of a telescopic lens requires the applicant to pass the "Traffic Environmental Screening." This consists of the applicant demonstrating the ability to recognize actual traffic conditions while using the telescopic lens arrangement while riding with and being evaluated by a Driver Services facility representative.</p>	<p>Class D license only (16,000 lbs or less)</p> <p>Daylight driving only</p>	<p>304</p>
<p>Indiana</p> <p>Michele Lyda mlyda@bmv.in.gov</p>	<p>20/100- 20/200</p>	<p>A driver must be evaluated by a low vision specialist and an certified rehabilitation specialist for the initial process. The driver must have a minimum of 30 hours of specialized training with a rehabilitation center. Upon satisfactorily completing the training, the driver must successfully pass a drive test with a Bureau of Motor Vehicles Senior Driver Examiner.</p>	<ul style="list-style-type: none"> • daylight driving only • annual vision screening • bioptic lens • driving radius 	<p>300</p>
<p>Kansas</p> <p>Martha Bean Martha_bean@kdor.state.ks.us</p>	<p>We don't have a limit on visual acuity in the carrier lenses. It is of the utmost importance that jurisdictions understand that the bioptic reading is not the</p>	<p>Training is not mandatory in Kansas, but obviously is needed. The applicant would have to pay for his own training. In some cases medicare picks up part of it.</p>	<p>All of our general restrictions may be applied by doctor or by examiner</p> <p>Corrective Lenses, Daylight Only, No Interstate/Freeway,</p>	<p>134</p>

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
Kansas, <i>continued</i>	true (best correction) reading, this is a device by which to magnify signs and hazards. It magnifies speed and light. You can not look thru it all the time. The applicant must drive test based on his reading in the carrier (regular lenses).		Licensed Driver Ft Seat, Outside Mirrors, City Limits, Mileage from home restrictions etc. No restriction is mandatory except corr lens.	
Louisiana Debbie Hoover dhoover@dps.la.gov	20/200- Eyesight must improve to at least 20/60 with bioptics and without the use of field expanders	30 hours of behind the wheel training is required from a state approved bioptic trainer. Must pass a special road test given in Baton Rouge on a special route. Training is paid for by the licensee.	<ul style="list-style-type: none"> • Daytime only driving • Submit yearly or bi-yearly a Bioptic Telescopic Vision Statement 	30
Maine Linda Grant linda_grant@maine.gov	n/a	n/a	n/a	n/a
Manitoba Victoria Macdonald vmacdonald@mpi.mb.ca	Individually assessed	If a beginner driver must complete lessons, OT driving assessment (at local hospital) and specialized vision road test. Driver pays for lessons only, OT assessment covered by hospital program. No charge for specialized vision road test conducted by licencing authority. If had licence and vision deteriorated requiring BTS, driver would still be required to complete OT assessment and specialized vision road test.	Individually assessed depending where wants to drive. Daytime driving only always applied.	Not known. Less than 15.
Michigan Carol Reagan ReaganC@Michigan.gov	Driver applicants that use a bioptic telescopic lens (BTL) are required to meet <u>Visual Standards For Motor Vehicle Drivers' Licenses</u> . The BTL may be used to meet visual acuity standards.	Driver applicants that use a BTL are required to submit a <u>Vision Specialist's Statement of Examination (DI-4V)</u> to DMV; to pass a DMV knowledge test; to successfully complete training and evaluation with a Certified Driving Rehabilitation Specialist (CDRS); to submit a CDRS report to DMV; and to pass a DMV road test. Vision examinations and CDRS training and evaluation are completed through third parties (not certified or evaluated by DMV) and are at the driver's expense.	<ul style="list-style-type: none"> • Corrective lens • BTL • Daylight only (min. 1 year) • No freeway (min. 1 year) • Additional conditions and requirements may also be imposed 	935
Minnesota Lisa Koenig Lisa.koenig@state.mn.us	N/A- MN does not have a bioptics rule, if they meet 20/100 with bioptics they may be considered for a restricted license	N/A- Minnesota does not have a bioptics program but some drivers have been permitted to obtain very restricted licenses with bioptics. These drivers must pass the skills test with bioptics to be considered and must pass it at each renewal cycle.	N/A- There is no standard set of restrictions but a radius restriction based upon the driving performance is almost always imposed, Corrective Lenses, others possibly	Less than 50

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
Missouri Brad Brester Brad.brester@dor.mo.gov	20/160 or better acuity reading	Drivers must be able to meet the minimum acuity standards without the use of the bioptic lens(es). They may complete the driving skills examination using the bioptic lens(es).	Restrictions will be based on best possible visual acuity reading.	Statistics not available.
Montana Kristine Thatcher kthatcher@mt.gov	We do not allow bioptics.			
Nebraska Sara O'Rourke Sara.orourke@nebraska.gov	20/70 or less	Individuals wearing bioptics are required to provide a vision statement and take a drive test at least once every two years.	Z – bioptic lens required and any other vision restrictions we have that might be necessary.	50
New Brunswick Charles O'Donnell Charles.O'Donnell@gnb.ca	New Brunswick does not allow bioptic lenses to drive.			
New Jersey Mick Byers mick.byers@dot.state.nj.us	There is no qualifying acuity.	A Medical review is required which involves testing by a low level vision specialist and further review by the New Jersey Motor Vehicle Commissions' (MVC) Medical Advisory Panel. The driver may elect to submit to training sessions with a private provider, at their own cost, culminating in a road test to be taken at a New Jersey MVC Driver Testing facility.	<ul style="list-style-type: none"> Daylight only 	82
New York Tiffani Beza-Gaffney TBeza@dmv.state.ny.us	20/40 (Snellen) with telescopic lenses, and 20/100 through the carrier lenses in either or both eyes, and with a horizontal field of vision of no less than 140 degrees without the use of field expanders.	Yes. Training is provided by the applicant's eye care provider. The minimum training requirements are as follows: 1)The person has been trained so that he or she can locate stationary objects within the telescopic field by aligning the object directly below the telescopic lens and then moving his or her head down and his or her eyes up simultaneously. 2) The person has been trained so that he or she has mastered the ability of locating a moving object in a large field of vision by anticipating future movement, so that by moving his or her head and eyes in a coordinated fashion, he or she can locate the moving object within the telescopic field. 3) The person has been trained to remember what he	Telescopic Lens	1200

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
New York, <i>continued</i>		<p>or she has seen after a brief exposure, with the duration of exposure diminished constantly to simulate short looking time while driving.</p> <p>4) The person has experienced levels of illumination such as daylight, dusk, and nighttime.</p> <p>5) The person has experienced walking, and riding as a passenger in a motor vehicle so hat he or she has actually experienced moving while objects are changing position.</p>		
North Carolina Susan M. Stewart ssewart@ncdot.gov	Any acuity up to 20/200	<p>Our training is being developed, we are working with the patients, ophthalmologists and other organizations to develop a training program. Currently we are conducting a complete review of the driver to assure there are not other contributing health factors that would pose additional risk, if customer has been driving a review of the driving record will be evaluated. If customer is a minor we will work with the parents to agree on training with the parents. Each case is evaluated individually with all contributing factors considered.</p>	<ul style="list-style-type: none"> • Lower rate of speed • Daylight only • Mile radius of home • No interstate • time of day • Weather related • With licensed driver (at first) 	
North Dakota Syndi Worrel sworrel@nd.gov	Must score at least 20/40 in the bioptic lense and at least 20/130 each eye in the carrier lense. Must have full field of vision.	<p>No mandatory training; however, a letter from an eye specialist stating acuity and field of vision is required. The specialist will also reference length of time the applicant has been fitted with bioptics and ease of use or adaptability.</p>	<p>Daylight driving only. Area restriction. Speed restriction.</p>	17
Northwest Territories Kelley Merilees-Keppel Kelley_Merilees-Keppel@gov.nt.ca	N/A	N/A	<p>As per CCMTA, all telescopic systems currently available cause visual field reduction. Individuals requiring the use of telescopic lenses should not be permitted to obtain or hold any class of driver licence.</p>	NONE KNOWN
Nova Scotia Lori Payne paynelk@gov.ns.ca	We are not aware of any drivers with bioptics in our jurisdiction. If we do receive an application from a driver with bioptics, we will refer to our Medical Advisory Committee for advice.			

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
Oklahoma Sherri Becker sbecker@dps.state.ok.us	Same as the past. We do not allow bioptic lenses.			
Ontario Tamara Bishop Tamara.Bishop@ontario.ca	Ontario does not allow bioptics.			
Oregon Mary Grosso Mary.I.grosso@state.or.us	Visual acuity that is between 20/80 and 20/200	<p>Completion of a training program is required prior to issuance of a regular Class C instruction permit or license. (Attached is a fact sheet on who is eligible and what is required to apply to the Limited Vision Condition Program.)</p> <p>Once the application is approved, a Special Limited Vision Condition Instruction Permit is issued directly to a Rehabilitation Training Specialist for driver training with bioptic lenses. These are private individuals that are approved by DMV.</p> <p>The training requirements, and all rules governing limited vision drivers, are in administrative rule OAR 735-062-0300 through OAR 735-062-0390. (Links attached.)</p>	<ul style="list-style-type: none"> • Must use bioptic telescopic lense while driving. • Daylight only. <p>Night time driving is permitted if approved by a vision specialist and nighttime training is completed. (See Fact Sheet.)</p> <p>Every two years a person licensed under these laws must: 1) submit a report from a vision specialist certifying the person is qualified; and 2) must take a drive test administered by DMV.</p>	30
Pennsylvania Scott Shenk rshenk@state.pa.us	Bioptic lens cannot be used to meet the vision requirements	N/A	N/A	N/A
Quebec Jamie Dow Jamie.dow@saaq.gouv.qc.ca	Anyone who does not meet the visual acuity standard (6/15) may attempt to demonstrate to the SAAQ that they can drive safely despite their handicap. If they wish to use Bioptic lenses for the visual acuity-impaired road test (a specific in-house test that we have designed for drivers with	No	Limited geographical area. No driving on our equivalent of interstate highways.	2. Most fail the test.

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
Quebec, <i>continued</i>	impaired visual acuity) that is there decision.			
Saskatchewan Leann Nixon lnixon@sgi.sk.ca	We do not allow bioptic lenses			
South Carolina James Barwick James.Barwick@scdmv.net	<p>If the worst eye is not blind: 20/200 or lower----- the good eye must be 20/70 or better to pass.</p> <p>TELESCOPIC LENS</p> <p>Do not check an applicants eyes through the use of the telescopic lens. Applicant must pass eye test without the use of their glasses or the use of their conventional glasses.</p> <p>Telescopic lenses alone are not sufficient reason to refuse an applicant from obtaining a driver's license or beginner's permit. If the applicant's conventional lenses meet the minimum state requirement, the applicant is eligible for a south carolina driver's license or beginner's permit.</p>	No	<p>If recommended by the Medical Advisory Board (MAB) *</p> <ul style="list-style-type: none"> • Daylight Driving Only * • NOT TO EXCEED 50 MPH * • Corrective Lens • No Interstate Driving * • Neighborhood Only * • Outside Mirrors 	Not Tracked or Recorded
South Dakota Jane Schrank Jane.schrank@state.sd.us	20/60 or better	Drivers must have a state vision form completed by their ophthalmologist and pass a drive test at the exam station.	Corrective lenses, no night driving, no driving outside of town, left outside rearview mirror, and/or 50-mile radius of residence.	Unknown
Tennessee Edwin Mimms Edwin.mimms@tn.gov	20/60-20/100	3. Prior to application, the bioptic wearer shall complete training in driving with a bioptic telescopic lens(es) from a driving instructor certified in this field. The applicant is responsible for the training.	Bioptic lense applicants are only eligible to have a class D, (Auto) PD (Learner Permit) or H (Hardship) license.	290

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
Tennessee, <i>continued</i>		<p>Basic training requirements include:</p> <p>(I) Locating stationary objects within the telescopic field of view, by aligning the object directly next to the telescopic lens(es), and then moving his/her head and his/her eyes simultaneously to see the object with the telescope.</p> <p>(II) Locating a moving object in a large field of vision by anticipating future movement, so that by moving his/her head and eyes in a coordinated fashion he/she can locate the moving object within the telescopic field.</p> <p>(III) Training in brief visual exposure with the deviation of exposure diminished constantly to simulate short-looking time while driving.</p> <p>(IV) Experiencing riding as a passenger in a motor vehicle and also walking, so that he/she has actually experienced moving while objects are changing position.</p> <p>(ii) Training in the use of bioptic-telescopic lens(es) does not entitle the wearer to a driver license. It only assists him/her to qualify on the vision portion of the testing.</p> <p>At the time of the application, the applicant is also required to present certification of having completed training in the use of a bioptic telescope for driving purposes.</p> <p>(i) This certification shall be obtained from an optometrist or ophthalmologist identified by a recognized professional organization as one especially qualified in the field of Low Vision care or, (ii) from a Certified Rehabilitation Person.</p> <p>The applicant shall also present certification of having completed a certified driver education course. This course must have been completed while the applicant was wearing the bioptic telescopic lens(es)</p>	<p>Listed below are restrictions that may or may not be required. Restrictions shall not be limited to the following, but shall include any other restriction deemed necessary by the doctor of the licensee or the advisory board for low vision acuity.</p> <p>(i) Daylight driving only (ii) Fifty (50) m.p.h. maximum speed (iii) Outside rear-view mirrors (left/right) (iv) Certain area and time restrictions (I) Occasionally because of a visual defect and its observed affect on the driving performance, restriction may be necessary to a certain area or time. (v) No interstate driving</p>	

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
<i>Tennessee, continued</i>		<p>The applicant shall present a report from the Low Vision specialist on a form supplied by the Department which contains the following information:</p> <ul style="list-style-type: none"> (i) Patient's vital data; (ii) Date the system was dispensed; (iii) Complete information regarding the visual requirements outlined above; (iv) Diagnosis of the visual condition and an apparent date of onset; and (v) A statement concerning the stability of the condition (progressive, stable, or undetermined). <p>This report shall not be written until the applicant has used the system at least sixty (60) days, and shall have been conducted within six (6) months of the date of the application.</p> <p>From the initial report date, the applicant shall re-submit annually an updated report.</p> <ul style="list-style-type: none"> (i) if there has been a change in stability, a re-examination may be required. 		
<p>Texas</p> <p>Sheri Gipson Sheri.gipson@txdps.state.tx.us</p>	20/100 - 20/200	Applicants requiring the use of telescopic lenses (bioptics) must successfully complete a comprehensive road test and will be referred to the Medical Advisory Board. This is done the FIRST TIME ONLY.	<ul style="list-style-type: none"> • Daytime only • Not to exceed 45 MPH • No expressway driving 	Unable to provide number at this time.
<p>Vermont</p> <p>Shannon Fassett Shannon.fassett@state.vt.us</p>	We require vision corrected to 20/40. If they cannot pass our vision exam, we send them to an optometrist or ophthalmologist, and we honor their assessment.	No	Daylight only driving Vehicles under 10000 pounds GVWR.	There are 18 that are licensed in Vermont with that restriction.
<p>Virginia</p> <p>Jackie Branche Jacquelin.Branche@dmv.virginia.gov</p>	Visual Acuity: must be 20/200 or better in one or both eyes through the carrier lens (eyeglasses), AND must be 20/70 or better in one or both eyes through the bioptic telescopic lens, which must be mounted to the carrier lens.	No additional training is required; however, all BTL applicants must successfully pass a screening test and then a behind-the-wheel test with a DMV Driver Licensing Specialist. Drivers, who want training, do so at their own at their own expense. Training may be provided at various driver rehabilitation facilities throughout Virginia.	<ul style="list-style-type: none"> • Corrective lenses • Daylight driving only • Carrier lenses with BTL 	415

Jurisdiction / Respondent / Contact Info	What is the qualifying acuity for use of bioptics in your jurisdiction?	Is additional testing/training given to applicants with bioptics? If so, please explain. If so, who provides/pays for the training, i.e. the state or is it contracted out to a third party?	What restriction(s) may added to the driver license for bioptics?	Approximately how many licensed drivers do you have using bioptics?"
<i>Virginia, continued</i>	Horizontal Vision (without field expanders): must be 70 degrees or better. If one eye only, standard is 40 degrees or better temporal and 30 degrees nasal	Once the driver has successfully tested with DMV and driven for one year with the BTL, the driver may apply to test at night if they meet the required criteria with the BTL. These drivers must have a visual acuity of 20/40 or better in one or both eyes with the BTL and a horizontal vision of 100 degrees or better in one or both eyes with the BTL.		
West Virginia DMV R. Douglas Thompson, r.doug.thompson@wv.gov	20/70 – 20/200	Yes, drivers must complete the Bioptic driver training with the WV Division of Rehabilitation Services. The driver is responsible for the cost.	<ul style="list-style-type: none"> • Daylight driving only • Reduced speed • Personal Passenger Vehicle • Other restrictions added if needed 	30
Wyoming Nancy Coyle nancy.coyle@dot.state.wy.us	2/100 best possible with both eyes	Behind-the-wheel driving skills test (re-examination) given by a Driver License Examiner, and a current Vision Evaluation by their ophthalmologist.	<ul style="list-style-type: none"> • Reduced speed • Daylight driving only • No Interstate • Restricted areas • Yearly Eye Evaluations 	No real way to tell, but I would estimate no more than 10 individuals.
Yukon, Canada Walter Brennan Walter.brennan@gov.yk.ca	In Yukon we have not had a request nor do we have any regulation or policy regarding Bioptics use.			

This table was created by information provided by the responding jurisdictions.

Additional Information

The following jurisdictions do not allow bioptic lenses to drive.

CT, DC, FL, IA, ME, MN*, MT OK, ON, SK, UT

*Minnesota does not currently have any rules or laws about bioptics and handles each request on a case-by case basis, a road test is always required to use bioptics, the bioptics must allow the driver to meet a minimum vision acuity of 20/100, the driver will be retested at every renewal cycle or whenever their address changes.

The jurisdictions listed below allow bioptics to drive, but do not allow them to meet the vision requirements.

CA, HI, KS, MD, MO, NC, OR, PA, SC, WI, WY

The following jurisdictions allow the use of bioptics to drive and allow them to meet vision requirements using bioptics.

AK, AL, AR, AZ, CO, DC, DE, GA, ID, IL, IN, KY, LA, MA, MB, MI, MS, ND, NE, NH, NJ, NM, NV, NY, OH, SD, TN, TX, VA, WA, WV, WY

Mail Survey of
Other States - Updated 10/28/2013

	A	B	C	D	E	F	G	H	I	J	K	L
1	State	Allow Biopics	Bioptic Lenses Allowed for Testing	Number Drivers Using Biopics	Min Vision Standard	Bioptic Driver Restrict	Bioptic Driving Training Requirements	Crash Rate for Biopics Drivers	Crash Rate for All Drivers	Crash Rate w/o Biopics Vision < 20/60	Contact	Other Info/Links
2	Alabama	Yes	Yes	104	20/60 normal and for bioptic lens, 20/200 for carrier lens. 110° horiz & 80° vert field of vision	Yes	Yes	NA	NA	NA	Katie A Pouncey <Katie.Pouncey@dps.alabama.gov > 334-353-9067	Attachment to 09/13/2013 e-mail contains Alabama licensing Requirements for bioptic lens users.
3	Delaware	Yes	Yes	25	20/50	Yes	Yes	14 w/ no crashes 2012 - 1 w/ crash 2011 - 2 w/ crashes 2004 & earlier - 8 crashes	2.32 crashes/100 million vehicle miles driven in state for 2012	NA	Tanya Lyons 302-744-2552 <Tanya.lyons@state.de.us>	< http://dsp.delaware.gov/2012%20Annual%20Traffic%20Statistical%20Report.pdf >
4	Florida	NO	NA	NA	NA	NA	NA	NA	NA	NA	Becky Weekly <BeckyWeekly@flhsmv.gov >	NA
5	Missouri	Yes	No	NA	20/160, 55° both or 85° one eye	NA	No	NA	200 per 100 million miles driven for 2012 Fatalities - 1.21 per 100 million miles driven in 2012	NA	Gena Ahlers <GENA.AHLERS@dor.mo.gov >	NA
6	Nebraska	Yes	Yes	145	20/70	Yes	No	NA	157.1 per 100 million miles driven	NA	Sara O'Rourke 402.471.3861 <Sara.Orourke@nebraska.gov > www.Clickdmv.ne.gov	Bioptic drivers had 28 citations for different offenses in past 2 years

Maine Survey of
Other States - Updated 10/28/2013

	A	B	C	D	E	F	G	H	I	J	K	L
1	State	Allow Biopics	Bioptic Lenses Allowed for Testing	Number Drivers Using Biopics	Min Vision Standard	Bioptic Driver Restrict	Bioptic Driving Training Requirements	Crash Rate for Biopics Drivers	Crash Rate for All Drivers	Crash Rate w/o Biopics Vision < 20/60	Contact	Other Info/Links
7	North Carolina	Yes	Yes	NA - brand new law	20/40 normal, 20/200 carrier lens & 20/70 thru bioptic lens, 70"	Yes	Yes - Behind the wheel trng required for all novice (never been licensed) low vision candidates	Not applicable at this time	NA	NA	(Contact from Chuck Huss, WV) Matt Bailey, consumer advocate <radiomatt1@yahoo.com >	Passed a 20/200 bioptic driving bill (HB 673/SB568, July 3rd, 2013. <http://www.biopicdrivingusa.com>
8	North Dakota	Yes	Yes	13	20/130 each eye thru carrier lens, 20/40 in bioptic lens, "full field of vision"	Yes	No	NA	1.61 per 100 million miles driven for 2011	NA	Cassandra Aufenthie 701-328-4355 <cjaufenthie@nd.gov>	E-mail dated 07/10/2013, contains attachment w/ ND vision requirements
9	Oklahoma	Yes	NA	NA	NA	NA	NA	NA	NA	NA	Jeff Hankins 405-425-7732 <jhankins@dps.state.ok.us>	They have a law allowing biopics, but it has not been implemented yet.

Main Survey of
Other States - Updated 10/28/2013

	A	B	C	D	E	F	G	H	I	J	K	L
1	State	Allow Biopics	Biopic Lenses Allowed for Testing	Number Drivers Using Biopics	Min Vision Standard	Biopic Driver Restrict	Biopic Driving Training Requirements	Crash Rate for Biopics Drivers	Crash Rate for All Drivers	Crash Rate w/o Biopics Vision < 20/60	Contact	Other Info/Links
10	Oregon	Yes	No for visual acuity, unclear for skills testing	41	Normal-20/70 & 110° Biopic-20/80-20/200, 120°horiz & 80°vert	Yes	Yes	Not available	NA	NA	Mary L. Grosso 503-945-5520 <Mary.L.GROSSO@odot.state.or.us> < http://www.oregon.gov/ODOT/DMV/pages/driverid/limitedvision.aspx > Links to rules in e-mail	Starting 1/1/14, limited vision drivers will no longer be required to take DMV drive test every two years. Other links and information available. < Http://www.oregon.gov/ODOT/DMV/pages/driverid/limitedvision.aspx >
11	Pennsylvania	Yes	No	Not tracked	20/20-20/40 normal, 20/40-20/100 have restrictions, Field of vision = 120°	Yes	NA	Not available for biopics or visual acuity	124,092 crashes, 8.8 mil drivers, and 100.2 bil miles of vehicle travel	NA	Richard Kirkpatrick <RIKIRKPATR@pa.gov >	See e-mail from Dr. Dreher. Refer to: < http://www.biopicdriving.org/CPHuss1.htm >
12	Quebec	Yes	No	15	20/50 (20/30 for commercial)	Yes	No	9 of 15 drivers using biopics have had accidents.	Total crash rate not avail. Crash rate w/ injury = 6.008 per 1000 drivers	5 persons - w/ visual acuity worse than 20/60 - of these, 2 of these have had accidents	Nathalie Drouin <Nathalie.Drouin@saaq.gouv.qc.ca>	In addition to biopics drivers, there are 10 drivers who don't meet vision standards but passed a road test without telescopic lenses, and 4 persons do not meet vision standards but have learner permits.
13	South Dakota	Yes	Yes	NA	20/60 unless they wear biopics	Case by case	Encouraged but not required	NA	NA	NA	Jane Schrank 605-773-6390 <Jane.Schrank@state.sd.us >	Do not track separately from corrective lenses.

Maine Survey of
Other States - Updated 10/28/2013

	A	B	C	D	E	F	G	H	I	J	K	L
1	State	Allow Biopics	Biopic Lenses Allowed for Testing	Number Drivers Using Biopics	Min Vision Standard	Biopic Driver Restrict	Biopic Driving Training Requirements	Crash Rate for Biopics Drivers	Crash Rate for All Drivers	Crash Rate w/o Biopics Vision < 20/60	Contact	Other Info/Links
14	Texas	Yes	Yes	NA	2 eyed - 20/40-20/50, 1 eyed - 20/25-20/50 (see details)	Yes	No	NA	NA	NA	Rosendo Martinez 512-424-2767 <Rosendo.Martinez@dps.texas.gov>	DOT statistics available but do not give answers to these questions, as asked.
15	Vermont	Yes	Yes	NA	20/40	Yes	No	NA	NA	NA	Robin Jackson <Robin.Jackson@state.vt.us>	NA
16	Virginia	Yes	Yes	546	20/40 & 100* normally, 20/200 carrier + 20/70 biopic, w/ 70* (*)	Yes	No	75 drivers were involved in 93 accidents in past 5 years. No fatalities.	NA	NA	Jacquelin Branche, MBA, RN 804-367-4382 <jacquelin.branche@dmv.virginia.gov>	*More info on vision standards available at website - < http://www.dmv.virginia.gov/drivers/#medical/biopic.asp >
17	Washington	Yes	Yes	65	20/100	Yes	No	NA	NA	NA	Kimberly Mathis 360-902-0118 or <kmathis@dol.wa.gov>	Washington vision policies are available.
18	West Virginia	Yes	Yes - req'd	65	20/40, no req'd periph for normal, 20/50-20/200, visual field 110-120° horiz & 80° vertical	Yes	Yes	6 of the biopic drivers have had an accident 01/2013 - 08/26/2013	NA	NA	Chuck Huss <chuck.P.huss@wv.gov> 304-759-2264 Also - <Roxana.L.Dove@wv.gov>	NA

Maine Survey of
Other States - Updated 10/28/2013

	A	B	C	D	E	F	G	H	I	J	K	L
1	State	Allow Biopics	Bioptic Lenses Allowed for Testing	Number Drivers Using Biopics	Min Vision Standard	Bioptic Driver Restrict	Bioptic Driving Training Requirements	Crash Rate for Biopics Drivers	Crash Rate for All Drivers	Crash Rate w/o Biopics Vision < 20/60	Contact	Other Info/Links
19	Wisconsin	Yes	No for visual acuity, Yes for skills test	NA	NA	No	NA	NA	NA	NA	James Miller 608-266-0428 <James.Miller@dot.wi.gov>	NA
20	Wyoming	Yes	NA	NA	NA	NA	NA	NA	NA	NA	Donald Edington 307-777-4802 <don.edington@wyo.gov>	NA

Comparison of State Bioptic Driving Laws
 Prepared by Steve Kelley 01/07/2014

Sources: International Academy of Low Vision Specialists <http://www.ialvs.com>
 Dr. Windsor, Ford and Windsor: <http://www.biopicdrivingusa.com/>

State	Max acuity 20/	Driving w bioptics	Testing w bioptics	Mandatory Training	Notes
Alabama	200		1	1	1
Alaska	100		1	0	0 IALVS reports bioptics are permitted for vision screening
Arizona	60		1	1	0
Arkansas	60	n/a	n/a		0 IALVS reports that bioptics are permitted under certain conditions
California	200		1	0	0 corrected vision to 20/200 w/o bioptic
Colorado	70		1	1	0
Connecticut	200		0	0	0 States special cases issued at 20/200
Delaware	50		1	1	0 bioptic use on case by case as long as driving test is passed
Florida	70		1	0	0
Georgia	200		1	1	0
Hawaii	40		1	0	0
Idaho	40		1	1	0
Illinois	100		1	1	0 20/40 thru bioptic
Indiana	200		1	1	1 20/40 thru bioptic
Iowa	70		0	0	0
Kansas	400		1	0	0 20/400 must seek specific approval
Kentucky	200		1	1	1 20/60 through bioptics
Louisiana	200		1	1	1 20/60 thru bioptic
Maine	70		1	0	0
Maryland	100		1	0	1 20/70 listed then say 20/100 on case by case
Massachusetts	100		1	1	0 20/40 thru carrier lense
Michigan	70		1	1	1 20/50 through bioptic Bbioptics not mentioned but if applicant requires bioptic dr must mention this on form. From IALVS site, "The statute does not specifically address use of bioptic telescopeglasses. The DMV allows their use if prescribed, and the patient has to have at least 20/80 through the TS and would be required to take a road test with the state to
Minnesota	99		0	1	1 determine further restrictions."
Mississippi	200		1	1	1 20/50 with telescope
Missouri	160		1		0 20/60 through carrier vague about acuity through telescope
Montana	100		1	0	0 20/100 if need is shown
Nebraska	200		1	1	1
Nevada	120		1	1	0 20/40 through telescope
New Hampshire	200	n/a	n/a		0 20/40 corrected bioptics not addressed
New Jersey	50	n/a	n/a		0 bioptics not addressed

Appendix G:
Resources Utilized by the Working Group

Copies of each resource are available upon request

List of Resources Utilized by the Working Group:

1. Clark, Nancy, An Evaluation of the Traffic Safety Risk of Bioptic Telescopic Lens Drivers, State of California, Department of Motor Vehicles Publication #Rss96-163; March, 1996
2. Cross, Jennifer Moren, McGwin, Gerald Jr., Rubin, Gary S., Ball, Karlene K., West, Sheila K., Roenker, Daniel L., and Owsley, Cynthia., Visual and Medical Risk Factors for Motor Vehicle Collision Involvement among Older Drivers, Br J Ophthalmology, 2009 March; 93(3): 400-404.
3. Review of Accident Rates, February 6, 1986, by Robert Dreher, MD, PA
4. Huss, Charles P., Low Vision Driver Education Training, Originally Printed in "Human Connections", Alumni Newsletter, College of Health and Human Services, Western Michigan University.
5. Huss, Chuck., Strowmatt, Chad., Bioptics and Driving, November 1-3, 2012 SWOMA Conference, Texas School for the Blind & Visually Impaired, Austin, Texas.
6. Janke, Mary and Kazarian, Gregory., The Accident Record of Drivers with Bioptic Telescopic Lenses, State of California, Research and Development Office, February 1983, Report 86, CAL-DMV-RSS-83-86
7. Study of Bioptic Lens Drivers, 1976 – 1982, Maine Bureau of Motor Vehicles
8. Past and Future for Telescopic Lens Use, April, 1980, New York State, Department of Motor Vehicles
9. Owsley, Cynthia and McGwin, Gerald Jr., Vision and Driving, Optom Vis Res. 2010 November 23; 50(23): 2348-2361.
10. Owsley, Cynthia., Driving with Bioptic Telescopes: Organizing a Research Agenda, Optom Vis Sci. 2012 September; 89(9): 1249-1256.
11. Peli, Eli., Driving with Low Vision: Who, Where, When, and Why, www.eri.harvard.edu/faculty/peli/papers/Ch401-X0016.pdf
12. Woo, Stanley., Bioptic Telescopic Spectacles and Driving. http://www.thevisioncouncil.org/magnify/content_935.cfm
13. Wood, Joanne M., McGwin, Gerald Jr., Elgin, Jennifer, Searcey, Karen, Owsley, Cynthia., Characteristics of On-Road Driving Performance of Persons With Central Vision Loss Who Use Bioptic Telescopes, 2013 www.iovs.org
14. American Academy of Ophthalmology, Policy Statement, Vision Requirements for Driving, March 2006.
15. American Association of Motor Vehicle Administrators, Bioptic Lens Survey (FL by FL) 10-11.
16. American Association of Motor Vehicle Administrators, Survey on Below-Standard Visual Acuity and Telescopic (Bioptic) Lenses (Information obtained for Quebec – Last updated 02/05/13).
17. American Association of Motor Vehicle Administrators, Survey on Bioptics (Information obtained for Montana - Last updated 05/24/10).
18. American Optometric Association, Statement on the Use of Bioptic Telescopes for Driving, October 2009.