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DEPARTMENT OF TRANSPORTATION

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533 South Limestone
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May 11, 1976

MEMORANDUM TO: G. F. Kemper
State Highway Engineer
Chairman, Research Committee

SUBJECT: Research Report No. 446; "A Survey of Use of Left-Turn-on-Red;" KYP-75-70;
HPR-PL-1(11), Part III-B

When it was learned that a bill was prefiled before the 1976 General Assembly which would allow left-turn-on-red (LTOR) at intersecting, one-way streets, we initiated a survey of practices and experiences across the country and forwarded a summary to W. B. Drake and to the Division of Traffic on January 26. Respondents to our inquiries requested feedback from the survey also. We have, therefore, documented the information in a more usable way and for any future needs that may arise. The bill was defeated in the Senate Judiciary-Statutes Committee.

Respectfully submitted,

A handwritten signature in cursive script, reading "Jas. H. Havens".

Jas. H. Havens
Director of Research

JHH:gd

Enc.

cc's: Research Committee

Technical Report Documentation Page

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|---|--|--------------------------------------|----------------------------|--|-----------|
| 1. Report No. | | 2. Government Accession No. | | 3. Recipient's Catalog No. | |
| 4. Title and Subtitle A Survey of Use of Left-Turn-on-Red | | | | 5. Report Date May 1976 | |
| | | | | 6. Performing Organization Code | |
| | | | | 8. Performing Organization Report No. 446 | |
| 7. Author(s) Kenneth R. Agent | | | | 10. Work Unit No. (TRAIS) | |
| 9. Performing Organization Name and Address Division of Research Kentucky Bureau of Highways 533 South Limestone Street Lexington, Kentucky 40508 | | | | 11. Contract or Grant No. KYP-75-70 | |
| | | | | 13. Type of Report and Period Covered Interim | |
| 12. Sponsoring Agency Name and Address | | | | 14. Sponsoring Agency Code | |
| 15. Supplementary Notes Study Title: Development of Warrants for Separate Left-Turn Lanes and Signal Phasing | | | | | |
| 16. Abstract The objectives of this survey were to determine the extent that a left turn on a red traffic signal (LTOR) has been used across the country and to learn how effective it has been. Responses were received from 43 of the 55 cities surveyed. Of the cities responding, 22 have either had past experience with LTOR or have recently enacted an ordinance which will allow LTOR in the future. Most LTOR laws limit its use to intersections of two one-way streets. A much higher percentage of cities in the western United States have laws permitting LTOR than cities in the east. | | | | | |
| 17. Key Words Left-Turn-on-Red Traffic Law Left-Turn | | | 18. Distribution Statement | | |
| 19. Security Classif. (of this report) | | 20. Security Classif. (of this page) | | 21. No. of Pages | 22. Price |

Research Report
446

A SURVEY OF USE OF LEFT-TURN-ON-RED

KYP-75-70, HPR-PL-1(11), Part III-B

by

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The contents of this report reflect the views of the author who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Bureau of Highways. This report does not constitute a standard, specification, or regulation.

May 1976

INTRODUCTION

The use of right turns on a red traffic signal (RTOR) has gained popular acceptance in recent years. RTOR permits a right turn on a red traffic signal after stopping and yielding right of way to vehicles and pedestrians. A survey conducted in 1974 found that it was permitted in one form or another and in varying degrees in all but four of the 50 states. Kentucky has allowed RTOR, unless prohibited by signing, since 1974. For the same reasons that a right turn on red was permitted, some states permit left turns on red. Among the 1975 revisions to the **Uniform Vehicle Code** was a rule which allowed drivers to turn right on a steady red light unless a sign prohibits the turn. The revision (UVC Section 11-202(c)) also allowed turning left from a one-way street into a one-way street unless a sign bans the turn. The 1971 **Manual on Uniform Traffic Control Devices** provides (Section 4B-5) that when a sign is in place permitting a turn, traffic, except pedestrians, facing a steady circular red signal may cautiously enter the intersection to make the turn indicated by such sign. Using this section and context, either right or left turns could be permitted. The objectives of this survey were to determine the extent that left-turn-on-red (LTOR) has been used across the country and to learn how effective it has been.

PROCEDURE

A survey was taken of traffic engineers in 55 cities (representing 45 states and the District of Columbia). The survey was conducted in October and November of 1975. City, rather than state engineers, were surveyed since most applications of left-turn-on-red would be within cities. From the survey, the policies of the cities dealing with left turns on red were determined. For cities which allowed LTOR, comments concerning its effectiveness and guidelines for prohibiting or allowing the left turn were requested. Also, any comments or information, such as other jurisdictions which permitted LTOR, were invited.

SUMMARY OF FINDINGS

Responses were received from 43 cities (78 percent response). These cities represented 38 states. Information obtained from the survey are tabulated in APPENDIX A. Detailed summaries of the response of each city regarding their experience with LTOR along with any related comments were listed in the summary table. A synopsis of the major findings of the survey follows.

Of the 43 cities responding, 22 have either had past experience with LTOR or have recently enacted laws to permit LTOR. Another city allows vehicles facing a red signal to make the turn indicated by a sign, but it has only been utilized for RTOR.

Most LTOR laws limit its use to intersections of two one-way streets. However, five of the cities (in four states) allow LTOR from a two-way onto a one-way street. One city restricted LTOR to those areas where a one-way street crosses at the beginning of a one-way street and the ending of a two-way street. Copies of some of the LTOR laws are given in APPENDIX B.

Most ordinances allowing LTOR were enacted recently. Of 17 cities indicating the date of enactment, 11 became effective since 1972. In two cities, the ordinances have been in effect for approximately 20 years. In 19 of the 22 cities with LTOR, the rule is to allow the movement unless prohibited by signing. The other three cities allow LTOR only by signing.

There was a definite difference in LTOR legislation between cities in the western and eastern parts of the United States. Of 22 cities west of the Mississippi River, 15 (68 percent) allowed LTOR while only 7 of 21 cities (33 percent) east of the Mississippi River allowed LTOR. This is similar to the early development of RTOR which was once used almost exclusively in western states.

Nineteen cities had experience with LTOR. Only one recommended that LTOR not be used in Kentucky. The reason was that only a few intersections would be involved, and the danger and confusion would outweigh the benefits. A few cities stated that LTOR was not utilized by drivers. However, nearly all respondents indicated that the law had worked well, and there had not been significant problems.



Some cities listed guidelines used when prohibiting LTOR. Following is a list of various situations when prohibiting LTOR should be considered:

- a. heavy pedestrian movements, particularly in school zones;
- b. inadequate sight distance;
- c. high traffic volume or approach speeds on street to be entered;
- d. multi-leg intersections;
- e. very short red interval for potential turn;
- f. separate turning lane does not exist;
- g. dual turn lanes exist; and(or)
- h. restrictive geometrics.

These guidelines apply to RTOR as well.

Twenty-one cities indicated they did not use LTOR, and most cited an opinion about its use. Their opinions were tabulated into the following categories:

| Comment | Number of Responses |
|----------------------------|------------------------|
| Has considered LTOR | 6 |
| Would consider it feasible | 5 |
| Would not consider its use | 5 |
| No opinion stated | 5 |

Most LTOR laws were state laws, although some were city ordinances. Therefore, LTOR policy varies from city to city in some states.

Some respondents listed other cities which permit LTOR, but all cities mentioned were included in this survey.



APPENDIX A
SUMMARY OF SURVEY ON USE OF LEFT-TURN-ON-RED LAWS

| CITY | EXPERIENCE | COMMENTS |
|----------------------------|--|---|
| Albuquerque, New Mexico | City ordinance permits left turns on red at intersections of two one-way streets when a sign is posted. Signs have not yet been posted to allow left turns on red. | Plans are to use this control at some intersections which are presently under construction. |
| Anchorage, Alaska | Municipality has two conditions under which left turns on circular red are permitted: 1. left turn from a two-way to a one-way street and 2. left turn from a one-way to a one-way street. | Lack of public knowledge has limited its use and effectiveness. |
| Atlanta, Georgia | Present Georgia laws do not permit left turns on red. During the 1930's and 1940's, left turns on red were allowed at one-way street intersections (discontinued in 1949). | Feasibility of legislation which would permit such turns is being investigated. Opinion is that left turn on red would work well where two one-way streets are intersecting. |
| Baltimore, Maryland | No experience with left turns on red. | |
| Birmingham, Alabama | City ordinance (passed in December 1973) permitting left turns on red at intersections of two one-way streets unless signed otherwise. | Pleased with its effectiveness as related to both capacity and accidents. |
| Charleston, South Carolina | Does not presently have any locations where a left turn on red after stop is permitted. | State law allows traffic facing a red signal to cautiously enter the intersection and make the turn indicated by a sign. Law has only been utilized for right turns on red. |
| Charleston, West Virginia | City allows left turn on red from a one-way street onto another one-way street if it runs from right to left. | Law has been in effect for 6 months with no appreciable problems. |
| Cincinnati, Ohio | Not used at any kind of intersection. | Usage has been briefly discussed at a Council meeting, but no action has been taken. Issue may surface again after RTOR is generally accepted and well executed. |
| Cleveland, Ohio | State of Ohio does not permit left turns on red. | Legislative Committee of the Ohio Section of the Institute of Traffic Engineers has discussed such a measure during 1975. Cleveland, because of the geometry of its street pattern, would have extremely few locations where such a turn could be permitted. |
| Dallas, Texas | In March 1973, the State of Texas passed a law permitting left turn on red (after standing) at the intersection of two one-way streets. | Law has been accepted quite well in Dallas. |
| Denver, Colorado | City of Denver has permitted left turns on red from one-way streets since 1972. | No problems have been experienced with the law and have not had to install signs prohibiting the maneuver. |
| Des Moines, Iowa | Effective July 1, 1975, within the State of Iowa, left turns on red are allowed at the intersection of one-way streets unless signs prohibit such a turn. Have not prohibited this movement at any of the approximately 20 intersections within the central business district where such a turn would be legal. | Observations indicate that most motorists are very hesitant to take advantage of the turn, consequently they make the move only after they are sure of being able to make the move safely. |
| Detroit, Michigan | A state bill, effective April 1, 1976, allows left turns (unless prohibited by signing) into a one-way street after stopping at a red light, provided the driver enters the flow of one-way traffic from the left-hand turn lane of the side street. Detroit presently has four locations where the movement is allowed. | Accident data at the four intersections did not indicate any accidents resulting from this maneuver. |
| Houston, Texas | In August 1973, a state law went into effect which allows a left turn on red if the intersecting streets are both one-way. | CBD is composed primarily of one-way streets and there has been no significant problem with left turn on red. |
| Honolulu, Hawaii | Left turn on red is permitted where two one-way streets intersect. LTOR has been allowed for over 20 years. | No detrimental effects have been experienced from this movement. |
| Idaho Falls, Idaho | Left turns on red are not allowed under any conditions. | |
| Jackson, Mississippi | Left turns on red are not allowed at the present time. | Some consideration may be given in the future to enacting a law to permit such a movement. |
| Kansas City, Missouri | City Traffic Code permits left turns on red (after stopping) at the intersection of two one-way streets unless prohibited by signing. This has been in effect for 18 months. | No difficulties have been experienced. Accident studies have indicated very few accidents occur involving the left turn on red movement. |
| Lansing, Michigan | Michigan State Legislature passed a law (effective April 1, 1976) allowing left turn on red from a one-way or two-way street to a one-way street. As yet, there is no experience with this law. | |
| Lincoln, Nebraska | City ordinance permits left turns on red. Four locations are signed "Left Turn on Red After Stop". Restricted to those areas where a one-way street crosses at the beginning of a one-way street and the ending of a two-way street. | By restricting the left turn on red to those areas where a one-way street is beginning and a two-way street is ending, the approaching traffic is in such a position as to allow the driver to see oncoming vehicles through the front windshield of the car. Otherwise, an occupant on the passenger side in the front seat or the bar separating the front window and the door jam may obstruct his view. |

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| Little Rock, Arkansas | No experience with left turn on red. | |
| Madison, Wisconsin | State of Wisconsin has allowed left turn on red since July 1, 1975, from a one-way street onto a one-way street unless prohibited by signing. | Left turn movement has not been a particular problem. Some problems encountered include vehicles failing to come to a full stop before turning, a substantial number of complaints from citizens (90 percent of these from pedestrians), and vehicles blocking the crosswalk while trying to get a better view of oncoming traffic. |
| Memphis, Tennessee | No locations where left-turn movement is permitted. | Do not contemplate using that type of control and would strongly discourage such use. |
| Minneapolis, Minnesota | Minnesota legislature passed a law permitting left turns on red unless specifically prohibited at intersecting one-way streets. Law became effective January 1, 1976, and there has been no previous experience with it. | Does not favor left turn on red or right turn on red because neither city nor state enforce the "Yield to Pedestrian in Crosswalk" laws or violations of the intent of the right-turn-on-red law. |
| Newark, New Jersey | Do not allow left turns on red under any conditions. | Idea of allowing left turns on red at some intersections of two one-way streets is a feasible one, provided proper signs are posted at the intersections involved. |
| New Haven, Connecticut | Does not permit left turns on red at any location. | Not contemplating use of this maneuver. |
| New Orleans, Louisiana | Not allowed under any condition. | Such turns would be feasible from a one-way street onto another one-way street. |
| New York, New York | Very few locations, less than five, exist where left turns on red are authorized by appropriate signing. | This type control is effective where pedestrian and vehicular conflicts, with the permitted movement, will be minimal. There should be sufficient turning volumes to warrant the installation. Do not favor laws authorizing general usage of this control. It should only be used where engineering studies indicate the need. |
| Norfolk, Virginia | Do not allow left turns on a red signal under any conditions. | In the interests of conservation of energy, there is a possibility that a workable solution can be derived for allowing a left turn on red at the intersection of two one-way streets. |
| North Las Vegas, Nevada | No experience with left turns on red. | Used in conjunction with one-way streets, it would appear to serve the same purpose as the conventional right turn on red. |
| Orlando, Florida | Six-year experience with the left turn on red at intersecting one-way streets has been good. No recorded data where the turning driver was the cause of an accident. | Would recommend left turns on red where an intersection can effectively handle the situation and prohibition signing at other locations not suitable. |
| Philadelphia, Pennsylvania | No experience with left turns on red. | Not venturing into left turns on red in the foreseeable future. In the past 2 or 3 years, no new right turns on red have been established while a dozen or more have been discontinued as a result of public pressure (usually pedestrian activity). |
| Phoenix, Arizona | Left turns on red are allowed by state law from a one-way street to a one-way street; this applies to 14 intersections within the city of Phoenix. General public does not understand this and estimated observance and usage is less than 10 percent of those who could make the turn. Have observed motorists turning left on red from a one-way to a two-way street and end up traveling on the wrong side of the two-way street. | Would recommend left turn on red not be included in Kentucky laws because of the few intersections where this would apply. Danger and confusion outweighs the efficiency gained. |
| Portland, Oregon | Left turn on red at one-way streets has been allowed for at least 20 years. Experience has been completely satisfactory. Should be prohibited by signing under certain circumstances. | Does not feel the left turn on red from a two-way into a one-way street is significant enough to include in the vehicle laws. |
| Providence, Rhode Island | City and state do not allow left turn on red or right turn on red. | Have opposed a bill which would allow RTOR. It is felt that use of LTOR might further confuse many motorists. |
| Raleigh, North Carolina | Left turn on red is not allowed. | Idea for such a permissive move was suggested in the legislature of some 2 years ago, but no action was taken. Have not experienced any consequential problems related to right turn on red and the feeling is that left turn on red would not create problems. |
| Salt Lake City, Utah (Utah DOT) | Left turn on red is not permitted. | |
| San Diego, California | Left turns on red are permitted at the intersections of two one-way streets by the California Vehicle Code. | Experienced no problems with the left on red movement, and this movement has not been prohibited at any intersections. |
| San Francisco, California | Left turn on a circular red at intersecting one-way streets are allowed unless prohibited by signing. | Has served well as a means of efficiently moving traffic and no traffic-related problems have been associated with the law. |
| Seattle, Washington | For many years, state and city traffic laws have allowed left turns on red from a one-way or two-way street into a one-way street carrying traffic in the direction of the left turn unless prohibited by signing. Have had no adverse experience. | Left-turn-on-red feature is one which is not commonly known or exercised by drivers either in the city or the state. |

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| Sioux Falls, South Dakota | Law does not address itself to permitting left turns on a red signal; therefore, no experience available in this area. | Each location would have to be analyzed individually. In the case of a one-way street intersecting with a two-way, a left turn on red would create two collision points as opposed to one collision point with the right turn on red. |
| St. Louis, Missouri | City does not permit left turn on red. | No consideration has been given to such an unorthodox movement. It is generally felt that pedestrians already encounter sufficient difficulty with the right turn on red without adding to that difficulty by permitting a left-turn movement. |
| Topeka, Kansas | City and state do not have legislation allowing left turn on red. | Bill was introduced in 1975 Kansas Legislature but was held over for further study and to obtain information on the 1974 law allowing RTOR. Traffic engineers in Kansas are in favor of the LTOR at the intersection of two one-way streets, and many supported such legislation during the 1975 Kansas session. |



APPENDIX B
LEFT-TURN-ON-RED LAWS

**Denver, Colorado
(City Ordinance)**

.6-3. Steady Red Indication.

.6-3(1) (a). Vehicular traffic facing a steady circular red signal alone shall stop at a clearly marked stop line but, if none, before entering the crosswalk on the near side of the intersection or, if none, then before entering the intersection and shall remain standing until an indication to proceed is shown, except that: .6-3(1) (c). Such vehicular traffic when proceeding on a one-way street and after coming to a stop, may make a left turn onto a one-way street upon which traffic is moving to the left of the driver. Such turn shall be made only after yielding the right of way to pedestrians and other traffic proceeding as directed. No such turn shall be made if a sign is erected giving notice of any such prohibition at each and every intersection where such left turn is prohibited.

**State of California
(California Vehicle Code Section 21453)**

(c) The driver of a vehicle on a one-way street which intersects another one-way street on which traffic moves to the left shall stop in obedience to a red or "stop" signal but may then make a left turn into said one-way street, but shall yield the right-of-way to pedestrians and other traffic proceeding as directed by the signal at said intersection, except that local authorities may by ordinance prohibit any such left turn as above described, which ordinance shall be effective when a sign is erected at such intersection giving notice thereof.

**State of Michigan
(Enrolled House Bill No. 4057)**

(c) Steady red indication

(1) Vehicular traffic facing a steady red signal alone shall stop before entering the crosswalk on the near side of the intersection or at a limit line when marked or, if none, then before entering the intersection, and shall remain standing until a green indication is shown, except as provided in subsection (c) (2).

(2) Vehicular traffic facing a steady red signal, after stopping before entering the crosswalk on the near side of the intersection or at a limit line when marked or, if none, then before entering the intersection, shall be privileged to make a right turn from a one-way or two-way street into a two-way street or into a one-way street carrying traffic in the direction of the right turn: or a left turn from a one-way or two-way street into a one-way street carrying traffic in the direction of the left turn unless prohibited by sign, signal, marking, light or other traffic control device. The vehicular traffic shall yield the right of way to pedestrians lawfully within an adjacent crosswalk and to other traffic lawfully using the intersection.

**State of Washington
(Revised Code of Washington 46.61.055)**

(3) Steady red indication

(a) Vehicular traffic facing a steady red signal alone shall stop before entering the crosswalk on the near side of the intersection or, if none, then before entering the intersection and shall remain standing until a green indication is shown: Provided, that such traffic may, after stopping cautiously proceed to make a right turn from a one-way or two-way street into a two-way street or into a one-way street carrying traffic in the direction of the right turn; or a left turn from a one-way or two-way street into a one-way street carrying traffic in the direction of the left turn; unless a sign posted by competent authority prohibits such movement; but vehicular traffic making such turns shall yield the right of way to other vehicles and to pedestrians lawfully within the intersection or an adjacent crosswalk at the time such signal is exhibited.

