MINUTES OF THE
MEETING OF THE SENATE COMMITTEE
ON FINANCE

SIXTY-FIRST SESSION
NEVADA STATE LEGISLATURE
April 20, 1981

The Senate Committee on Finance was called to order by Chairman Floyd R. Lamb at 8:04 a.m., on Monday, April 20, 1981, in Room 231 of the Nevada State Legislature Building, Carson City, Nevada. Exhibit A is the Meeting Agenda. Exhibit B is the Attendance Roster.

COMMITTEE MEMBERS PRESENT:

Senator Floyd R. Lamb, Chairman
Senator James I. Gibson, Vice Chairman
Senator Eugene V. Echols
Senator Norman D. Glaser
Senator Lawrence E. Jacobsen
Senator Thomas R. C. Wilson
Senator Clifford E. McCorkle

COMMITTEE MEMBERS ABSENT:

(None)

STAFF MEMBERS PRESENT:

Ronald W. Sparks, Chief Fiscal Analyst
Dan Miles, Deputy Fiscal Analyst
Tracy L. Dukic, Secretary

OTHERS PRESENT:

(Please see Exhibit B)

The meeting of the Senate Committee on Finance was called to order by Chairman Floyd R. Lamb at 8:04 a.m. The meeting began with a presentation made by Mr. Charles Wolff, Warden of the Nevada State Prison System, on Assembly Bill #212.

ASSEMBLY BILL 212

> This bill makes a supplemental appropriation to pay travel expenses of employees who commute to the Southern Nevada Correctional Center.

Mr. Wolff began by explaining the need for this legislation and stated that the cost of this bill was estimated on a daily rate of $6.00 per day per employee for their round trip commute from their home to the new prison facility located in Jean, Nevada. He emphasized that the need for Assembly Bill 212 arises out of the fact that there is no permanent housing now being provided at the Jean facility; that it is necessary for employees to commute back and forth every day in order to work there.

Senator Lamb surmized that this bill did not contain any requests for additional salaries; that the salaries are comparable with other State facilities.

Mr. Wolff replied that that was correct.

Mr. Sparks noted for the Committee's edification that the bill had been amended down to the sumn of $55,000.

Senator Glaser asked if the reimbursement of employees for their travel expense to and from work has cut down on the turnover rate at this facility.

Mr. Wolff replied that up until January of 1981, at which time this program was suspended, it had greatly reduced the turnover rate. He said that immediately after it was suspended the turnover rate began to increase again.

Senator Lamb asked Mr. Wolff if he feels that they are going to run into the same problem with the prison at Indian Springs.

Mr. Wolff replied that it is a daily commute, round trip, of approximately 75 to 85 miles per day, and they probably will.

Senator McCorkle asked if the money for this appropriation had been included in the prison budget for Indian Springs.

Mr. Wolff replied that it had been included.

Senator Jacobsen asked how many employees would be commuting back and forth to the prison.

Mr. Wolf indicated that there would be a total of 134 employees, and most of them would be involved in commuting from the Las Vegas area to the facility at Jean.

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ASSEMBLY BILL NO. 352

This bill provides for the reversion of money appropriated for punchard vote recording systems.

Making the presentation for Assembly Bill No. 352 was Mr. David Howard, Secretary of State's Office. He simply stated that all of the purposes proposed for the money appropriated have been accomplished, and they find no difficulty with the bill.

Senator Gibson asked how much money is left in the unappropriated balance.

Mr. Howard replied that there was $161,000.

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SENATE BILL NO. 512

This bill makes an appropriation for certain equipment for Fallon campus of Western Nevada Community College.

This will was presented by Senator Virgil Getto, Mr. Jack Davis, President of Western Nevada Community College and Mr. Ronald Martin, Western Nevada Community College.

Senator Getto said that this is a One Shot appropriation to equip the Fallon Community College campus with the necessary equipment to operate the new campus. The following is a breakdown of the items of expense:

1. $29,517.54 - Equipment for Business course instruction;

2. $20,000 - Equipment for Computer Science course instruction;

3. $7,032.95 - Equipment for Math and Adult Education instruction;

4. $92,666.55 - Equipment for the Agricultural, Auto Mechanics and Welding course instruction;

5. $11,160 - additional appropriation for the immediate support of the Fallon Community College campus.

Senator Getto said that the college campus is almost complete now and is a very modern facility. He said that they will be able to accomodate approximately 1,000 students or 160 students per hour, although at least two-thirds of the students remaining will be in different classrooms throughout the community.

Senator Glaser asked how many FTE's are presently at the Fallon Community College and how does the current enrollment compare with the enrollment projections made two years prior.

Mr. Davis replied that the current enrollment is ahead of the FTE projection that was made, and the enrollment had also been projected to increase at a rate of 10 percent per year, which it has already exceeded by 5 percent for the coming fall semester. He said that the FTE projections for the Fallon Campus were projected to be 200 with a total enrollment of 670 students, but he said that he feels it will be more like 240 FTE's and a total enrollment of 700 students.

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SENATE BILL 331

This bill provides for special financial assistance to school districts providing instruction for children in detention homes.

The presentation of this bill was made by Mr. Ted Sanders, Superintendent of Public Instruction. He told the Committee that the impact of this bill is coupled with the passage of five other bills which are being considered by the Senate and the Assembly, and he requested that the Committee hold any further action on this bill until such time as they might be able to compare and examine all the legislation involving this issue.

Senator Lamb agreed with this proposal and the Committee joined in accord.

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SENATE BILL 228

This bill requires red lights on emergency vehicles to be visible from all directions.

This bill was presented by Mr. Barton Jacka, Director of the Department of Motor Vehicles. For a complete explanation of Senate Bill 229, please refer to Exhibit C, Report to the Senate Finance Committee, Senate Bill 228, Emergency Vehicle Lighting.

Senator Wilson questioned the placement of deck-mount lighting on Highway Patrol vehicles in relation to their visability and, likewise, the safety of their placement on the inside of the rear window.

Mr. Jacka said that there is a psychological effect on motor vehicle operators which deters them from speeding when deck-mount lights are fitted on patrol cars. He also indicated that this lighting is more visible to motorists and can be seen at a greater distance. He added that the deck-mount lights are more economical to operate because there is less wind drag, thus, resulting in fuel economy, and they are less expensive to maintain.

Senator Glaser asked if there is not a safety factor in the hood-mounted lights because of their easy visibility to motorists.

Mr. Jacka replied that he does not believe that there is any greater safety factor in overhead lighting than there is to deck-mounted lighting. He said that the deck-mount lighting would not be involved in heavily conjested traffic areas but mostly on open road. He also said that oncoming traffic can see the lights from the front and the traffic from the rear can see the red light apparatus in the rear. Mr. Jacka said that he had found in his experience with the metropolitan police department that they had more patrol cars struck from the rear that were stopped and enforcing traffic regulations that had the overhead lighting than the slick-mount lighting system.

Senator Jacobsen asked Mr. Jacka how the Nevada Highway Patrol's issuance of citations compares with other states.

Mr. Zadra said that, per officer, Nevada is higher in citation average.

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SENATE BILL 497

This bill provides for immediate effectiveness of regulations, standards, and policies concerning State Welfare Administration under certain circumstances.

This bill was presented by Mr. Ace Martelle, Director of the Department of Human Resources, and Mr. John Duarte, Acting Administrator of the Welfare Division.

Mr. Duarte began his explanation of this bill by stating that this legislation would give the Welfare Administration the flexibility, if there is a cutback or a need to maintain any kind of budget restraint, to work in conjunction with the Director of the Department of Administration to take action

for policy and regulation without going directly to the Welfare Board. This would preclude the necessity of having to receive authority from the Welfare Board in order to make adjustments in the average grants or to make adjustments in the payment schedules. He indicated that this would transfer authority over budget restraints to the administrators of the Welfare Division.

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SENATE BILL 538

This bill revises provisions on Aid to Dependent Children, State supplementary assistance to the aged and blind persons and assistance to medically indigent.

Mr. Duarte explained that this bill does primarily consolidate the Welfare Division present operations into one portion of law. It will basically eliminate NRS 425, a portion thereof, 427 and 428. It does provide for certain abilities to allow the Division to make changes that are necessary to stay within the budget constraints as they are prescribed by the Federal Government. It does eliminate the restrictions of the Title XIX Law and allows the Division greater flexibility in this area.

He called the Committee's attention to page 7 of the bill, the State supplemental assistance for the aged and blind. He said that presently the program is funded on an aggregate basis where they are obliged to fund the program with the same amount of money as they have spent for the previous year, which is imposed by Federal law. He said that the only time the Welfare Division would not spend more money is if the Welfare caseloads declines.

Senator Lamb said that they are not expecting the caseload to decline.

Mr. Duarte replied that they are not.

Senator Gibson asked why they are writing the medically indigent into this bill.

Mr. Duarte replied that this is being done because, as prescribed under Section 22 of the Title XIX law, this is one of the four programs that is combined into the Title XIX Program.

Mr. Martelle said that he and his staff had all reviewed the proposed legislation, and they feel that this will give the Welfare Division full authority to implement and exercise restraints on the budget.

Senator Gibson asked if Mr. Duarte or Mr. Martelle are aware of any changes in the proposed 5 to 6 percent cap that the new administration has set forth.

Mr. Duarte replied that he has been informed that the cap will be at 5 percent.

Mr. Martelle said their intent was to give themselves flexibility so as not to have to have a special session of the Legislature. He said that as far as block grants for Title XIX are concerned, they will be receiving approximately $5 million dollars less in 1982 than what the Welfare Division requires under the Governor's appropriation. He said that, if and when the block grants are intact, he had hoped to return to Interim Finance with a plan enumerating exactly how much money the Welfare Division does have.

Senator Wilson noted there is a conflict in Senate Bill 538, Section 6, on line 17 and, also, in Section 7 on lines 32 through 34 and Senate Bill 497, Section 2, Subsections (a), (b) and (c) as to who shall hold the authority over decisions regarding policies, standards and regulations. He also asked what the Welfare Division would do if there was not a consensus between the Board and the Welfare Division.

Mr. Martelle explained that he feels the language in the two bills is specific enough to spell out the authority of each faction; that Senate Bill 497 specifically gives the authority to the administrator of the Welfare Division and the State Budget Officer to make whatever rules and regulations that are necessary in order to curtail over-spending.

Senator Wilson asked if there was not a jurisdictional conflict.

Mr. Martelle replied that there is not; that he does not anticipate any. He said their primary goal was to make certain that the administrator and the State Budget Officer had the final authority in cases where there may be a potential conflict over the overexpenditure of funds; therefore, the State Board could not overrule their decision. Mr. Martelle stated that if Senator Wilson has some language that he could offer in order to better clarify the intent of these two bills, the Division would be more than happy to receive it. He also offered to speak with Frank Daykin in regard to this matter and return to the Committee with their findings.

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SENATE BILL 480

This bill makes a special provision for service charges in unclaimed property.

This bill was presented by Mr. Jim Eaton, representing First National Bank of Nevada, Mr. Gib Newton, Nevada National Bank, and Mr. Pop Watson,

Mr. Eaton indicated that this bill would amend the Uniform Disposition of Unclaimed Property Act which would help the banking industry in trying to decide a reasonable means to comply with that section that applies to determining the retroactivity of administrating the Act as if it had been in effect ten years prior to its effective date, January 1, 1980.

He said that the legislation deals with the section that covers the refunding of services charges levied on accounts which have been classified "inactive" by the bank. He said that banks heretofore have been required to refund the service charges to the account as well as refunding the service charges to the State for the prescribed period of seven years for retroactivity. But for those accounts going beyond this seven-year period, it is a problem. They are proposing, by this legislation, that the section be eliminated, but that a section be added to the NRS 123.10 to say that any such charge which was deducted or withheld prior to January 1, 1980 need not be located and recorded as long as the holder agrees to make any owner whole who comes forward later and makes claim to the money whether they apply to the banking institution or to the State.

Senator Glaser asked what would happen if the holder cannot be located; then would this deduction be made available to the State.

Mr. Newton replied that in those cases where they have adequate records and know, in fact, that there was a bona fide holder, then they are not claimed as funds by the bank.

Senator Lamb asked who would determine whether or not the records were adequate to substantiate such a decision.

Mr. Newton replied that the Regulatory Authorities determine this through examination. He stated that this would only go into effect if the bank were in doubt as to whether or not there actually was a holder going beyond the statutory limit and whether or not he has received any of these funds.

Mr. Eaton interjected and explained further for the committee's edificiation the practies which have been followed by banking institutions in the State of Nevada for quite some time. He also added, in answer to Senator Glaser's earlier question, that when a holder could not be located, those service charges levied on his account would not be refunded; that they would remain in the earnings of the bank. He said that this was practiced on a national and state level. He said that they are merely suggesting that this practice not be made retroactive as of January 1, 1980, when all banking institutions in Nevada stopped charging these accounts until the law was rectified.

Mr. Eaton indicated that the tremendous cost of researching their records in order to find the original holders is a horrendously costly task.

Senator Lamb asked if there was not a certain amount of expense involved in handling these accounts.

Mr. Eaton replied that there is, and that many of the accounts, once they become inactive, become more expensive to handle because the particular bank's audit department becomes responsible for examining every transaction made in this account hereafter.

Senator Jacobsen asked if this was not an area of abuse in the banking business--illegal transfer of funds.

Mr. Newton indicated that this has been known to happen, but that it does not happen frequently. He said that the bank places strict controls on these accounts to prevent the possibility of embezzlement.

Senator Jacobsen asked when an account becomes inactive who would determine this.

Mr. Eaton replied that under the newly revised statutes, the statute itself would prescribe when the account would be eligible for inactive status.

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Senator Lamb presented the committee with a Bill Draft Request which is an act relating to the Central Data Processing Fund providing for a working capital fund of $1 million dollars.

SENATOR GIBSON MOVED TO INTRODUCE THE BILL.

SENATOR WILSON SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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SENATE BILL NO. 417

SENATOR GLASER MOVED TO AMEND AND APPROVE SENATE BILL NO. 417.

SENATOR WILSON SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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SENATE BILL NO. 480

SENATOR GIBSON MOVED TO APPROVE SENATE BILL NO. 480.

SENATOR ECHOLS SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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SENATE BILL NO. 228

SENATOR JACOBSEN MOVED NOT TO APPROVE SENATE BILL NO. 228.

SENATOR MCCORKLE SECONDED THE MOTION.

THE MOTION CARRIED WITH THE EXCEPTIONS OF SENATORS GIBSON AND GLASER'S DISSENTING VOTES.

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SENATE BILLS NOS. 497 & 538

THE COMMITTEE DECIDED TO HOLD FURTHER ACTION ON THESE BILLS UNTIL A LATER DATE.

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SENATE BILL NO. 512

THE COMMITTEE DECIDED TO HOLD FURTHER ACTION ON THIS BILL UNTIL A LATER DATE.

ASSEMBLY BILL NO. 352

SENATOR GIBSON MOVED TO APPROVE ASSEMBLY BILL NO. 352.

SENATOR GLASER SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

ASSEMBLY BILL NO. 212

SENATOR JACOBSEN MOVED TO APPROVE ASSEMBLY BILL NO. 212.

SENATOR GIBSON SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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MANSION MAINTENANCE, page 4

SENATOR GLASER MOVED TO PLACE $20,000 IN THE MANSION REFURBISHING BUDGET.

SENATOR MCCORKLE SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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SENATOR JACOBSEN MOVED TO APPROVE THE BUDGET AS AMENDED.

SENATOR ECHOLS SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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OFFICE OF OPERATIONAL ANALYSIS, page 6

SENATOR MCCORKLE MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR GLASER SECONDED THE MOTION.

THE MOTION CARRIED WITH THE EXCEPTION OF SENATOR LAMB'S DISSENTING VOTE.

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CRIME PREVENTION, page 14

SENATOR JACOBSEN MOVED TO TRANSFER THIS BUDGET ACCOUNT TO THE DEPARTMENT OF LAW ENFORCEMENT ASSISTANCE.

SENATOR GLASER SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

LIEUTENANT GOVERNOR, page 14

SENATOR MCCORKLE MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR JACOBSEN SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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PRIVATE DETECTIVE, page 40

SENATOR GLASER MOVED TO DRAFT A BILL TO INCREASE THE FEES TO PAY FOR SERVICES PROVIDED BY THE ATTORNEY GENERAL'S OFFICE.

SENATOR MCCORKLE SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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STATE CONTROLLER, page 50

SENATOR MCCORKLE MOVED TO APPROVE THE BUDGET BY ADDING TWO NEW ACCOUNTANT POSITIONS.

SENATOR JACOBSEN SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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BUDGET DIVISION, page 53

SENATOR JACOBSEN MOVED TO APPROVE THE BUDGET WITH THE EXCEPTION THAT THE PRE-AUDIT EXAMINER POSITION WAS DELETED.

SENATOR WILSON SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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MOTOR VEHICLE OPERATIONS DIVISION, page 88

SENATOR JACOBSEN MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR GLASER SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

STATE PRINTING OFFICE, page 97

THE COMMITTEE ELECTED TO HOLD THIS BUDGET FOR FURTHER ACTION.

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RECORDS MANAGEMENT SERVICES, page 101

SENATOR MCCORKLE MOVED TO ELIMINATE THE POSITION OF PHOTOCOPY REPRODUCTION SPECIALIST.

SENATOR ECHOLS SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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SENATOR GLASER MOVED TO APPROVE THE BUDGET AS AMENDED.

SENATOR JACOBSEN SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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DEPARTMENT OF ECONOMIC DEVELOPMENT, page 124

THE COMMITTEE ELECTED TO HOLS THIS BILL FOR FURTHER ACTION.

Senate Committee on Finance
April 20, 1981

PUBLIC WORKS BOARD, page 132

SENATOR JACOBSEN MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR ECHOLS SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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PUBLIC WORKS INSPECTION SECTION, page 135

SENATOR JACOBSEN MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR ECHOLS SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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INDIAN COMMISSION, page 148

SENATOR WILSON MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR JACOBSEN SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

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EMPLOYEE-MANAGEMENT RELATIONS BOARD, page 156

SENATOR GLASER MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR ECHOLS SECONDED THE MOTION.

THE MOTION CARRIED UNANIMOUSLY.

PUBLIC DEFENDERS, page 158

SENATOR JACOBSEN MOVED TO APPROVE THE BUDGET AS RECOMMENDED.

SENATOR GLASER SECONDED THE MOTION.

THE MOTION WAS CARRIED UNANIMOUSLY.

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There being no further business, the meeting was adjourned at 10:30 a.m.

Respectfully submitted by:

Tracy L. Dukic, Secretary

APPROVED BY:

Senator Floyd R. Lamb, Chairman

DATED: Apr. 28, - 81

SENATE AGENDA

COMMITTEE MEETINGS

Committee on FINANCE, Room 231.

Day (SEE BELOW), Date (SEE BELOW), Time 8:00 a.m.

MONDAY, APRIL 20, 1981

1. A. B. No. 212 - Makes supplemental appropriation to pay travel expenses of employees who commute to southern Nevada correctional center. (Charles Wolff)
2. A. B. No. 352 - Provides for reversion of money appropriated for punchcard vote recording systems. (William Swackhammer)
3. A. B. No. 228 - Requires red lights on emergency vehicles to be visible from all directions. (S. Barton Jacka)
4. S. B. No. 331 - Provides for special financial assistance to school districts providing instruction for children in detention homes. (Ted Sanders)
5. S. B. No. 512 - Makes appropriation for certain equipment for Fallon campus of Western Nevada Community College. (Senator Getto)
6. S. B. No. 497 - Provides for immediate effectiveness of regulations, standards, and policies concerning State Welfare Administration under certain circumstances. (Ace Martell)
7. S. B. No. 538 - Revises provisions on aid to dependent children, state supplementary assistance to aged and blind persons and assistance to medically indigent. (Ace Martell)
8. S. B. No. 480 - Makes special provision for service charges in unclaimed property.

TUESDAY, APRIL 21, 1981

1. A. B. No. 26 - Provides for optional program of additional contributions under the Public Employees' Retirement System. (Vernon Bennett)
2. A. B. No. 154 - Makes various changes in law concerning retired public employees. (Vernon Bennett)
3. A. B. No. 287 - Increases salary of legislators for service in interim retirement committee. (Vernon Bennett)

WEDNESDAY, APRIL 22, 1981

1. Closing of Budgets.

THURSDAY, APRIL 23, 1981

1. Closing of Budgets.

FRIDAY, APRIL 24, 1981

1. Closing of Budgets.

ATTENDANCE ROSTER FORM

COMMITTEE MEETINGS

SENATE COMMITTEE ON FINANCE

DATE: April 20, 1981

PLEASE PRINT NAME	PLEASE PRINT ORGANIZATION & ADDRESS	PLEASE PRINT TELEPHONE
Virgil Getto	Senator	423-3544
Pete Ladd [illegible]	DMV. Highway Patrol	885-5310
Ted Sanders	Dept of Educ	885-5700
Bart Jacka	DMV	885-5375
John R. Duarte [illegible]	Welfare Division	885-4778
Thomas Hodson	Valley Bank	386-1225
Ray Martin	WNCC - Fallon Campus	423-6500
Jack Davit	WNCC	885-4817
C. Thomas	Washoe Co [illegible]	785-5611
Mar Shelton	Washoe County Welfare	785-5611
Ed [illegible]	[illegible] - Jail	[illegible]3-758
David L. Howard	Sec of State	5203
Frank [illegible]	Youth Services	5902
Bill Lewis	Carson City Juvenile Probation	882-2736
[illegible]	Carson City Juvenile [illegible]	[illegible]

1/81:cf

REPORT TO

SENATE FINANCE COMMITTEE

~~February 12~~, 1981
APRIL 20.

S.B. 228

EMERGENCY VEHICLE LIGHTING

PREPARED BY

NEVADA HIGHWAY PATROL

INDEX

FORWARD

This handout is a compilation of many studies dealing with the use of emergency lighting systems, both bumper mounted and overhead lighting. The economics of using each is dealt with from the standpoint of both initial cost as well as continued operation. The safety aspects are addressed in two reports dealing with intersection accidents and historical data on slick top vehicles versus overhead lighted patrol units which have been involved in accidents. Pages are also attached giving descriptions of the various lighting units used by the Highway Patrol. Figures used in this handout are based on mid-size lighting for the mid-size vehicles the Patrol will begin using in May of this year with the acquisition of the Chrysler LeBaron as a patrol car.

The Highway Patrol's decision to remove the light bar from the top of Patrol vehicles has been under consideration for approximately 18 months. Four main factors were involved in the decision making process:

1. Fuel and vehicles operating costs
2. Vehicle performance
3. Lack of funds to replace lighting systems
4. Safety considerations in emergency vehicle lighting systems

After approximately 6 months of consideration the following steps were decided upon:

1. As light bars become inoperative replace them with the old NHP deck/spot light lighting systems.

2. As vehicles were replaced; replace the lighting system with the deck/spot light system.

3. Run tests on various lighting systems to arrive at a final decision on a lighting system that provides:

    A. Safety
    B. Economy
    C. Operating efficiency

484.261 Authorized emergency vehicles.

1. The driver of an authorized emergency vehicle, when responding to an emergency call or when in pursuit of an actual or suspected violator of the law or when responding to but not upon returning from a fire alarm, may exercise the privileges set forth, subject to the conditions stated, in this section.

2. The driver of an authorized emergency vehicle may:

(a) Park or stand, without regard to the provisions of this chapter.

(b) Proceed past a red or stop signal or stop sign, but only after slowing down as may be necessary for safe operation.

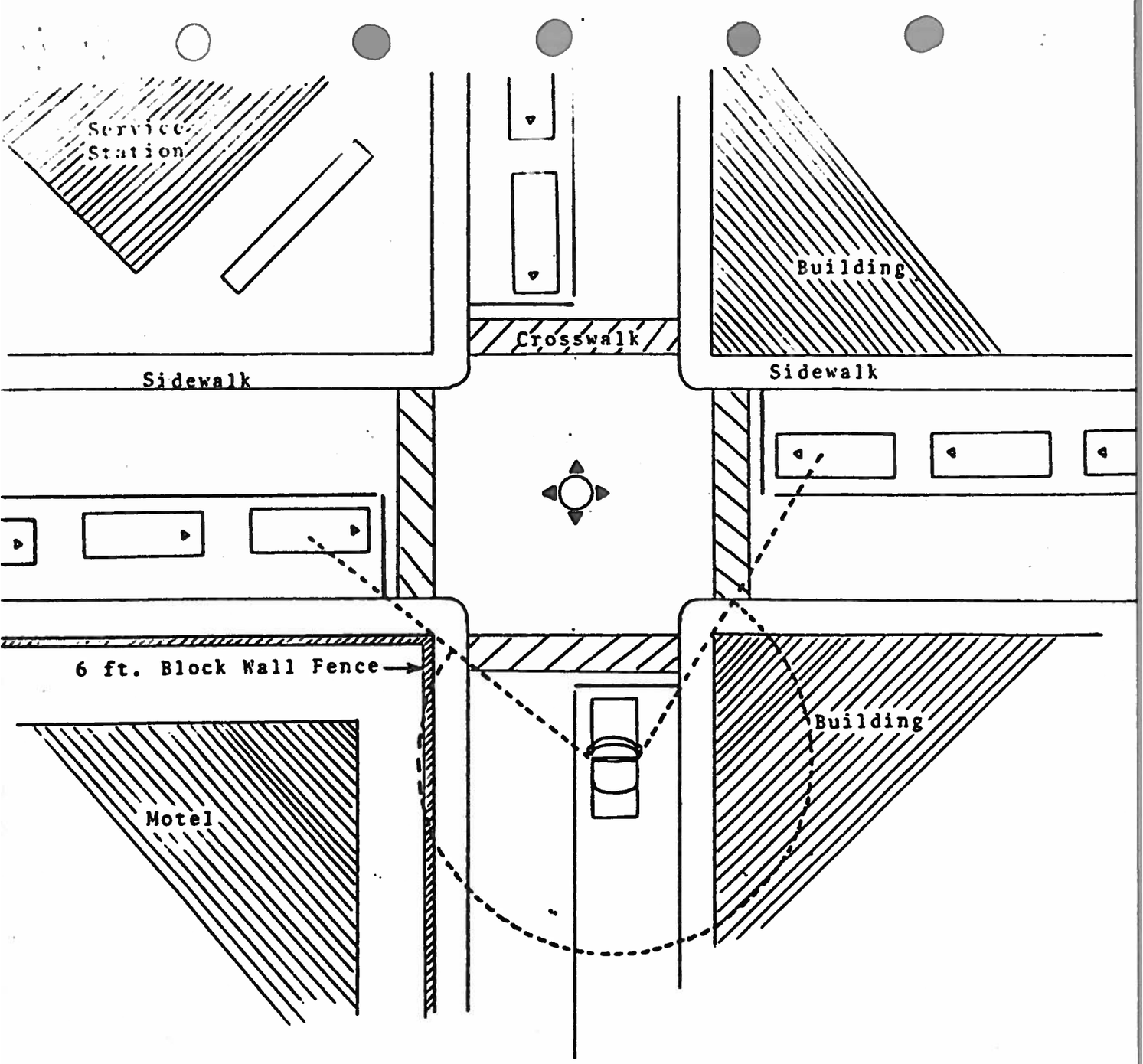
(c) Exceed any speed limits so long as he does not endanger life or property.

(d) Disregard regulations governing direction of movement or turning in specified directions.

3. The exemptions granted in this section to an authorized emergency vehicle apply only when such vehicle is making use of audible and visual signals as required by law.

4. The provisions of this section do not relieve the driver of an authorized emergency vehicle from the duty to drive with due regard for the safety of all persons, and such provisions do not protect the driver from the consequences of his reckless disregard for the safety of others.

(Added to NRS by 1969, 1506)



As indicated by the above diagram, 75 percent of the 360 degree emergency flashing red light is not utilized and therefore wasted at intersection situations during an emergency response.

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 1981

To: Colonel Peter J. Zadra, Chief

From: Sgt. John Harney, Commander, Support Services

Subject: OVERHEAD LIGHTS

The Nevada Highway Patrol currently has 176 marked patrol units assigned in the field. There are 14 authorized spare units and 5 marked pick-up trucks which are unassigned marked patrol units. This totals 195 vehicles which would require lighting in the Highway Patrol fleet.

There are 120 full size light bars either on units or available for installation.

The current quoted price per mid-size overhead lights effective March 15, 1981, is $681.32. Total cost to install on all 75 marked units currently without overheads would be $51,099.00.

As vehicles are downsized, the other 120 patrol units would need the mid-size light bars to replace the larger ones. Each year, 1/3 of the fleet is replaced and as a result of the downsizing of vehicles, as many as 40 units with overheads may have to have these replaced at a minimum cost of $27,253.00 a year for the next 3 years.

The estimated cost to add overhead lights would be:

	FY 81/82	FY 82/83
Install on units w/o overheads	$51,099.00	-0-
Replace current lights (1/3 of fleet)	$27,253.00	$31,340.00*
Increased fuel costs	$21,017.00	$24,169.00*
TOTAL	$99,369.00	$55,509.00

For two years, $154,879.00 minimum needed to reimplement overheads on total fleet, equipment and operating costs.

What is difficult to calculate are the effects that the decrease in performance of the patrol units will have on the Officer's ability to apprehend violators or the increased cost to the Division as a result of added wear and tear on the patrol car engines.

* Reflects 15% inflation factor.

JH:pc

STATE OF NEVADA

DEPARTMENT OF MOTOR VEHICLES

O-303

MEMORANDUM

March 11, 19 81

To Capt. Eric Hatch, Commander

General Services Bureau

From Sgt. John Harney, Commander, Support Services

Subject: DOWNSIZED VEHICLES/DOWNSIZED LIGHT BARS

According to Mr. Bill Dreer, Chrysler Corporation, as per our conversation 3-10-81, stated "1982 will be the last year for Chrysler's full size cars."

According to Mr. Fred Donnelly, Chevrolet Motor Division, General Motors Corporation, stated "The last year for the full size cars for the bulk of the industry is 1982. The reason is the Federal EPA requirement of 27 MPG average fuel consumption. The industries response is smaller and lighter cars. The day of the full size car is nearly over. The Impala and Caprice will not be on the market after the 1982 model year."

Vehicles are being downsized from full-size to mid-size. Roof widths are changing from 55" to 50" and smaller. The Patrol will be driving a Chrysler LeBaron in 1981. It's roofline is 49 3/4". As vehicles are downsized, it will be necessary to replace the large 52 9/16" light bar with the intermediate size light bar which is 47 9/16".

Several factors appear when a full-size light bar is placed on a mid-size vehicle. Special brackets and repositioning of the lights are required to minimize the hazard of an overhang of lights on the vehicle. There is added drag because, according to Mr. Mike McConnell (Signal Engineering Corporation), "the wind drag factor will have different effects on different vehicles. There will be more effect on a down-sized vehicle than a full-size vehicle because with a full-size bar percentage wise, it is larger. A full-size light bar has 13 lbs. of drag compared with 12 lbs. of drag on a mid-size light bar. Using a mid-size light bar creates a 6% improvement in the wind drag factor." "Using the mid-size bar with new grill would save 88 gallons of fuel per year, per unit, over the use of the full-size light bar Aerodynic model currently used by the Nevada Highway Patrol."

Information obtained on 3-11-81 from Engineering Department of Signal Corporation via phone conversation with Engineers Mike McConnell and Paul Graham who extrapolated for the Division.

JH:pc

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 1981

To: Sgt. John Harney, Commander
Support Services Section

From: Trooper Larry Davis, Staff Assistant

Subject: COST: OVERHEAD LIGHTS

At present, the Nevada Highway Patrol utilizes the Federal Aerodynic Overhead Light Model 24 EH. This light system is designed to accomodate full size vehicles (Plymouth Fury, Chevrolet Impala).

In order to cut operating costs, the Nevada Highway Patrol has found it necessary to move to a mid-size patrol vehicle (Chrysler LeBaron).

The Nevada Highway Patrol currently has 195 marked patrol units operating on the State's roadways. 75 of these units are "slick roof" models. In order to outfit the above "slick roof" models, the following retail costs are listed for one overhead light and the needed components. The model #24MEH Federal Aerodynic light system was chosen as it is adaptable to mid-size vehicles.

$557.25 Federal Aerodynic, Model 24MEH

$ 65.50 Model 2YHK roof mount brackets

$ 15.15 Model 125-12Y Kayolab flasher unit for amber lights

$ 43.42 Labor for installation

$681.32 TOTAL

Prices reflected are current retail prices effective March 15, 1981.

The cost to add overhead lights:

	Fiscal Year 81/82
Install on units without overheads (75 units total) x $681.32 =	$51,099.00
Increased fuel costs - 75 units x $280.23 =	$21,017.00
40 units - install overhead lights on units as replacements =	$27,253.00
TOTAL =	$99,369.00

	Fiscal Year 82/83
40 units =	$31,340.00
Increased fuel costs =	$24,169.00
TOTAL =	$55,509.00

	Fiscal Year 83/84
40 units =	$36,041.00*

Fuel cost unknown

*Indicates a 15% inflationary cost increase.

LD:jh

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To Capt. Eric J. Hatch, Commander

General Services Bureau

From Sgt. John Harney

Subject: EMERGENCY OVERHEAD LIGHTS

The following figures reflect the total number of emergency overhead light bars necessary to equip Nevada Highway Patrol vehicles.

180 A. Commissioned personnel

- 4 B. Commissioned personnel not requiring overhead lights.

1. Chief - One (1)
2. Deputy Chiefs - two (2)
3. Unassigned Staff Vehicle - One (1)

176 Total vehicles for commissioned personnel requiring overhead lights, less four staff vehicles.

+14 C. Total number of spare vehicles (standby available units for use when regular units are removed from service for maintenance, repairs, etc.)

+ 5 D. Total number of vehicles required for Special Officers (engaged in commercial and registration enforcement.)

195 Total number of overhead lights required to equip entire Nevada Highway Patrol fleet.

At present, the Nevada Highway Patrol has 120 sets of overhead lights in operation.

75 sets of overhead lights will be needed to equip the remaining fleet if the Patrol must return to overhead lights.

The current price for installed overhead lights effective March 15, 1981, is $681.32 per unit.

As Highway Patrol units are downsized (full size vehicles to mid size vehicles), it will be necessary to begin outfitting the mid size vehicles with smaller light bars.

This process would involve replacing approximately one third of the fleet's overhead lights at an additional expense.

JH:jdh

DMV 13 STATE OF NEVADA G-303

DEPARTMENT MOTOR VEHICLE

MEMORANDUM

March 11, 1981

To: Captain Eric J. Hatch, Commander

General Services Bureau

From: Trooper Larry Davis

Subject: EMERGENCY LIGHT SYSTEM COST

The cost of the Noren Red-Eye Bumper Mount/rear deck light/spotlight system currently being tested is $253.93 per unit installed.

PARTS AND PRICE BREAKDOWN

Noren Red-Eye Bumper Mount Lights	$ 94.90 per set
Noren Tri-Bryt Red and Deca Blue Seal Beam Lights	$ 55.42
Mounting Bracket	$ 2.61
Dietz Deck Light Housing	$ 40.00 per set
Flasher used with Unit	$ 30.30 per set
TOTAL PARTS	$223.23
INSTALLATION COST	$ 30.70 3½ hours installation time
TOTAL	$253.93

PRODUCT REFERENCES

The Noren Red-Eye Bumper Mount Light System and Noren Tri-Bryt Red and Blue sealed beam lights were purchased from:

National Safety Products
5305 N. 7th St., Suite #1
Phoenix, Arizona 85014
Attention: Mr. John Beddome
(602) 274-7900

The Dietz Deck Lights were purchased from:

California Electronic Police Equipment Co.
1627 E. Edinger Ave., Unit C
Santa Ana, California
(714) 543-9218

The Flasher Unit, Kayolab Model 125-12V was purchased from:

Macchi Corporation
819 Valencia Street
San Francisco, California

AERODYNIC OVERHEAD LIGHT SYSTEM

The cost of the Aerodynic Overhead Light System, (prices effective March 15, 1981) is $681.32.

PARTS AND PRICE BREAKDOWN

Federal Aerodynic, Model 24 MEH	$557.25 each
Roof Mount Brackets, Model 2YHK	$ 65.50 per set
Flasher used with Unit	$ 15.15 one each
TOTAL PARTS	$637.90
TOTAL LABOR	$ 43.42 @ 4½ hours
TOTAL	$681.32

* Above parts prices were quoted by:

Mr. John Gardner
Federal Signal Corp.
160 Saratoga Ave., Suite #36
Santa Clara, California
(408) 247-9694

FUEL COSTS

Using slick roof Patrol vehicles, fuel costs would be reduced by 10%. The dollar savings per year starting with next year's budget would be $57,167.00 combined 4713/4707 budgets. This figure is for the entire fleet and reflects a $280.23 savings per unit.

LD:jh

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 12, 1981

To: Captain Eric J. Hatch, Commander
General Services Bureau

From: Sergeant John Harney, Commander, Support Services JH

Subject: EMERGENCY LIGHT SYSTEM COSTS TEST SYSTEM

The Highway Patrol operates an authorized fleet which includes 195 vehicles which have emergency light systems. The cost of the Noren Red-Eye bumper mount/rear deck light/spotlight system currently being tested is $253.93 per unit installed. Three test systems are mounted on Patrol units. At this time, 72 other vehicles are equipped with red spotlights and rear deck lights and 120 vehicles with overhead lighting.

If implementation of this system were effective in July 1981 for all 195 vehicles requiring lights, the total cost would be $45,874.56.

Cost Breakdown:		
3 vehicles x 0	=	0.00
72 vehicles x $213.93	=	$15,402.96
120 vehicles x $253.93	=	$30,471.60
TOTAL	=	$45,874.56

If implementation of the lighting system were over a two year period total cost would be $49,315.15.

Cost Breakdown:		
96 vehicles in FY81	=	$22,937.28
96 vehicles in FY82	=	$26,377.87*
TOTAL	=	$49,315.15*

* Reflects a 15% inflation factor

JH:jh

ROBERT LIST
Governor

STATE OF NEVADA

BARTON JACKA
Director

DEPARTMENT OF MOTOR VEHICLES
555 WRIGHT WAY
CARSON CITY, NEVADA 89711
MOTOR CARRIER DIVISION
ENFORCEMENT BUREAU

S.B. 228

COST OF OVERHEAD LIGHTS

The cost of Aerodynic overhead light system installed on enforcement vehicle is $681.32.

The Motor Carrier Division Enforcement Bureau will operate thirty-seven (37) enforcement vehicles.

Light system cost	$ 681.32
Enforcement vehicles	37
Total Cost	$25,208.84

Note: Reduction in fuel efficiency is approximately 10% with overhead lights equal to $7,586.00 in operating costs.

DMV 13 STATE OF NEVADA

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To Colonel Peter J. Zadra, Chief
Nevada Highway Patrol

From Robert Dickerson

Subject: INSTALLATION COSTS AND TIME FOR LIGHTING SYSTEMS IN VEHICLES

	TIME HOURS	REGULAR
The time required to install a deck lamp and front lamp combination is as follows:		
1. Fabrication of brackets for mounting by mechanic and mount lights to brackets.	2.5	$21.05
2. Mount lights and wire up by radio technician.	1.0	$ 9.65
3. Two each alternating flashers (Kaylab Model 12S).		$30.30
4. Miscellaneous hook-up wire.		$ 1.00
5. Bracket materials and welding materials.	___	$ 2.61
TOTALS	3.5	$64.61
The time required to install an Aero-Dynic light bar (Manufactured by Federal Sign & Signal Co.) is as follows:		
1. Mount brackets to light bar, install siren speaker, install alternating flasher and re-wire.	1.5	$14.47
2. Install on vehicle and wire up.	3.0	$28.95
NOTE: If vehicle has a factory installed roof accessory cable (6 conductor, 12 guage) from the dashboard center to the roof center, installation time is approximately 1 hour less.		
3. Installation is made by radio technicians.		
4. One each flasher, model 12S.	___	$15.15
TOTALS	4.5	$58.57

RHD:jh

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To COLONEL PETER J. ZADRA

From ROBERT DICKERSON RHD

Subject: REPAIR OF VEHICLE LIGHT SYSTEMS

The current drain specifications for the two types of vehicle light systems is as follows:

1. Aero Dynic overhead.

   a. Amber only - 4 amps
   b. Amber and red solid - 9 amps
   c. Red solid and rotating reds - 30 amps
   d. Above and spotlight - 32.5 amps

2. Deck and front lamp.

   a. Rear alternating - 8 amps
   b. Front and rear alternating - 18 amps
   c. Above and spotlight - 24 amps

The repair times are as follows:

	APPROXIMATE TIME
1. Aero Dynic system.	
a. Lamp changes	30 min.
b. Gear changes	1 hour
c. Replacement of light bar due to mechanical failures	3 hours
d. Flasher change	15 min.
2. Deck light system.	
a. Lamp changes	15 min.
b. Flasher changes	15 min.

The Aero Dynic Light System has 8 spotlights, 4 Halogen rotating lights, 9 gears, and 1 motor assembly that are prone to failure. The replacement gear units (individual) are approximately $24.00 each. The spotlights are approximately $4.85 each. The Halogen lamps are approximately $8.75 each.

RHD/ne

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 1981

To: Col. Peter J. Zadra, Chief
Nevada Highway Patrol

From: Capt. Eric J. Hatch, Commander, General Services Bureau

Subject: FUEL CONSUMPTION COMPARISON TESTS ON OVERHEAD LIGHTS

It is a well known fact that vehicles are designed aerodynamically for efficient fuel use. The more the vehicle is altered externally with any type of obstruction or design change, the fuel use will increase, along with the drag factor on the vehicle. Ford engineering has stated that in most cases pulling a light weight trailer is more efficient than putting luggage on a roof rack.

Contact was made with various agencies and the most recent and compatable testing was done by the California Highway Patrol on October 23, 1980. See attached tests. In miles per gallon the percentage of efficiency compared to the baseline (slick top vehicle) decreased as mileage increased using the various types of overhead lights - Whelen, Smith & Wesson, Aerodynic #1, Aerodynic #2, and baseline. The most fuel efficient means of operating the patrol vehicle would be to operate it without any overhead lights which result in increased drag factor and cause miles per gallon to decrease. However, since this study compared the various types of lighting systems to no overhead lights at all, the next most fuel efficient means of an overhead lighting system was the Federal Aerodynic model 24 EH-M with a modified speaker grille #24SG.

We are presently using an Aerodynic light bar. Using the type of red lights that we presently have, the percentage of efficiency lost is 4.22% at 50 mph., 6.44% at 60 mph., and 9.04% at 70 mph. These figures were confirmed through a telephone conversation with Mr. Bob Shepherd, California Highway Patrol Technical Engineer, Sacramento, California, March 10,1981 at 0900 hours.

On 3-10-81 at 0930 hours, Sergeant Robert Harshman of the Arizona Department of Safety Planning and Research, Phoenix, stated that based on a study completed in 1977 on a 1977 Plymouth with roof mounts, they averaged overall 6.9 miles per gallon with the roof mounted red lights and 9.2 miles per gallon without the roof mounts. This was an overall percentage efficiency of 75% compared to the baseline vehicle or a total of 25% difference over all.

A completed study on Trooper James Farmer's vehicle with a Twin-Sonic lighting system, along with his narrative report over the phone on 3-10-81 showed an increase from 12.4 miles per gallon to 13.2 miles per gallon. Percentage of change was 6.0%*increase in mileage per gallon without the Twin-Sonic lighting system. This study was taken over a period of nine months in all kinds of weather and all types of terrain.

*Figure revised 3-19-81

On March 11, 1981, a study was made with two identical vehicles, one with the Aerodynic light bar and one without the Aerodynic light bar. The 1979 Chevrolet Malibu without the overhead light bar averaged 26 MPG. The 1979 Chevrolet Malibu with the overhead lights averaged 14 MPG. The difference was a 46% increase in mileage per gallon for the vehicle without the overhead lights. It is interesting to note that these two vehicles were identical, however, as the vehicles get smaller, it is estimated the difference in gas mileage will go up. It also shows the necessity in reducing the size of the light bar as the vehicle size is reduced.

In summary, based on the various types of vehicles and drag factors along with the types of terrain travelled, a 10% decrease in miles per gallon will be realized by the vehicles used by the Nevada Highway Patrol with overhead lights.

EH:jh

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To MAJOR JAMES H. STRUEMPH

From TROOPER JAMES S. FARMER

Subject: EMERGENCY LIGHTING SYSTEM STUDY

All lighting systems were installed individually on a 1979 Chevrolet unit #443. Test period conducted from June, 1980, to March, 1981. Tests included emergency operation during:

1. Heavy traffic conditions day and night.
2. Light traffic conditions day and night.
3. Both good and adverse weather conditions.
4. Accident scenes.
5. Rural and urban traffic stops.
6. Vehicle performance including:
   1. Mileage attained per gallon.
   2. Vehicle speed and performance.
7. Traffic enforcement.

LIGHTING SYSTEMS STUDIED

CATEGORY

1. Twin sonic roof mounted flashing lights.
2. Red front mounted flashing spotlight operated in conjunction with a red and amber flashing deck lights.
3. Red front mounted flashing spotlight operated in conjunction with flashing red and blue mounted grill and deck lights.

EMERGENCY LIGHTING SYSTEM STUDY

CATEGORY

1. Twin sonic overhead lights.
2. Red front mounted spotlight operated in conjunction with deck mounted red and amber lights.
3. Red front mounted spotlight operated in conjunction with red and blue mounted grill and rear deck lights. (Halogen)

1. Twin sonic roof mounted flashing lights

   A. Heavy traffic conditions.
   Experienced little difficulty in emergency operations. Day light operation lights were not as effective as night operation due to lighting conditions. There was difficulty experienced in rotating lights not functioning in the rotation mechanism lights would freeze in one positon and

and thus become ineffective. This was found to be true mostly in low temperatures. Although they were found to malfunction during good weather.

2. Operated Satisfactorily during light traffic.

3. Weather conditions.

During snow storms the siren would pack with snow as well as snow accumulated on the front surface of the light bar which would obscure the effectiveness of these lights to the front to zero and absolutely silence the siren.

4. Accident scenes.

Daylight performed satisfactorily while used in conjunction with traffic cones, which were placed effectively to forwarn approaching traffic.

Night hours performed satisfactorily while used in conjunction with flares placed in effective areas to forwarn approaching traffic.

5. Traffic stops.

Performed satisfactorily both day and night hours as traffic stops are conducted on the road shoulders. One major fault noticed was that the curiosity of passing motorists slowing suddenly to observe the happenings, caused rearend accidents and many near accidents which occasionally involved a patrol unit and the motorist that had been stopped or was being assisted.

6. Vehicle performance.

Top speed attained 95 to 102 MPH. Mileage attained per gallon: 12.4.

CATEGORY

1. Red front mounted flashing spotlight with rear mounted flashing red and amber lights.

   a. Heavy traffic conditions experienced little difficulty in emergency operation both day and night. With the use of the spotlight, the operator was able to position the beam in the direction and angle desired.

   b. Light traffic conditions performed effectively and appeared to have a brighter beam than the roof mounted.

2. Weather conditions.

Lights do not obscure during snow storms as they can be adjusted when not in use and when in use snow does not accumulate on the hot seal beam.

3. Accident scenes.

Performed effectively when used in conjuction with the portable roof mount revolving red light and used with traffic cones during

lighted hours and flares during dark hours placed effectively to forwarn approaching traffic.

4. Rural and urban traffic stops.

   Performed satisfactorily more so than the roof mounted lights as the motorist approaching from the rear were sufficiently forwarned but eleviated the problem of the opposing traffic of "rubber necking", thus reducing the chances of a traffic collision.

5. Vehicle performance.

   Able to attain higher speeds - 110 - 115 MPH. Gas mileage attained: 13.2*

6. Traffic enforcement.

   No noticeable difference.

CATEGORY #3

Red front mounted flashing spotlight operated in conjunction with flashing red and blue mounted grill and deck light.

1. Heavy traffic conditions performed satisfactorily was both effective day and night. Lights are considerably brighter than the other lights studied. The contrast between the red and blue appeared to gain a quicker response from surrounding motorists.

2. Light traffic conditions performed satisfactorily. Has a farther beam range. On direct approach, these lights were more effective than others studied.

3. Weather conditions:

   Do not obscure during snow storms, the seal beam on the grill lights are of a high temperature when operated, thus melting the snow and the spotlight is adjustable to shield it from the elements when not in use.

4. Accident scenes:

   Were more effective than the other lights studied when used in conjunction with the portable roof mount revolving red light and used with traffic cones in the day light hours and flares during dark hours placed effectively to forwarn approaching traffic.

5. Rural and urban traffic stops:

   Resulted in the same satisfactory performance as the red/amber deck light, but were much brighter.

*Figure revised 3-19-81

6. Vehicle performance:

   Resulted with the same satisfactory performance and the red/amber deck and red spotlight.

7. Traffic enforcement:

   No noticeable difference.

SUMMARY:

The lighting systems discussed all have favorable and non-favorable aspects. What was considered in this study was safety, both to the motoring public and the officer.

Also considered was the performance and the operation cost of the vehicle. The roof mounted lighting system failure experienced resulted in the vehicle having to be taken to an electrical shop. This not only rendered the unit totally disabled for its purpose, but was costly in manhours. It also resulted in the repairs having to be made by a private firm which was costly to the Division. When the spot, deck and grill lighting system fail (which I did not experience), the only cost factor would be either a flasher or a seal beam which are rather inexpensive compared to the moving part failure to the rotating light system. Also the down time for the unit and the officer would be minimized as these items are in stock and can be easily replaced by the officer if need be.

The other main factor was fuel consumption. The same unit with the roof mounted light operated by the same officer under the same conditions attained 12.4 mpg. With these lights removed and the Category 2 and 3 lights installed, the milage increased to 13.2 mpg. Taking in consideration that this vehicle is operated 2500 to 3000 miles per month, the fuel savings a year would be :

1. On a distance of 30,000 miles a year: 147 gallons of gasoline.
2. On a distance of 36,000 miles a year: 176 gallons of gasoline.

Our Division policy clearly states that during emergency operation approaching or traversing an intersection, the operating officer will decrease his speed sufficiently to safely enter or cross the intersection, and if need be, stop. Common sense will guide that all people cannot hear sirens or observe an emergency vehicle quickly enough. This is why whether the vehicle is equipped with whichever system, the operator has to drive defensively.

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To Colonel Peter J. Zadra, Chief

From Sgt. John Harney, Commander, Support Services

Subject: OVERHEAD EMERGENCY RED LIGHTS

The following information was gathered from neighboring State Police and Highway Patrol agencies. The figures and costs reflected here should be considered as a base for cost comparison with the emergency lights the Nevada Highway Patrol utilizes.

At present, the Nevada Highway Patrol uses the Federal Aerodynic Overhead Light, Model #24EH. This light system has proven to be very effective:

1. The streamline design reduces wind resistance and drag, thus reducing gas consumption and engine wear.

2. The light display produced by this unit makes the motoring public aware of a hazardous situation without creating a distraction.

The present cost for the Aerodynic unit is $681.32 (price effective March 15, 1981). The prices reflected by other law enforcement agencies outside the State of Nevada indicate a cost figure from as far back as 1974. A number of the agencies listed here have reduced costs by purchasing needed equipment in bulk (150 - 500 items) at one time, or have updated the equipment on hand.

The Nevada Highway Patrol is limited both by the amount of items that can be purchased and the number of items that can be updated (equipment needed is placed on a bid basis with the lowest bidder awarded the contract).

States included in this study which have modified or eliminated their overhead light systems include Arizona, California and Utah.

In some instances (California) up to 60% of the patrol units have converted to a side spot light and rear deck light system. The reasoning behind the conversion varies but two factors stand out: reduce cost to the State for fuel and maintenance and increased enforcement of the traffic laws.

In order to achieve the above goals, several states have:

1. Removed overhead lights to increase fuel efficiency

2. Reduced the expense of equipping patrol vehicles by removing overhead light systems

3. Reduced vehicle maintenance costs created by additional wear and tear to vehicle engines and electrical systems (wind drag and power drain from lights)

4. Greatly increased traffic violator enforcement

All of the steps previously mentioned were an effort to reduce cost to the citizens and taxpayers in the states involved.

CALIFORNIA

A. The California Highway Patrol is in a transition period. In the congested metropolitan areas, the CHP is utilizing overhead lights. In the urban areas of California the patrol units are "slick roof" models. Approximately 60% of the California Highway Patrol units utilize a red side spotlight and rear deck lamps.

B. It should be noted here that a majority of the overhead light systems were purchased during 1973-74, Federal Twin Sonic Systems, Model 12.

1. Cost for overhead light system and mounting bracket - $275.00
2. Cost for PA system control box and siren - $120.00
3. Total Cost: This figure does not reflect cost of installation or upkeep on the above listed units - $395.00

C. California Highway Patrol places a majority of their equipment needs out to bid and realizes a savings of approximately 30 to 40% by purchasing in quantity.

D. Approximate cost of Federal Aerodynic Light Bar Model #24EH for CHP:

1. Average cost per overhead unit - $289.00
2. Average cost to install overhead unit - $40.00
3. Total: $329.00 - These prices do not reflect additional costs of control box units, PA systems, sirens or general upkeep of the overhead light unit - $300.00 approximate cost
4. $629.00 - Total cost for light bar, control box, siren, PA

E. Approximate cost for CHP to install rear deck and side spot light system - $95.00 (Price does not include control box, siren, PA)

F. Effects of overhead lights on vehicle speed and fuel consumption (approximately) (440 cubic inch engines):

1. 10-15 MPH - loss of top end speed at 100 MPH
2. 12 MPG - average fuel consumption
3. 10% - loss in fuel consumption
4. 10% - loss in top end speed

G. Type of patrol and pursuit vehicles (CHP)

1. 1978 Dodge Monaco "440"
2. 1978 Dodge Regis "318"
3. 1981 Dodge Diplomat "318"

NORTH LAS VEGAS POLICE DEPARTMENT

This police agency purchases a majority of their equipment on a bid basis, when reasonable and applicable, the equipment is purchased in quantity.

A. Smith and Wesson Model 7730 emergency lights purchased in 1978 (Twin bulb type)

B. Cost breakdown:

1. Cost for two bulb type lights (tinted covers, motors and mounts) $275.00
2. Cost for bracket and bar to mount lights - $50.00
3. Cost for siren and PA system - $100.00
4. Cost for two white alley lights - $60.00
5. Cost for control box - $100.00
6. Total cost - $585.00

The prices reflected above do not include the man hours required or additional hardware needed to install the light system.

UTAH

A. Type of patrol and pursuit vehicles:

1. 1978 Plymouth Fury
2. 1979 Chevrolet Impalas

B. Type of overhead light system and cost:

1. Utah currently utilizes various Federal overheads with a red side spot and rear deck lights for congested urban areas

$300.00 - average cost per overhead unit (comprised of older overheads)
60.00 - average cost to install unit
$360.00 - TOTAL

2. The rural area units use a magnetic roof mount Roto beam type light

$90.00 - approximate cost

C. Effects of overhead lights on vehicle speed

1. 10-12 MPH - loss of top end speed

ARIZONA

A. Type of patrol and pursuit vehicles:

1. 1978-79 Chevrolet Impala
2. 1980 Gran Fury
3. 1980 Chrysler LeBaron

B. Type of overhead light system and cost:

1. Federal Twin Sonic
2. No costs figures available

C. Arizona presently is using a combination push bumper mount red lights with red and amber rear deck lights

1. Cost - $73.90 for lights and $44.00 for installation

D. No tests or studies available on overhead vehicle performance with bumper and deck mounted light system

IDAHO

A. Type of patrol and pursuit vehicles:

1. 1979 Plymouth Fury
2. 1981 Plymouth Fury

B. Type of overhead light system and cost:

1. Code-3 - Blue to the front, amber to the rear

$300.00 - average cost per overhead unit
60.00 - average cost to install unit
$360.00

$300.00 - approximate cost for siren, control box and PA system

Total Cost - $660.00 - price for entire system

C. Idaho will remain using an overhead light system

D. No tests or studies available concerning effects of overhead lights on vehicle speed and performance (gas consumption)

JH:pc

CALIFORNIA HIGHWAY PATROL

FUEL CONSUMPTION TEST OF PATROL CAR
WITH VARIOUS ROOF LIGHT BARS

OCTOBER 23, 1980

PURPOSE:

This test was conducted to compare the fuel consumption of a patrol car with no warning light bar with that of the same car equipped with the Whelen model 80H-4, Smith & Wesson model 8800, Federal Aerodynic model 24EH-M with a standard speaker grille, and Federal Aerodynic model 24EH-M with a modified speaker grille #24SG.

PROCEDURE:

The 1980 Dodge St. Regis with 318 CID engine was selected as the test vehicle, E855599. A Laboratory Equipment Corporation fifth wheel with velocity and distance meters, model DD-1 and DD-2, were used for speed and distance measurements.

A Floscan flow meter model 606A was installed for measurement of fuel consumed. The instrument has a resettable digital counter which measured fuel consumed to .001 gallon. A start-stop switch built into the meter was used to syncronize the meter counter with the stop watch and the start and finish of test course.

The test site was the open, paved and flat 4-mile section of Interstate 5 north of Hood Road crossing south of Sacramento. The area provided ample space to run a 2.0 mile test distance at constant speeds. The test operation consisted of making runs in both north and south directions and recording the amount of fuel used on each run at constant speeds of 50, 60 and 70 MPH.

Test runs with no light bar mounted were conducted before and after the tests for control purposes, to check for possible variables and establish the baseline data.

Coast-down tests were conducted immediately following each fuel consumption test run. Coast-down distance and time were measured from the test speed to 20 MPH.

Weather conditions were stable with wind calm at 0 to 2 MPH from the southeast and temperature of 60° to 70°F. during the test.

RESULTS:

The results of the tests for each type light bar and baseline are shown below.

Vehicle Speed	Miles Per Gallon				
	Whelen	Smith & Wesson	Aerodynic #1	Aerodynic #2	Baseline
50 MPH	18.10	18.26	18.60	18.60	19.42
60 MPH	16.06	16.06	16.13	16.88	17.24
70 MPH	13.70	14.13	13.99	14.81	15.38

	% Efficiency Compared to Baseline			
50 MPH	93.20	94.03	95.78	95.78
60 MPH	93.16	93.16	93.56	97.91
70 MPH	89.08	91.87	90.96	96.29

Coast-Down Tests to 20 MPH

	Dist. ft.	Time sec.	Dist. ft.	Time sec.	Dist. ft.	Time sec.	Dist. ft.	Time sec.	Dist. ft.	Time sec.
50 MPH	2625	54.3	2925	59.6	2955	60.6	3070	63.6	3075	62.9
60 MPH	3535	65.5	3745	70.1	4010	70.9	4010	70.7	4030	74.8
70 MPH	4285	74.4	4610	78.8	4695	79.9	4780	81.6	4905	83.5

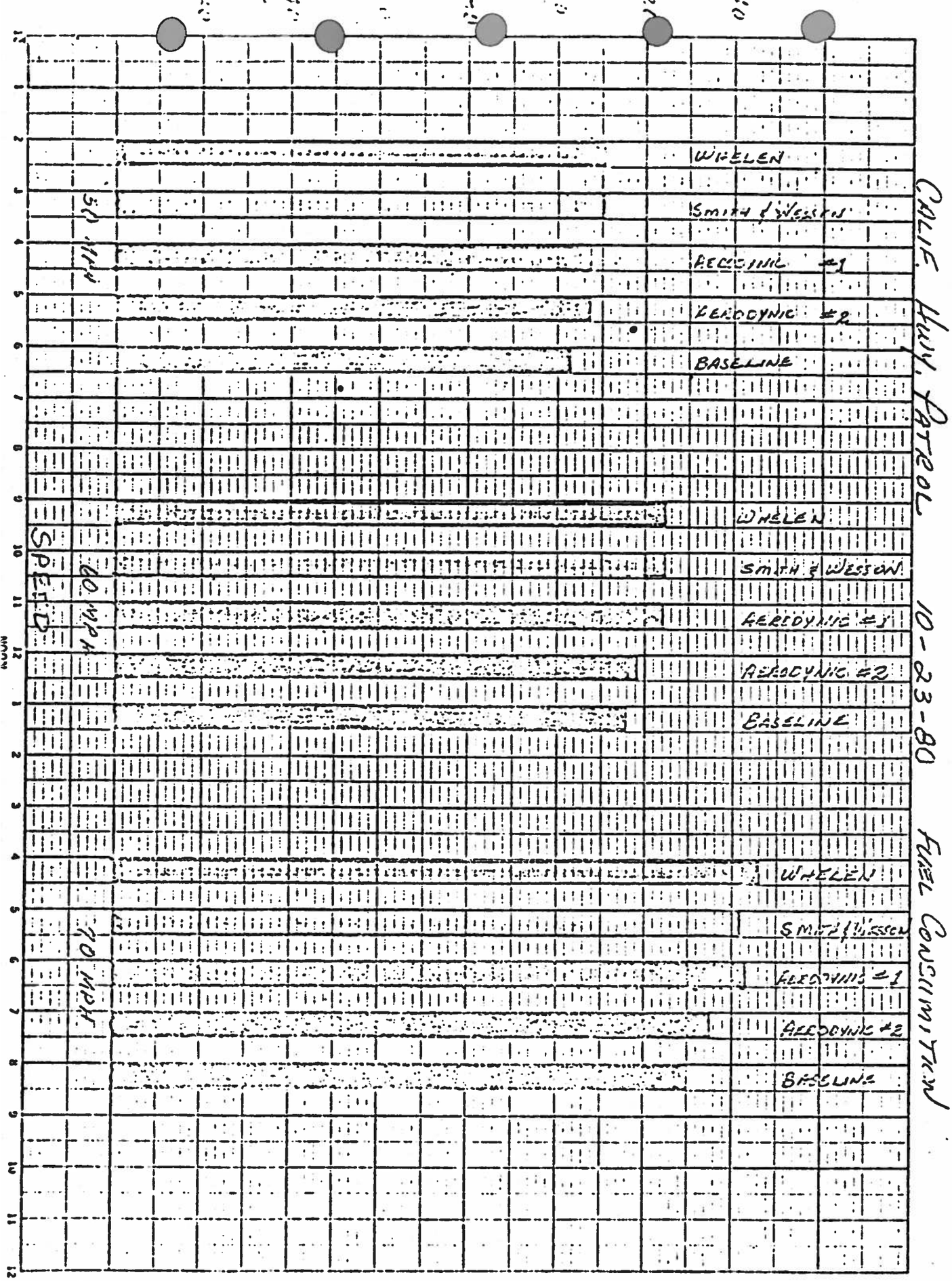
NOTE: This test was conducted for the purpose of measuring the effect of various "streamlined" light bars on the fuel consumption of the Dodge St. Regis patrol car. CHP makes no representations as to the accuracy of its measurements or the effectiveness of the individual light bars tested. This material is for internal CHP use and permission to reproduce any portion is denied.

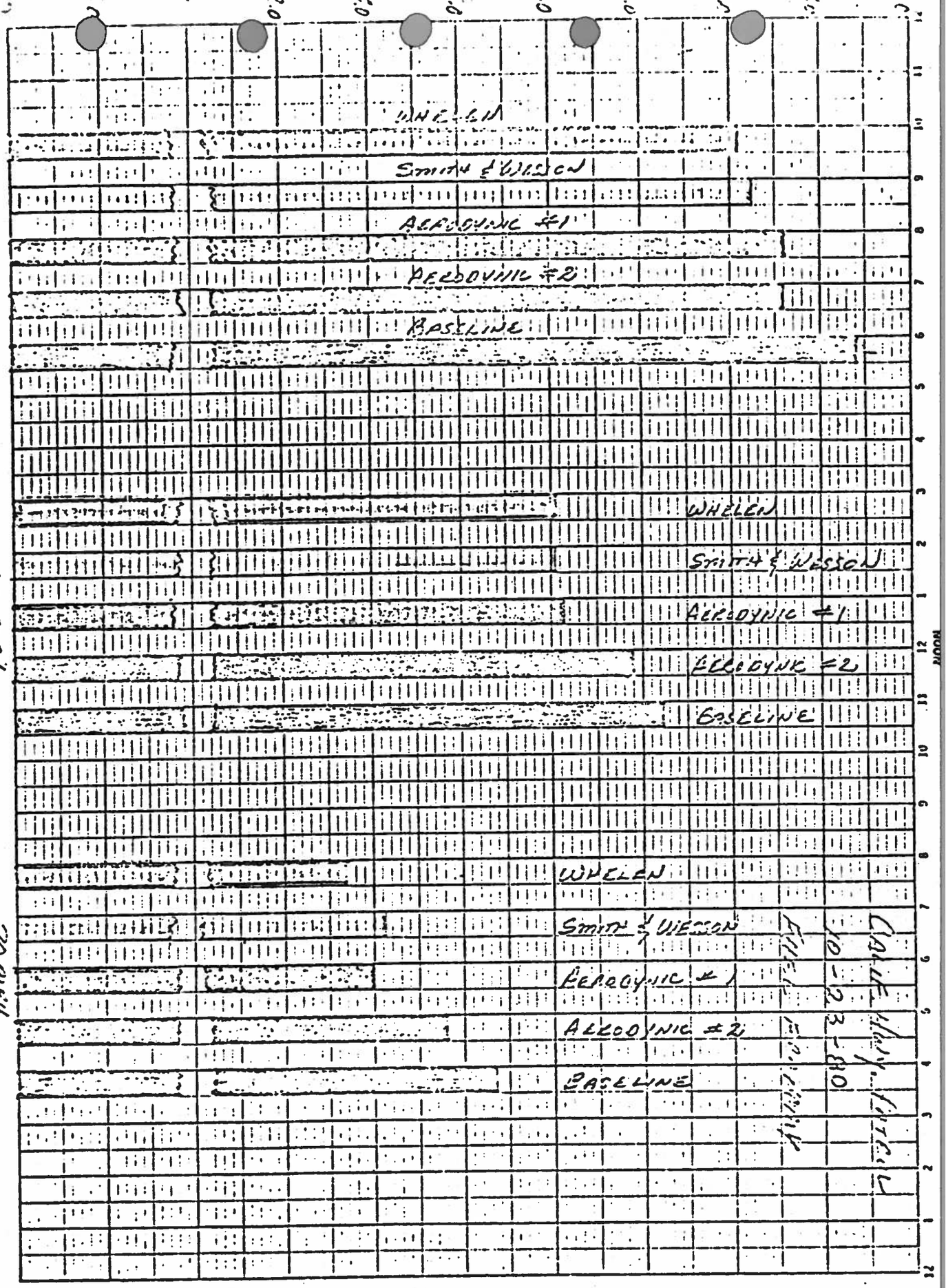
CALIFORNIA HIGHWAY PATROL

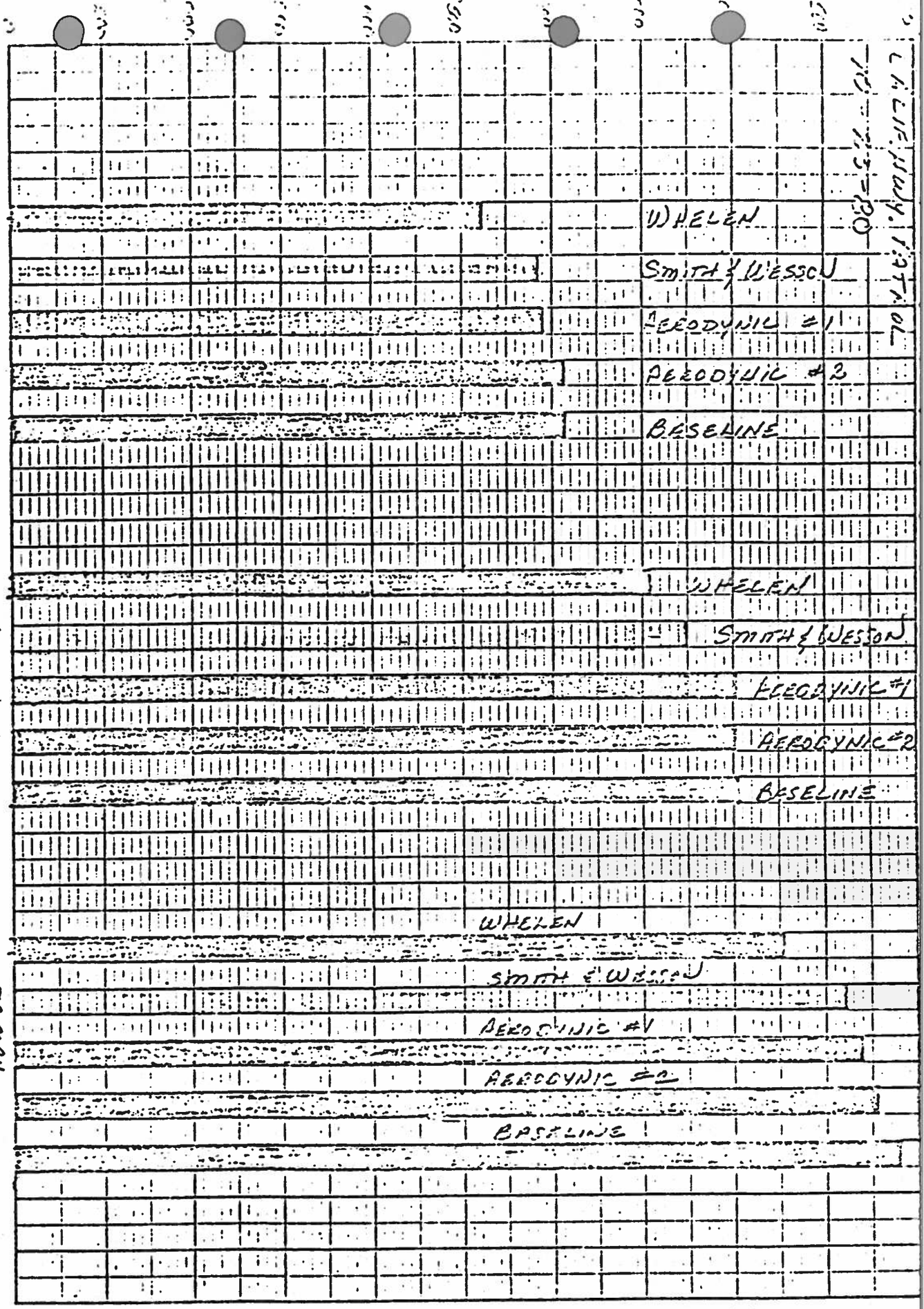
Fuel Consumption Tests

October 23, 1980

Test #		Speed & Direction	Elapsed Time	Fuel Gal/2 mi.	Elapsed Time	Distance Feet	Time
1	Baseline	60 S	2:01.1	.117	2:12.0	4010	0945
2	"	60 N	2:00.9	.118	2:18.6	4030	
3	Whelen	50 S	2:23.2	.109	54.2	2610	1015
4	"	50 N	2.55.5	.112	54.4	2640	
5	"	60 S	2:01.6	.125	1:06.0	3580	1030
6	"	60 N	2:01.3	.123	1:05.1	3490	
7	"	70 S	1:43.4	.147	1:15.9	4360	1040
8	"	70 N	1:43.2	.145	1:13.0	4210	
9	Smith & Wesson	50 S	2:22.7	.109	59.1	2890	1100
10	"	50 N	2:24.5	.110	1:00.2	2960	
11	"	60 S	2:00.2	.121	1:11.5	3780	1110
12	"	60 N	1:59.8	.128	1:08.8	3710	
13	"	70 S	1:43.7	.139	1:21.5	4710	1125
14	"	70 N	1:43.7	.144	1:16.1	4510	
15	Aerodynic #1	50 S	2:21.9	.108	1:00.4	2940	1145
16	"	50 N	2:24.9	.107	1:01.8	2970	
17	"	60 S	2:00.4	.123	1:13.8	4040	1200
18	"	60 N	1:59.8	.125	1:08.1	3980	
19	"	70 S	1:44.5	.140	1:21.0	4740	1215
20	"	70 N	1:43.2	.146	1:18.8	4650	
22	Aerodynic #2	50 S	2:22.8	.108	1:02.4	3050	1230
22	"	50 N	2:23.6	.107	1:04.8	3090	
23	"	60 S	2:01.0	.120	1:08.5	3950	1245
24	"	60 N	2:00.0	.117	1:13.0	4070	
25	"	70 S	1:43.6	.137	1:21.2	4710	1300
26	"	70 N	1:43.8	.133	1:21.8	4850	
27	Baseline	50 S	2:23.8	.102	1:02.0	3060	1315
28	"	50 N	2:23.6	.104	1:03.9	3090	
29	"	60 S	1:59.7	.118	1:15.1	4040	1325
30	"	60 N	2:00.1	.114	1:14.5	4020	
31	"	70 S	1:43.8	.132	1:24.3	4850	1340
32	"	70 N	1:44.0	.128	1:22.8	4960	







1941

DATE: 11 MARCH 1980

TIME: 11:30 AM

TYPE EVALUATION/TEST CONDUCTED:

OTHER: WITH AERO DYNICS OVERHEAD LIGHT BAR

WEATHER CONDITIONS (if applicable) CLEAR/MILD SLIGHT BREEZE

TEMPATURE (if applicable) 62°

VEHICLE USED (if applicable) 1979 CHEVROLET MALIBU VIN - 1T19L9Z469298

ACCELERATION:

0 - 60 mph 12.5 #of Seconds

0 - 90 mph 33.9 #of Seconds

0 - Top End 95 MPH. ~~#of Seconds~~

VEHICLE MILEAGE: 25,937.6

COMMENTS: OPEN ROAD - PATROL SPEED W/ OVERHEAD LIGHTS VEHICLE AVERAGED 14 MPG. VEHICLE OPERATED AT HIGH SPEEDS & HARD ACCELERATION AVERAGED 7 MPG. VEHICLE WITHOUT OVERHEAD LIGHT BAR GOT 46% BETTER MPG.

DATE: 11 MARCH 1980

TIME: 11:30 AM

TYPE EVALUATION/TEST CONDUCTED: FUEL CONSUMPTION - ACCELERATION RUNS WITHOUT AND WITH VARIOUS TYPES OF OVERHEAD LIGHTS

OTHER: WITHOUT OVERHEAD LIGHTS

WEATHER CONDITIONS (if applicable) CLEAR/MILD SLIGHT BREEZE

TEMPATURE (if applicable) 62°

VEHICLE USED (if applicable) 1979 CHEVROLET MALIBU VIN-1T19L9Z4G31

ACCELERATION:

0 - 60 mph (1) 11.6 (2) 11.5 #of Seconds

0 - 90 mph (1) 28.5 (2) 28.6 #of Seconds

0 - Top End 105 MPH #of Seconds 54 SEC.

VEHICLE MILEAGE: 11,794.6

COMMENTS: OPEN ROAD - PATROL SPEED WITHOUT OVERHEAD LIGHT BAR, VEHICLE AVERAGED 26 MPG. VEHICLE OPERATED AT HIGH SPEEDS & HARD ACCELERATION AVERAGED 10 MPH. NOTE: THIS VEHICLE WAS EQUIPED WITH OVERHEAD LIGHT BAR DURING PRETRIAL TESTING.

DATE: 11 MARCH 1980

TIME: 11:30 AM

TYPE EVALUATION/TEST CONDUCTED:

OTHER: WITH AERO DYNIC OVERHEAD LIGHT BAR

WEATHER CONDITIONS (if applicable) CLEAR/MILD SLIGHT BREEZE

TEMPATURE (if applicable) 62°

VEHICLE USED (if applicable) 1979 CHEVROLET MALIBU VIN-1T19L9Z469311

ACCELERATION:

0 - 60 mph 12.2 #of Seconds

0 - 90 mph 31.2 #of Seconds

0 - Top End 101 MPH #of Seconds 55 SEC.

VEHICLE MILEAGE: 11,797.6

COMMENTS: SEE TEST #1 FOR COMMENTS

DATE: 11 MARCH 1980

TIME: 11:30 AM

TYPE EVALUATION/TEST CONDUCTED:

OTHER: WITH TWIN SONIC OVERHEAD LIGHT BAR

WEATHER CONDITIONS (if applicable) CLEAR/MILD SLIGHT BREEZE

TEMPATURE (if applicable) 62°

VEHICLE USED (if applicable) 1979 CHEVROLET MALIBU VIN-1T19L9Z469311

ACCELERATION:

0 - 60 mph 12.2 #of Seconds

0 - 90 mph 34.5 #of Seconds

0 - Top End 95 MPH #of Seconds 57.5

VEHICLE MILEAGE: 11,800.6

COMMENTS: SEE TEST #1 F.L. COMMENTS

STATE OF NEVADA

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To Colonel Peter J. Zadra, Chief

From Lt. William Garteiz

Subject: EFFECTIVENESS OF OVERHEAD LIGHTING (360°) IN AVOIDING INTERSECTION (BROADSIDE) ACCIDENTS WITH AUTHORIZED EMERGENCY VEHICLES

This report is a compilation of information about the effectiveness of rotating overhead authorized emergency vehicle lights in operation and their effectiveness at intersections. Explaining further, this would be the type of accident where an authorized emergency vehicle is crossing an intersection and is struck broadside by another vehicle whose driver fails to see the emergency lights.

The question of how effective the rotating overhead emergency lights are in reducing these types of accidents.

For the past several years, the Nevada Highway Patrol has implemented various lighting systems which were mounted on top of the vehicle and were of a rotating and flashing type to be visible 360° or almost 360°. Because of the exceedingly high cost of gasoline, the Highway Patrol initiated a program to remove the overhead emergency rotating lights and realize a certain fuel savings. This saving is approximately 10 per cent. Implementation of rear flashing deck lights (red and amber) and flashing spotlights (red) ensued. Presently, the Highway Patrol has experimentally mounted high-intensity flashing lights (red and blue) to the front bumpers and deck lights mounted inside the rear window.

An investigation has been conducted and inquiries were made to other northern and southern emergency response Departments as to how many of these types of accidents have taken place, what types of lighting systems were being used when these accidents took place and a possible or probable cause for these accidents. That is, were these accidents caused by ineffective lighting systems or by driver's inattention. As a result of this investigation, there is no conclusive evidence that any of these accidents would have been avoided if overhead rotating emergency lights had been implemented. However, we find that several of these accidents involved emergency vehicles with overhead rotating lights. Furthermore, it is very likely that the possible or probable causes of these accidents would be driver inattention or speed too fast for conditions rather than the involved motorists not seeing emergency visual signals. By law (NRS 484.261) in the State of Nevada, an emergency vehicle must be displaying both audible and visual signals to be authorized.

Also, as per NRS 484.261, the driver of an authorized emergency vehicle may proceed past a red or stop signal or stop sign, but only after slowing down as may be necessary for safe operation.

Listed below are statistics relating to emergency vehicles, throughout Nevada, being involved in intersection accidents:

Carson City Sheriff's Office — Sgt. Rod Countryman — 882-3453

In 1½ years they have had two of these types of accidents. Both involved units were using overhead lights. Both were Twin Sonics, 1979.

Las Vegas Metropolitan Police — Sgt. Clark — (702) 386-3111

No statistics available, however, he cannot recall any accident of this nature in the last five years.

Reno Police Department — Sgt. Kemp/Officer Kenney — 785-2170

No statistics which show that type of information.

Sparks Police Department — Captain Wike — 356-2220

Since September 9, 1979, their Department has experienced six (6) emergency vehicle intersection accidents while conducting an authorized response. One accident involved a police motorcycle. Units were equipped with overhead (red and blue) rotating lights. Five (5) of these were red and blue bubble gum type, the other was a motorcycle.

Washoe County Sheriff's Office — Pete Bigrigg (Supervisor) — 785-4041

Only one of these types of accidents in last five years. Officer slowed for intersection and was struck by vehicle which failed to yield to emergency vehicle. Type of lighting system unknown.

Las Vegas Fire Department — 386-6361

Have experienced twelve (12) of these accidents since 1976. Units equipped with overhead rotating lights. Most of them are the round, "Red-Head Bubble Gum type".

Nevada Division of Forestry — Mike McCarty

Claims two (2) accidents of this type in last five (5) years. Type of lighting unknown.

Medic I — Reno - 323-2142 — Carson City - 883-1122

Two (2) such accidents in past three (3) years. 1) Nov., 1977 - Daylight accident (raining), 2) Nov., 1980 - Night accident and possible fault of paramedic.

Mercy Ambulance - Las Vegas Bob Forbes (702) 731-1404

In the past five (5) years, 90 percent of all their accidents occurred at intersections. (All units have side lighting). Two largest causes:

1) Improper caution by paramedic
2) Driver of other vehicle states they did not see other vehicle

1948

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

January 29, 19 81

To Captain Paul F. McGowan

Operations Commander, Southern Region

From Sergeant Richard Haas RH

Subject: STATISTICS REGARDING OVERHEAD/DECK LIGHTS

1. Started removing overhead red lights in July 1980.

2. We presently have 29 cars equipped with deck lights.
We presently have 33 cars equipped with overhead lights.

3. In 1980 Southern Region had 1 vehicle equipped with rear deck lights involved in an accident. (DUI rearended unit that was on a traffic stop)

*In 1980 Southern Region had 13 accidents involving patrol cars. (12 had overhead lights) - of that number 6 were functioning as emergency vehicles.
(1 rearend collision)
(1 vehicle was backed into)
(4 vehicles damaged during pursuits)

*In 1979 Southern Region had 24 accidents (all had overhead lights) of that number 14 were functioning as emergency vehicles.
(8 rearend collisions)
(4 backed into)
(2 pursuits)

*In 1978 Southern Region had 36 accidents (all had overhead lights) of that number 25 were functioning as emergency vehicles.
(8 rearend collisions)
(2 backed into)
(10 pursuits)
(5 damaged cross median or by debris)

RH:skb

DEPARTMENT OF MOTOR VEHICLES

MEMORANDUM

March 11, 19 81

To Capt. Eric J. Hatch, Commander

General Services Bureau

From Trooper Larry Davis

Subject: EMERGENCY LIGHT SYSTEM CANDLEPOWER

The candlepower of the Noren Red-Eye Bumper Mount/rear deck/spotlight system currently being tested is:

Front Bumper Mount Lights:	250,000	(Red)
	250,000	(Blue)
Spotlight (Mounted on driver's side of vehicle with light beam projected to the front of the vehicle).	330,000	(Red)
Total candlepower projected to the front of Patrol vehicle	830,000	candlepower
Rear Deck Lights:	330,000	(Red)
	330,000	(Blue)
Total candlepower projected to the rear of the Patrol unit	660,000	candlepower

Candlepower of the above lights was obtained from:

Mr. John Beddome
National Safety Products
5305 No. 7th St., Suite #1
Phoenix, Arizona
(602) 274-7900

The candlepower of the Federal Aerodynic Light System is:

4 (four) Halogen Rotating Lights with Red Dome cover to front and rear	60,000	candlepower
4 (four) Clear Seal Beam Lights Model 4414 with Red Dome cover to front of Patrol Unit	375	candlepower
4 (four) Clear Seal Beam Lights Model 4414 with Amber Dome cover to rear	1,020	candlepower

The Federal Aerodynic Lights are operated with a 3 (three) position switch allowing the following sequence of lights to be used at any one time.

Position #1 - 4 Amber lights (2 each side of light bar) alternately flashing to the rear of the Patrol vehicle.

Total candlepower 2,040 candlepower

Position #2 - 4 Amber lights (2 each side of light bar) alternately flashing to the rear of the Patrol Unit, and 4 Red lights steadily activated to the front of the Patrol vehicle.

Total candlepower:
To front of Patrol vehicle ------- 1,500 candlepower
To rear of Patrol vehicle ------- 2,040 candlepower

Position #3 - 4 Halogen rotating lights (2 facing forward - 2 facing rear) and 4 Red lights steadily activated to the front of the Patrol vehicle.

Total candlepower:
To front of Patrol vehicle ------- 121,500 candlepower
To rear of Patrol vehicle ------- 120,000 candlepower

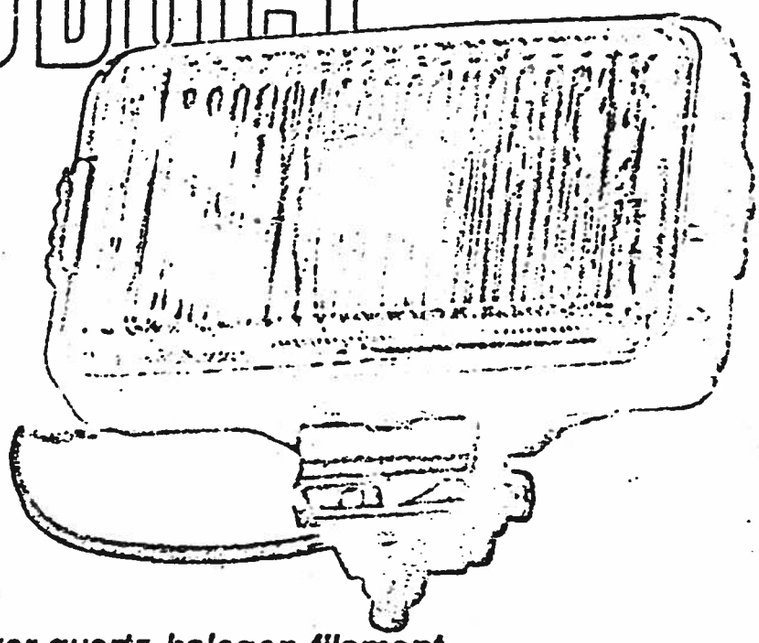
Candlepower of the above lights was obtained from:

Mr. John Gardner
Federal Signal Corp.
160 Saratoga Ave., Suite #36
Santa Clara, California
(408) 247-9694

LD:jdh

A JOHL COST $3.50 FOR SET IN SETS OF 6 EA.

NEW PRODUCT



THE NON-DISGUISED BUMPER RED-EYE®

Available in Red or Blue

★ *250,000 candle power quartz-halogen filament.*

- ★ *Reduced air drag allows higher speed, better gas mileage.*
- ★ *Mounted and prefocused, always ready at the flick of a switch.*
- ★ *Less than 1/3 the cost of a light bar.*
- ★ *One year unconditional guarantee.*
- ★ *High intensity, wide angle beam.*
- ★ *Fits any U.S. or foreign vehicle.*

This new light is ideal for marked pursuit vehicles, cruisers, and traffic units desiring a lower profile than a light bar affords. Due to greatly reduced air drag, higher speeds and better gas mileage are possible.

Go from low profile to code 3 at the flick of a switch.

Non-Disguised Bumper Red-Eyes are far superior to conventional grill lights and deck lights. They are easier to mount (5 minutes each), sturdier, brighter, and have a longer bulb life. Non-Disguised Bumper Red-Eyes are not plagued with the "tunnel vision" polarization of grill lights, either. Instead, they have a brilliant wide angle beam visible to drivers and pedestrians.

INTRODUCTORY OFFER PRICES

PAIRS WITH FLASHER KIT

COLOR	STOCK NO.	PRICE
RED	NDRF252	$127.50
BLUE	NDBF252	
RED & BLUE	NDRBF252	

SINGLE LIGHTS

COLOR	STOCK NO.	PRICE
RED	NDR-250	$40.00
BLUE	NDB-250	$40.00

NATIONAL SAFETY PRODUCTS
6305 N. 7th ST., SUITE 1
PHOENIX, AZ. 85014
(602) 274-7800

NOREN PRODUCTS, INC.
3543 HAVEN AVE., MENLO PARK, CA 94025

415-365-0632

1952

APPROVED FOR USE IN CALIFORNIA

DECA — BLUE

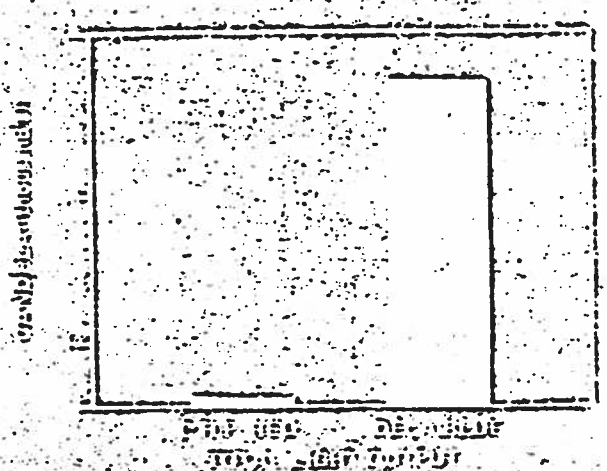
emergency light

DECA BLUE, approved for California emergency light application by a [illegible] DECA BLUE, developed by NOREN PRODUCTS, Inc., is [illegible] the brightest, most effective blue warning light [illegible].

DECA BLUE is a 100 watt PAR 46 sealed beam bulb designed [illegible] lights. DECA BLUE [illegible] "day time" visibility [illegible] by any blue [illegible] systems.

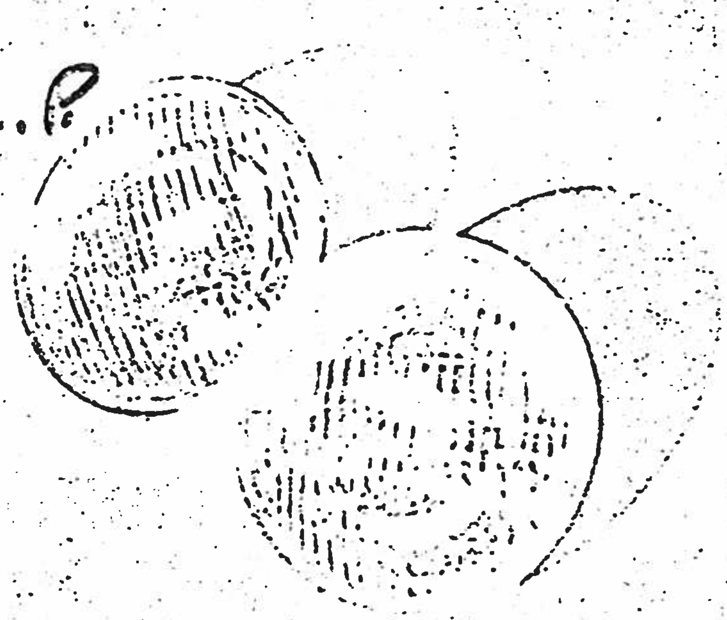
DECA BLUE is available as a single bulb, as a pair of bulbs, or as a complete two-bulb alternating flashing system.

For more information please contact Noren Products Inc.



This is for Bulbs only $2/50 EA.
RED, Blue, or Yellow

330,000 C.P.



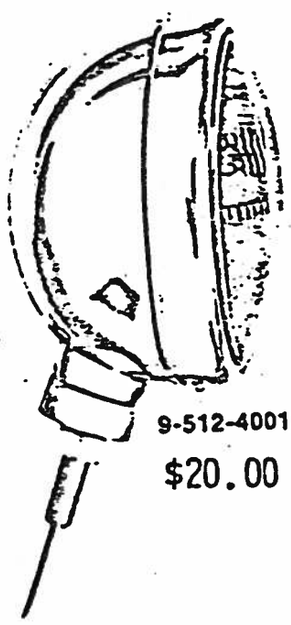
SAFETY DIVISON
(415) [illegible]

NOREN PRODUCTS, INC.
[illegible] HAVEN AVE, MENLO PARK CA [illegible]

9-512-4001R Red, 12 Volt, Chrome
9-512-4434A Amber, 12 Volt, Chrome
9-514-4434A Amber, 12 Volt, Grey Paint

Housing: Steel
Measurements: 5-7/8" diameter, 4-1/8" deep, 6-1/2" high.
Mounting: Hollow stud. 1/2" diameter. Ball socket for easy adjustment.

Can be used as steady burning or flashing emergency light.
Flasher must be ordered separately.



9-512-4001R
$20.00

CEPEC

CALIFORNIA ELECTRONIC POLICE EQUIPMENT COMPANY
1627 E. Edinger Avenue, Unit C Santa Ana, California 92705 (714) 543-9218

120

1954

MACCHI CORPORATION

MANUFACTURERS • ESTABLISHED 1939

819 VALENCIA STREET

SAN FRANCISCO, CALIF. 94110

INV. NO. 34288

ATT: CORPORAL FLEISCHMANN
NEVADA HIGHWAY PATROL
305 GALLETTI WAY
RENO, NEV 89512

DATE RECD. 2/25/81

INV. DATE 2-25-81 YOUR ORDER NO. PHONE

TERMS SHIP VIA UP

QUANTITY	UNIT	DESCRIPTION	~~List~~	AMOUNT
				Less than $200 Net
8		#12S-12v KAYOLAB FLASHER	$31.27 List	$15.15 $121.20
		UNITED PARCEL		1.72
		TOTAL		$122.92

R55071

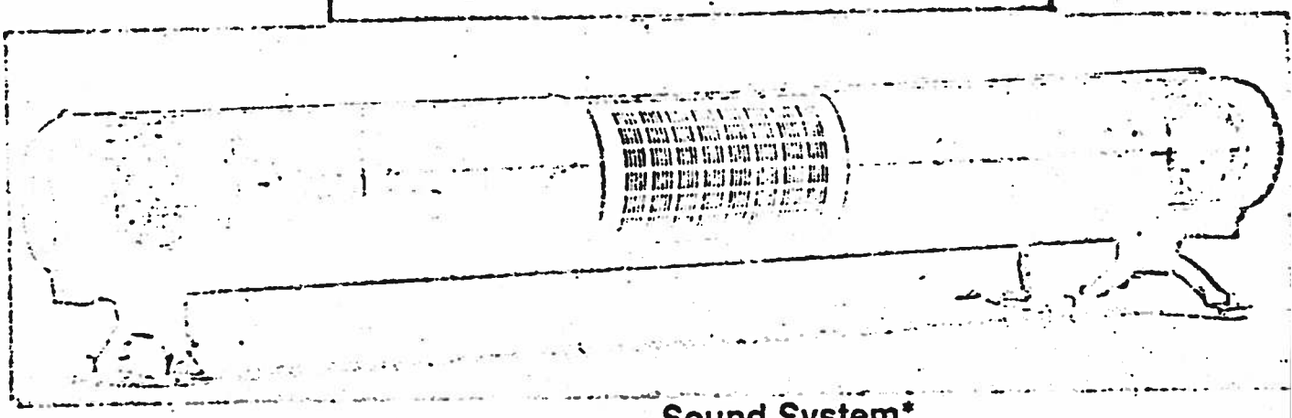
NO CLAIMS WILL BE RECOGNIZED
UNLESS MADE IN WRITING UPON RECEIPT OF GOODS

-41-

1955

AeroDynic

light/sound system



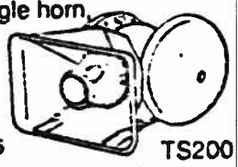
More Light! Brighter Light! Rapid, sustained, coherent light flashing across the length of the AeroDynic unit achieves new brilliance and intensity. End-lights indicate clearance on either side of the vehicle; increase depth perception so anyone on the road can get an accurate fix on your location whether you are moving or stationary. The result—a warning and identification signal far safer, brighter and more compelling than other systems.

Integral hi-power, single-speaker sound system. Delivers a concentrated sound pattern. Eliminates the "dead spots" caused by the two speaker cancellation effect. An added critical warning advantage that increases safety.

Saves fuel. Tests by USAC and Lockheed show that AeroDynic reduces drag, lets the vehicle move faster, and saves fuel—significantly. You can customize your vehicles with unprecedented color selectivity, sound and searchlight selections for optimum effectiveness on every type of vehicle you operate.

Sound System*.

Model TS200. Unique 200-watt light/sound system speaker. Dual drivers feed into a single horn, delivering "two-speaker volume"; eliminates the dead spots of two side-by-side speakers. For use with high-powered electronic siren amplifiers. **Order no. 00144600 $318.25**

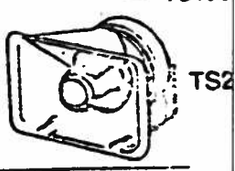


TS200

Model TS100. 100-watt speaker for use with high-powered siren amplifier. **Order no. 00144500 $167.50**

TS100

Model TS24. 58-watt speaker for use with compatible electronic sirens. **Order no. 00144300 $115.00**

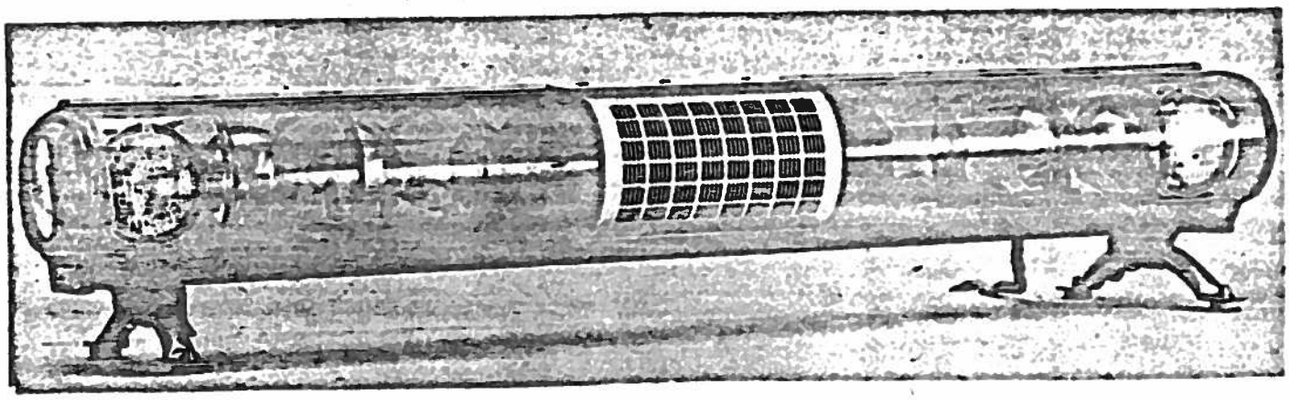


TS2

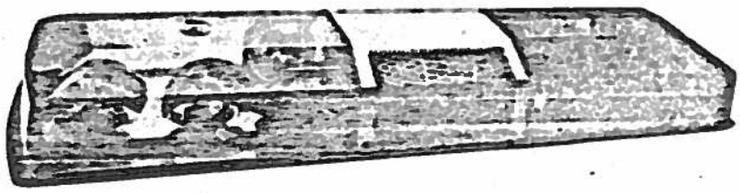
*NOTE: A siren amplifier is also required as a part of the sound system.

AeroDynic Light/Sound System (for Standard size cars)			
24	Incandescent Rotating Lights	Order No. 00136200	$488.75
24E*	Incandescent Rotating Lights/End Lamps	Order No. 00136700	$488.75
24A	Incandescent Rotating Lights/Alley Lamps	Order No. 00136300	$556.25
24EA*	Incandescent Rotating Lights/Alley and End Lamps	Order No. 00136800	$556.25
24H	Halogen Rotating Lights	Order No. 00137100	$517.00
24EH*	Halogen Rotating Lights/End Lamps	Order No. 00136900	$525.75
24AH	Halogen Rotating Lights/Alley Lamps	Order No. 00136400	$584.25
24EAH*	Halogen Rotating Lights/Alley and End Lamps	Order No. 00137000	$593.50
24C	California Version	Order No. 00136500	$534.25
24CA	California Version w/Alley Lamps	Order No. 00136600	$602.25
*	Take Down Option	Order No. Z11	$20.25
	You must order one of the following to mount all AeroDynic models		
24HK*	AeroDynic Hook-On Mount	Order No. 00137200	$59.50
24PK*	AeroDynic Permanent Mount	Order No. Z11X	$40.50
24SLK	Visibeam Mounting Kit for AeroDynic	Order No. 00137400	$17.00
	*Activating Switch is not included in mounting kit.		
SW8	Toggle Switch (SPST 40 Amp.)	Order No. 00149000	$7.75
SW9	Pull Switch (SPST — Pull, Pull)	Order No. 00149100	$14.50

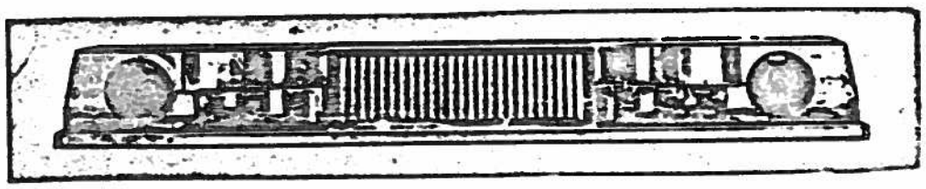
FEDERAL AERODYNIC

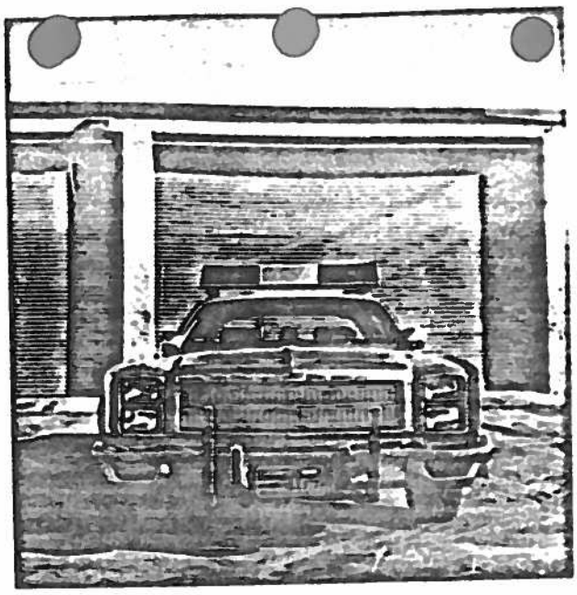


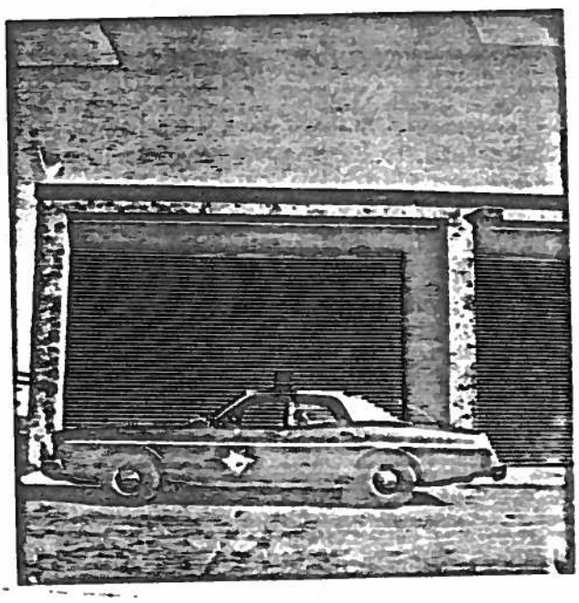
SMITH AND WESSON MODEL 8800



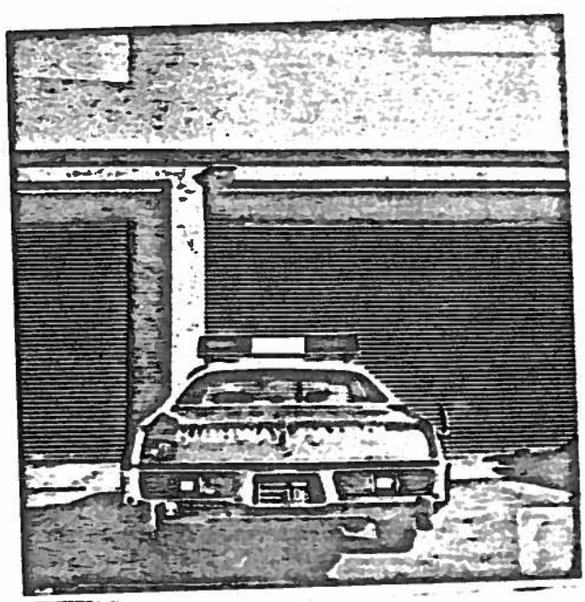
FEDERAL TWIN SONIC MODEL 12X

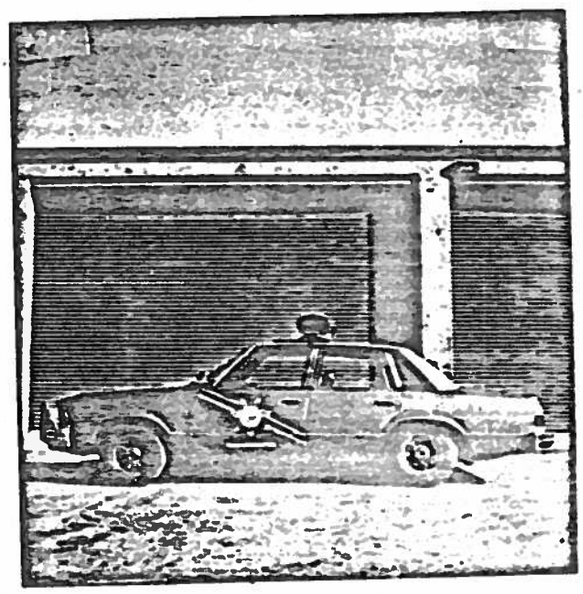




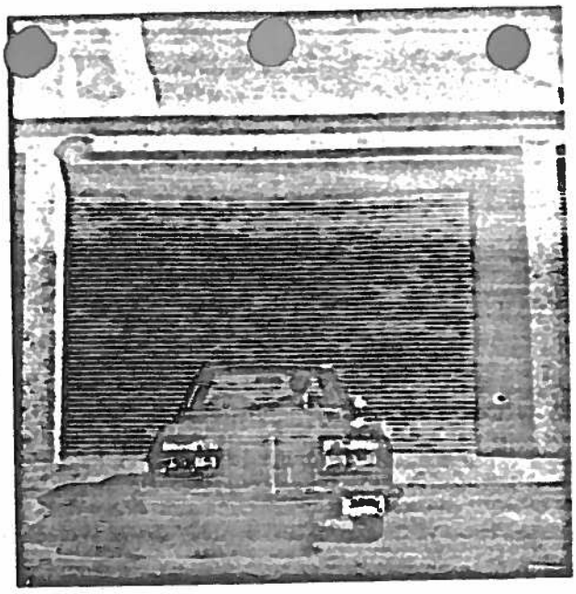


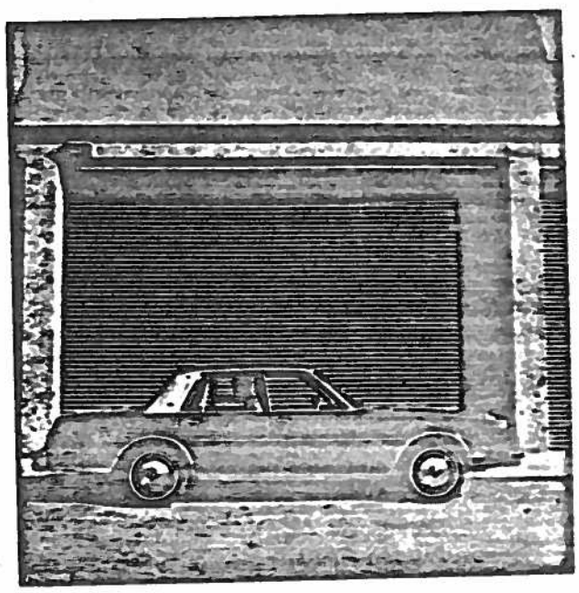
1978 Plymouth Fury
equipped with Federal
Twin Sonic Model 12X



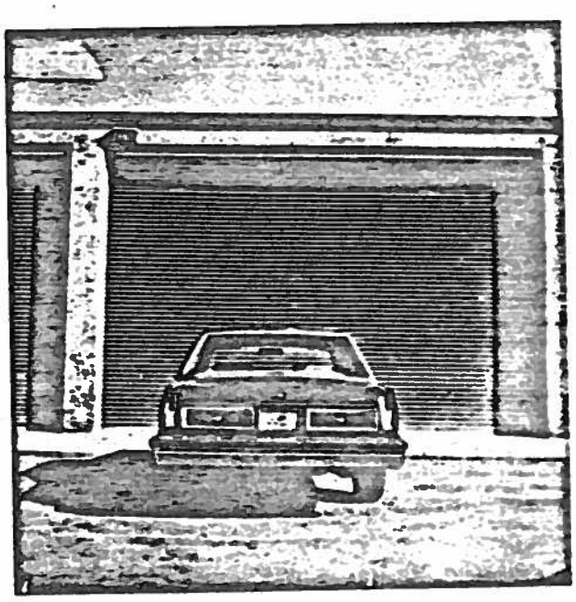


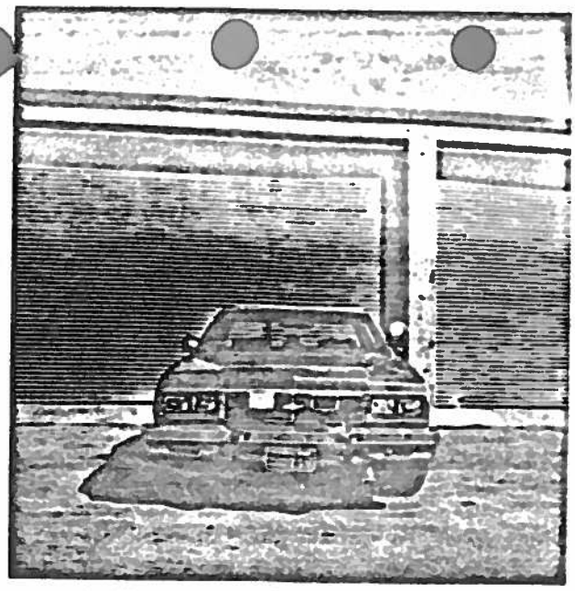
1979 Chevrolet Malibu equipped with Federal Aerodynic Model 24EH

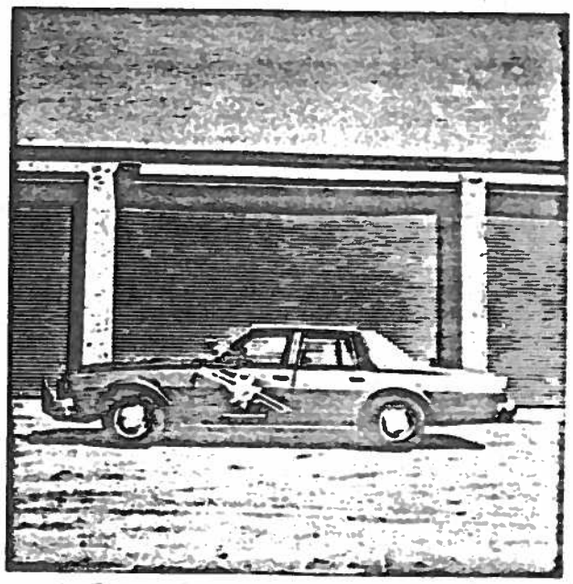




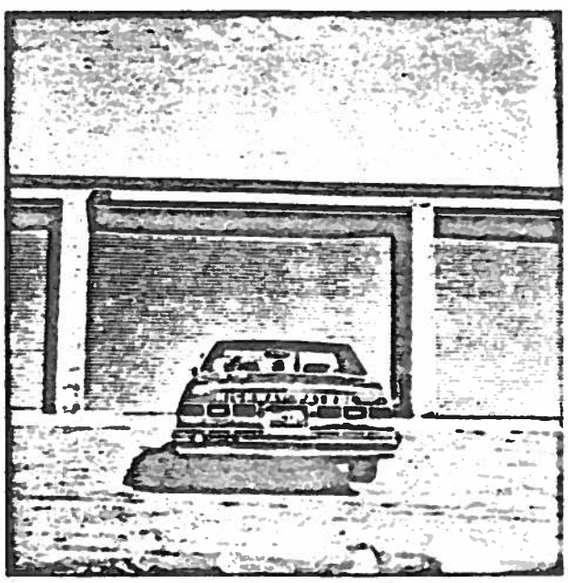
1981 Chrysler LeBaron

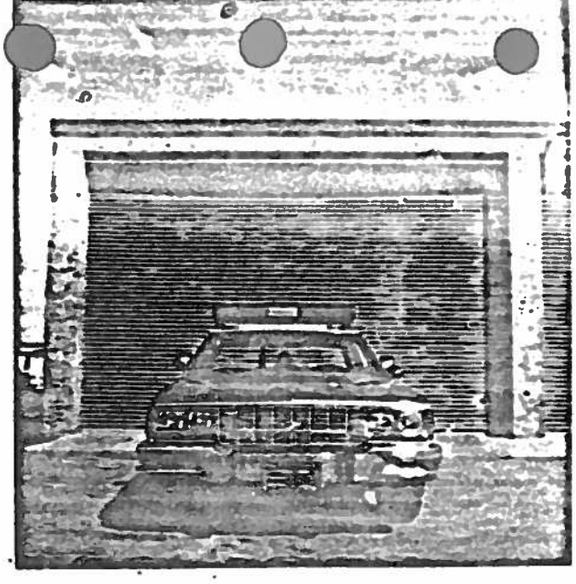


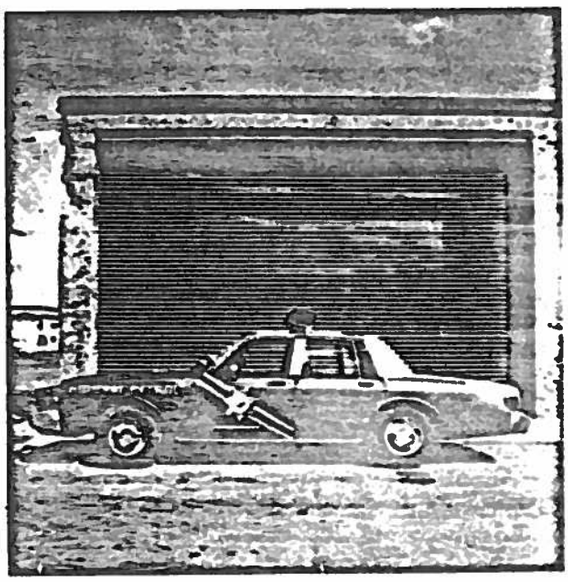




1979 Chevrolet Impala equipped with Noren Red-Eye Bumper Mount and Noren Tri-Bryt Seal Beam Lights







1980 Chevrolet Impala
equipped with Federal
Aerodynic Model 24EH