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16. Abstract <p>This report documents a nationwide survey conducted to evaluate various states' work zone traffic safety programs established in response to FHPM 6-4-2-12. The survey was sponsored by the Texas State Department of Highways and Public Transportation in an effort to optimize their own work zone traffic safety program.</p> <p>Input from 44 states was reviewed during the survey, including formal written policy statements, procedural recommendations, TCPs and traffic control guidelines, flow charts, checklists, and descriptions of informal policies and normal procedures. Based on this information, innovative policies and practices were identified and are described herein. Also presented in this report are suggested improvements to Texas' work zone traffic safety program based on the survey findings.</p>					
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A REVIEW OF WORK ZONE SAFETY PROGRAMS  
IN SELECTED STATES

by

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Research Report 263-5

Traffic Management During Freeway Reconstruction  
and in Rural Work Zones  
Research Study 2-18-79-263

Sponsored by

State Department of Highways and Public Transportation

In Cooperation with the

U.S. Department of Transportation  
Federal Highway Administration

Texas Transportation Institute  
The Texas A & M University System  
College Station, Texas

August 1981

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Input for the survey was provided by 44 states. The transportation/highway departments of these States are acknowledged for their cooperation and assistance:

Alabama	Kentucky	North Carolina
Alaska	Louisiana	North Dakota
Arizona	Maine	Ohio
Arkansas	Massachusetts	Oklahoma
California	Michigan	Oregon
Colorado	Minnesota	Pennsylvania
Connecticut	Mississippi	South Carolina
Delaware	Missouri	South Dakota
Florida	Montana	Texas
Georgia	Nebraska	Utah
Hawaii	Nevada	Vermont
Idaho	New Hampshire	Virginia
Illinois	New Jersey	West Virginia
Indiana	New Mexico	Wisconsin
Iowa	New York	

The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

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## INTRODUCTION

In recent years, there has been increasing national concern over work zone traffic safety. Several research studies (1, 2) have addressed this issue and found the concern to be justified. To illustrate the magnitude of the problem, there were almost 8,000 work zone accidents on state-maintained highways in Texas during 1977 (3). One-fourth of those accidents (over 2,000 accidents) occurred at 10 work zones. Other states have reported similar work zone accident problems. Another research study (4) associated the work zone accident problem with the lack of effective traffic control devices and/or procedures. These studies have concluded that many work zone accidents could be prevented if safer and more effective devices and procedures were implemented.

In response to the increasing number of work zone traffic accidents, the Federal Highway Administration established new policies for traffic control and safety on Federal-aid highway construction projects. These policies, in 1978, were incorporated into the Federal Highways Program Manual (FHPM 6-4-2-12) as shown in Appendix A. In particular, FHPM 6-4-2-12 establishes the following policy guidelines:

1. A Traffic Control Plan (TCP) must be prepared for all projects. A TCP is a plan for handling traffic through a work zone and may range in scope depending on the complexity of a project and resulting traffic interference.
2. A Responsible Person must be appointed by the highway agency to oversee traffic control on a specific project. This person must be properly trained in work zone safety and have full authority to implement the TCP.

3. Unit pay items should be established in the Plans, Specifications and Estimates for installing and maintaining work zone traffic control devices.
4. All persons responsible for the development, design, implementation, and inspection of traffic control at work zones must be adequately trained.
5. The safety of work zones in each state must be formally reviewed on an annual basis. Accidents occurring at each work zone must be monitored and continuously reviewed so that safety problems can be identified and corrected.

#### Survey Description

The survey was sponsored by the Texas State Department of Highways and Public Transportation (TSDHPT) in order to determine how Texas' work zone traffic safety program compares to programs in other states. The work zone safety programs in Texas and several other states were reviewed and innovative approaches were identified.

To gather input for the study, a letter requesting pertinent information was sent to the appropriate highway agencies in all 50 states. The letters were mailed in January 1980. A total of 44 states responded to the request. The information provided by the states included formal written policy statements, procedural recommendations, traffic control plans and guidelines, flowcharts, checklists, descriptions of informal policies, normal procedures, etc.



## SURVEY RESULTS

The survey revealed that, as of January 1980, 84% of the 44 states surveyed had prepared a formal written policy statement in response to FHPM 6-4-2-12. However, only about one-half of these policy statements address all five areas of concern in the Federal directive. Most of the policy statements reviewed were similar in content and wording to the Federal directive.

### Traffic Control Plans

All 44 highway agencies surveyed currently require a Traffic Control Plan (TCP) for every Federal-aid highway construction project. Several of the agencies also require a TCP for all major construction projects, and a few have promoted TCPs for maintenance projects.

At least 7 states have developed formal checklists and/or flowcharts for preparing TCPs. Such checklists and flowcharts help to assure an orderly consideration of all critical traffic safety factors in the TCP development and review processes. Care should be exercised in using these tools, however, since their improper use may encourage "cookbook" designs which overlook more practical or effective alternatives.

At least one state has established a system for categorizing work zone projects by project type, project duration, complexity, size and traffic interferences. This state has defined different TCP requirements for the various categories.

### Responsible Person

Approximately one-half of the state agencies surveyed assign the traffic control responsibility at a particular work zone to the Project Engineer.

About one-fourth assign the responsibility to the Resident Engineer. The remaining agencies surveyed, again about one-fourth, normally give the responsibility for traffic control on a project to a subprofessional (e.g., a Project Inspector).

One state currently requires the Responsible Person at a work zone to be certified. The qualifications for certification in this state are as follows:

1. At least one year of satisfactory experience directly related to worksite traffic control in a supervisory or responsible capacity.
2. Satisfactory completion of a three day training course in work zone traffic control.
3. Achieving a passing grade on a written examination.
4. Approval by the Certification Board.

#### Pay Items

There was considerable variation among the states in the way they handle pay items associated with work zone traffic control. Only about 20% of the states use unit pay items exclusively as recommended in FHPM 6-4-2-12. Fifteen of the responding states require unit pay items only on special traffic control devices (e.g., barriers, illumination, etc.), and permit lump sum bidding on the remainder of the work zone traffic control. Lump sum bidding is particularly common on small projects.

One state agency surveyed reported that it still allows traffic control at all work zones to be bid as an incidental item. This practice may result in traffic control being ignored at some work zones and is therefore not recommended.

## Training

All the state highway agencies surveyed have initiated statewide programs to train their employees in the fundamentals of work zone traffic control and safety. Approximately one-half of the state agencies are sponsoring pre-existing courses for this purpose (e.g., the National Highway Institute or Institute of Transportation Engineers courses on work zone safety). Several states have developed and administer their own training courses. Two state agencies reported that they engaged a consultant to develop and administer training courses for their employees.

In addition, four of the responding state agencies reported that they sponsor several different training courses aimed at different levels of employees (e.g., supervisors, foremen, work crew, etc.). Seven of the responding states are attempting to train city, county, and/or contractor employees in addition to their own personnel.

## Statewide Reviews

FHPM 6-4-2-12 requires each state to conduct annual reviews of safety and traffic control at randomly selected work zones. From the survey findings, some states designate a multi-disciplinary group to conduct these reviews (e.g., representatives from design, construction, maintenance, traffic, etc.). Other states assign the review task to a single department (e.g., traffic safety).

One state has two teams which annually review work zone safety at selected sites. One team conducts field evaluations, while the other collects and analyzes historical accident information. About one-half of the states surveyed formally invite local FHWA representatives to participate in their review program.

## Accident Evaluations

Many states reported that they have a difficult time collecting and analyzing work zone accident data in a timely manner. Usually, the highway agencies must interact with other state and local agencies to obtain the needed accident data, and time delays are often experienced. Many agencies also reported that it is difficult to properly locate work zone accidents relative to traffic control features. Thus, the accident data cannot always be used effectively to evaluate traffic control problems.

Twenty-two of the responding states indicated that they have adopted statewide policies and procedures for collecting and analyzing work zone accident data. There is great variation among the states which do have policies and procedures regarding how the data are collected and who collects the data, however.

## DISCUSSION OF SURVEY FINDINGS

Like other state highway agencies, the Texas State Department of Highways and Public Transportation has adopted specific policies and procedures for work zone traffic control and safety in response to FHPM 6-4-2-12. These have been incorporated in Administrative Order No. 7-79 which is presented in Appendix B. In this section of the report, specific policies and procedures developed by other states are compared to those implemented in Texas. To facilitate the comparisons, the Texas policies and procedures for work zone traffic control, as outlined in the administrative order, are re-stated herein. Where appropriate, innovative approaches used in other states which may be applicable in Texas are identified and discussed.

### Traffic Control Plans

#### *Texas Policy*

*A Traffic Control Plan is a plan for the handling of traffic through a construction project. These plans may range in scope from a very detailed TCP for a specific project, to a reference to standard plans and/or a reference to a section of the Texas Manual on Uniform Traffic Control Devices. The TCP should be developed during the planning and design phases of the project. On major projects where complicated movement of traffic is required, a layout of detours and a sequence of work along with a signing layout should be included. On minor projects, the TCP can usually be handled by a Special Provision or shown on the Specification Data Sheets.*

*In addition to the necessary barricades, pavement markings, warning signs and other traffic control devices, the TCP should include temporary barriers and illumination where applicable.*

*The Department will develop the TCP; however, the Contractor may propose his own TCP and use it after approval by the Department. On Federal-aid projects, approval of any Contractor-proposed revision or major revision to the TCP will also require prior approval by the Federal Highway Administration.*

*When conditions warrant, minor or emergency changes to the TCP may be authorized immediately by the Department's responsible person. If substantial changes are made, the changes should be documented and submitted for review.*

*A Traffic Control Plan should also be utilized on all maintenance activities. Compliance with the Texas Manual on Uniform Control Devices will be required. Standard type barricades and signing layouts on low-volume highways will be considered as the Traffic Control Plan (TCP) under most maintenance activities. However, a more detailed TCP may be necessary for major maintenance activities on high-volume highways or where unusual traffic conditions prevail.*

(Note: The Texas policy is supplemented for smaller projects with Standard Barricade and Construction Sheets.)

The survey responses from the various states concerning Traffic Control Plans varied widely, and several states reported innovative approaches to TCP development. The innovative approaches, for the most part, were aimed at assisting the TCP preparers in selecting and developing an appropriate traffic control strategy. One such approach identified in the survey involves distinguishing projects into categories requiring various levels of traffic control (Florida, Maine, and Wisconsin). Other states reported the use of TCP checklists (Minnesota, Georgia, Mississippi, and California), personnel responsibility lists (Michigan and Utah), and finally the use of flowcharts (New Hampshire) to aid in the TCP development process.

Alabama, Kentucky, and North Carolina have established certain traffic control requirements which must be addressed in every TCP. This practice is similar to the use of a checklist. One disadvantage of such a practice (and to checklists in general) is that it may encourage a false sense of TCP completion. On the other hand, one advantage is that it provides a fairly complete list of traffic control concerns which may encourage a TCP preparer to consider all aspects of traffic safety and operations.

A TCP checklist for construction/maintenance projects could be of benefit in Texas. Such a checklist would aid in the TCP review process as a minimum. An example of a checklist is contained in Appendix C.

A personnel responsibility list relative to work zone traffic control could also be utilized in Texas. The Department has an established job classification system which includes a written description of job duties. Traffic control responsibilities could be included in these job duty descriptions. Appendix D contains an example of this practice.

The categorization of projects could be of benefit; however, it is difficult to segregate all construction, maintenance and/or reconstruction operations into logical groups. The multiplicity of projects and project types may make operational classification of projects unrealistic. Nevertheless, an example of this practice used by one state is contained in Appendix E.

#### Responsible Person

##### *Texas Policy*

*The Engineer will designate a qualified Departmental person to observe implementation of the Traffic Control Plan with authority to assure compliance on each project, including maintenance activities. This person shall make frequent inspections of the traffic control devices including night inspections, which include a check of reflectivity of the traffic control devices. In addition, the District Safety Review Team (Administrative Order No. 33-72) and the District Traffic Control Coordinator (Administrative Order No. 35-77) will periodically review the project for compliance with the TCP.*

*Contractors will be required to designate a competent person on each contract to be readily available to assure compliance with the approved TCP.*

(Note: Administrative Order No. 35-77 is contained in Appendix F and Administrative Order No. 33-72 is contained in Appendix G.)

Of the 44 state agencies responding in the survey, 21 (48%) delegated the responsibility of implementation and inspection to the Project or Resident Engineer. Five of these 21 agencies give Resident Engineers primary responsibility on all projects, 7 states specify Project Engineers for smaller projects and other additional personnel for larger more complex projects, and 9 states use a Project Engineer for all projects with no size differentiation.

A few states have created new positions to handle work zone traffic control responsibilities. For example, in Pennsylvania the position of Civil Engineer II has been created, and individuals with this title are solely responsible for insuring the implementation of TCPs. In Illinois, a new technical position was established in the Bureau of Traffic.

Minnesota has taken the most direct approach to the assignment of responsibility. During the preliminary planning stage, their District Preliminary Design Engineer, District Traffic Engineer, Assistant District Engineer-Construction and District Detail Design Engineer develop a project's scope and determine the needed traffic control concepts. The detailed design is prepared by their District Design Engineer, District Traffic Engineer, Assistant Engineer-Construction, the assigned Resident/Project Engineer, and an FHWA representative. Finally, the Resident/Project Engineer is responsible for the implementation of the TCP in the field. The Minnesota approach is beneficial because the person responsible for implementation is also involved with the development of the TCP.

Eight states (18%) utilize sub-professionals as the responsible person. Oftentimes, these individuals have little authority and must report to office personnel. For example, in Utah the Traffic Manager reports to the Project Engineer. In Montana, the Project Manager reports to the Supervisor of the Division Construction Section. In North Carolina, the Project Traffic Control Coordinator reports to the Resident Engineer, and in Virginia, the Project Safety Officer reports to the Project Inspector. The only state which utilizes certified sub-professional personnel is Idaho. To clarify this, Idaho was the only responding state which required minimum level competence for certification of sub-professional personnel.



Some of the practices cited above could be of benefit to Texas and other states. For example, the Minnesota approach defines and delegates traffic control responsibility from the initial TCP design and development through the implementation stage. The Idaho approach is unique because it assures that a responsible "sub-professional" will have a minimum knowledge of traffic control.

Pay Items

*Texas Policy*

*"Barricades, Signs and Traffic Handling" should be bid in accordance with the attached Special Specification. Where other traffic control devices and positive barriers are proposed in the TCP, they should be set up as individual bid items in accordance with the present procedures.*

Based on the survey responses, state agencies are handling work zone traffic control pay items in one of four ways:

	<u>Percent</u>
1. Lump sum exclusively	5
2. Lump sum with certain specialty bid items	34
3. Lump sum on small projects and unit pay items on large projects	18
4. Unit pay items exclusively	<u>14</u>
	71

Twelve states (29%) did not provide sufficient information on their treatment of work zone traffic control pay items.

Training

*Texas Policy*

*Two training courses are being developed for implementation by June 1979. One course will be directed toward Resident Engineers, District and Division staffs. Another course will be directed toward field personnel who will actually implement the TCP. Where at all possible,*

*these training courses will be presented at the District level. A letter of completion will be presented to personnel completing the training course. This training effort will be coordinated through File D-18.*

(Note: D-13 now has the responsibility of Training.)

Some apparent voids existed in some of the training policies reported by the states. For example, some states did not specifically identify the individuals who would be required to participate in their training program. Others did not indicate whether their training program was on-going or a one-time program. The more pertinent responses on training are summarized below:

- o Twenty-nine states (66%) identified the intended audience of their employee training program. The balance either did not have a policy or did not provide enough information on their policy to make a determination.
- o Twenty-five states (51%) identified the individual or office responsible for developing and implementing their training program.
- o Twenty-one states (48%) indicated that their training would be recurring, while two states indicated that their training would be only a one-time program.
- o Only a few states reported that their training program will be updated as technology or policy changes.
- o Some states indicated that their program is conducted continuously, while others present a training session once a year.

A review of employees targeted for training revealed some interesting findings. Only 15 states (34%) targeted all employees "... responsible for the development, design, implementation and inspection of traffic control." Other states reported that their training was intended for specific groups

of employees such as: construction and/or maintenance personnel (4 states), field-level personnel only (4 states), project-level personnel only (2 states), district level personnel only (1 state) and professional level personnel only (1 state). One state allotted a fixed number of seats available on a first come basis. The balance of the states (38%) did not identify the targeted audience.

The training materials used by the states came from three basic sources: technical groups (i.e., the Institute of Transportation Engineers, National Highway Institute and Transportation Safety Institute); consulting firms (primary Byrd, Tallamy, McDonald, and Lewis, Consulting Engineers); and internally developed programs. A few states reported combining materials from several sources to produce a training program. Seventeen states (39%) reported utilizing technical sources. One state contracted with a consultant to develop a training program, while one other state utilized this same consultant and combined the program with the material developed by the Institute of Transportation Engineers. Seven states (16%) developed in-house training programs. The remaining eighteen states (41%) either did not provide information on their program or had no program yet.

A training program should identify those for whom the program is intended, and it should contain information helpful to all levels of employees. Training should be provided for new employees and to all employees on a recurring basis. Any training materials should also be updated before each offering.

#### Process Review and Evaluation

##### *Texas Policy*

*A review team consisting of representatives of the appropriate Austin Office Division and District will annually review randomly-selected*

*projects throughout the State for assessing the effectiveness of these procedures.*

*Construction zone accidents and accident data will continue to be collected as prescribed in Administrative Circular No. 35-77.*

The survey results indicate that states are using an assortment of approaches to review and evaluate their work zone safety programs. For example, twenty-two states (50%) have assigned this responsibility to a section of the highway agency (i.e., Office of Traffic Safety) or a group of individuals from various sections. Eleven states (25%) have established a separate review team. One state (2%) delegates the review responsibility to the FHWA with the documenting report to be sent to the agency.

Another innovative approach to performing the review and evaluation functions is the use of two review teams. This approach was reported by one state. One review team operates on a local level, maintaining a regular work zone inspection schedule. The second team reviews local inspection reports and conducts annual statewide inspections at randomly selected sites. The inspection reports prepared by the second team are sent to the FHWA Administrator.

Twenty-six states (59%) have enlisted FHWA's participation in their review and evaluation processes. Fifteen states (34%) reported sending inspection reports to the FHWA Administrator.

### Accident Data Collection and Analysis

#### *Texas Policy*

*Construction zone accidents and accident data will continue to be collected as prescribed in Administrative Circular No. 35-77.*

(Note: The statement of policy is contained in the second paragraph of Administrative Order No. 7-79 under process review and evaluation.)

FHPM 6-4-2-12 requires construction zone accident data collection and analysis. From the survey, 8 state agencies (18%) have developed specific statewide programs for these functions.

The remaining states provided little or no information on how they have responded to the Federal requirements. However, it is apparent most states are having difficulty obtaining accurate and timely work zone accident data.

## REFERENCES

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U. S. DEPARTMENT OF TRANSPORTATION  
**FEDERAL HIGHWAY ADMINISTRATION**

**FEDERAL-AID HIGHWAY PROGRAM MANUAL**

VOLUME	6	ENGINEERING AND TRAFFIC OPERATIONS
CHAPTER	4	CONSTRUCTION AND MAINTENANCE
SECTION	2	CONSTRUCTION
SUBSECTION	12	TRAFFIC SAFETY IN HIGHWAY AND STREET WORK ZONES

Transmittal 284  
 HHO-52  
 October 13, 1978

- Par. 1. Purpose  
 2. Authority  
 3. Background  
 4. Policy  
 5. Implementation  
 6. Contents of the Agency Procedures

1. PURPOSE

- \* *The purpose of this directive is to provide guidance and establish procedures to assure that adequate consideration is given to motorists, pedestrians, and construction workers on all Federal-aid construction projects.*

2. AUTHORITY

*This directive is issued under the authority of 23 USC 109(b), 109(d), 315 and 402(a); 23 CFR 1.46(b).*

3. BACKGROUND

*Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) sets forth basic principles and prescribes standards for the design, application, installation, and maintenance of the various types of traffic control devices for highway*

- \* Regulatory material is italicized and is published in the Federal Register under 23 CFR Part 650, Subpart J.

and street construction, maintenance operation, and utility work. The Manual cannot address in depth the variety of situations that occur in providing traffic control in work zones. Although agencies responsible for traffic control and work area protection have attempted to develop some guidelines, a coordinated and comprehensive effort to develop greater uniformity is desirable. National reviews have shown that more attention is needed to insure that the MUTCD is properly implemented on all highway projects.

#### 4. POLICY

It is the policy of the Federal Highway Administration that each highway agency shall develop and implement procedures consonant with the requirements of this directive that will assure the safety of motorists, pedestrians, and construction workers on Federal-aid highway construction projects. The procedures shall be consistent with the provisions of the MUTCD. Highway agencies should be encouraged to implement procedures for non-Federal-aid projects and maintenance operations as well.

#### 5. IMPLEMENTATION

The FHWA Division Administrator shall review and approve the highway agency's implementation of its procedures at appropriate intervals. The FHWA shall take appropriate action to assure that the highway agency's procedures are being followed and achieve the results intended. Major revision in established procedures shall be submitted to the FHWA Division Administrator for information.

#### 6. CONTENTS OF THE AGENCY PROCEDURES

The agency's procedures shall include, but not necessarily be limited to the following:

##### a. Traffic Control Plan (TCP)

- (1) A traffic control plan is a plan for handling traffic through a specific highway or street work zone or project. These plans may range in scope from a very detailed TCP designed solely for a specific project, to a reference to standard plans, a section of the MUTCD, or a standard highway agency manual. The degree of detail in the TCP will depend on the project complexity and traffic interference with construction activity.



- (2) Traffic control plans shall be developed for all projects and be included in plans, specifications, and estimates (PS&E's) and shall be consistent with Part VI of the MUTCD.
- (3) The scope of the TCP should be determined during the planning and design phases of a project.
- (4) Provisions may be made to permit contractors to develop their own TCP's and use them if the highway agency and the FHWA find that these plans are as good as or better than those provided in the PS&E.
- (5) Two-lane, two-way operation on one roadway of a normally divided highway (TLTWO) shall be used only after careful consideration of other available methods of traffic control.
  - (a) Where the TLTWO is used, the TCP shall include provisions for the separation of opposing traffic except:
    - (1) Where the TLTWO is located on an urban type street or arterial where operating speeds are low;
    - (2) Where drivers entering the TLTWO can see the transition back to normal one-way operation on each roadway; or
    - (3) Where FHWA approves nonuse of separation devices based on unusual circumstances. The Division Administrator may approve exceptions under (5)(a)(3). At the time of approval of any exceptions under (5)(a)(3), the Division Administrator is to submit to the Office of Highway Operations, through the regional office, the identity of the project on which the exception is made and the reason for the exception.

(b) Center line striping, raised pavement markers, and complementary signing, either alone or in combination, are not considered acceptable for separation purposes.

- b. Responsible Person. The highway agency shall designate a qualified person at the project level who will have primary responsibility and sufficient authority for assuring that the TCP and other safety aspects of the contract are effectively administered. While the project or resident engineer may have this responsibility, on large complex projects another person should be assigned at the project level to handle traffic control on a full-time basis.
- c. Pay Items. The PS&E should include unit pay items for providing, installing, moving, replacing, maintaining, and cleaning traffic control devices required by the TCP. Suitable force account procedures may be utilized for traffic control items. Lump sum method of payment should be used only to cover very small projects, projects of short duration, contingency, and general items. Payment for traffic control items as incidental to other items of work should be discouraged.
- d. Training. All persons responsible for the development, design, implementation, and inspection of traffic control shall be adequately trained.
- e. Process Review and Evaluation.
- (1) A review team consisting of appropriate highway agency personnel shall annually review randomly selected projects throughout its jurisdiction for the purpose of assessing the effectiveness of its procedures. The agency may elect to include an FHWA representative as a member of the team. The results of this review are to be forwarded to the FHWA Division Administrator for review and approval of the highway agency's annual traffic safety effort.
  - (2) Construction zone accidents and accident data shall be analyzed and used to continually correct deficiencies which are found to exist on individual projects, and to improve the content of future traffic control plans.

APPENDIX B

COMMISSION  
REAGAN HOUSTON CHAIRMAN  
DEWITT C. GREER  
A. SAM WALDROP

**STATE DEPARTMENT OF HIGHWAYS  
AND PUBLIC TRANSPORTATION**

AUSTIN, TEXAS 78701

March 26, 1979

ENGINEER-DIRECTOR  
B. L. O'BERRY

IN REPLY REFER TO  
FILE NO. D-5, D-6,  
D-8, D-18 & D-20

ADMINISTRATIVE ORDER NO. 7-79

TO: DISTRICT ENGINEERS, ENGINEER-MANAGER  
AND DIVISION HEADS

SUBJECT: TRAFFIC SAFETY IN HIGHWAY AND STREET WORK ZONES

Gentlemen:

As part of the national effort to increase safety in construction work zones, the Federal Highway Administration has issued regulations to provide guidance and to establish procedures for insuring that adequate consideration be given to motorists, pedestrians, and construction and maintenance workers. These regulations are included in the Federal-Aid Highway Program Manual issued on October 13, 1978, in Volume 6, Chapter 4, Section 2, Subsection 12, copies of which have been previously furnished to your office.

The following procedures are established for the Department covering the Traffic Control Plan, responsible person, pay items, training and process review and evaluation.

1. Traffic Control Plan (TCP)

A Traffic Control Plan is a plan for the handling of traffic through a construction project. These plans may range in scope from a very detailed TCP for a specific project, to a reference to standard plans and/or a reference to a section of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). The TCP should be developed during the planning and design phases of the project. On major projects, where complicated movement of traffic is required, a layout of detours and a sequence of work along with a signing layout should be included in the P.S.&E. On minor projects, the TCP can usually be handled by a Special Provision or shown on the Specification Data Sheets.

In addition to the necessary barricades, pavement markings, warning signs and other traffic control devices, the TCP should include temporary barriers and illumination where applicable.

The Department will develop the TCP; however, the Contractor may propose his own TCP and use it after approval by the Department. On federal-aid projects, approval of any Contractor proposed revision or major revision to the TCP will also require prior approval by the Federal Highway Administration.

When conditions warrant, minor or emergency changes to the TCP may be authorized immediately by the Department's responsible person. If substantial changes are made, the changes should be documented and submitted for review.

A Traffic Control Plan should also be utilized on all maintenance activities. Compliance with the Texas Manual on Uniform Control Devices will be required. Standard type barricades and signing layouts on low-volume highways will be considered as the Traffic Control Plan (TCP) under most maintenance activities. However, a more detailed TCP may be necessary for major maintenance activities on high-volume highways or where unusual traffic conditions prevail.

## 2. Responsible Person

The Engineer will designate a qualified Departmental person to observe implementation of the Traffic Control Plan with authority to ensure compliance on each project, including maintenance activities. This person shall make frequent inspections of the traffic control devices including night inspections, which include a check of reflectivity of the traffic control devices. In addition, the District Safety Review Team (A.O. No. 33-72) and the District Traffic Control Coordinator (A.C. No. 35-77) will periodically review the project for compliance with the TCP.

Contractors will be required to designate a competent person on each contract to be readily available to assure compliance with the approved TCP.

## 3. Pay Items

"Barricades, Signs and Traffic Handling" should be bid in accordance with the attached Special Specification. Where other traffic control devices and positive barriers are proposed in the TCP, they should be set up as individual bid items in accordance with the present procedures.

#### 4. Training

Two training courses are being developed for implementation by June, 1979. One course will be directed toward Resident Engineers, District and Division staffs. Another course will be directed toward field personnel who will actually implement the TCP. Where at all possible, these training courses will be presented at the District level. A letter of completion will be presented to personnel completing the training course. This training effort will be coordinated through File D-18.

#### 5. Process Review and Evaluation

A review team consisting of representatives of the appropriate Austin Office Division and District will annually review randomly selected projects throughout the State for assessing the effectiveness of these procedures.

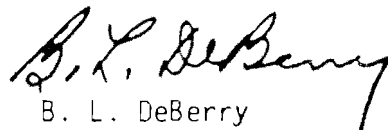
Construction zone accidents and accident data will continue to be collected as prescribed in Administrative Circular No. 35-77.

These procedures shall govern for both State and Federal-aid projects. File D-5, D-6, D-8, D-18 and D-20 personnel are available to assist the Districts in the application of this Order.

The attached Special Specification shall be used beginning with the July, 1979, letting.

This Order shall remain in effect until manual changes are issued incorporating the provisions of this Order into the appropriate Division manuals.

Sincerely yours,



B. L. DeBerry  
Engineer-Director

Attachment

Distribution:

Division Heads  
District Engineers  
Engineer-Manager  
Design Engineers  
Traffic Engineers  
Maintenance Engineers  
Construction Engineers  
Resident Engineers



CHECKLIST FOR TRAFFIC CONTROL

I N D E X

	<u>PAGE NO.</u>
<b>I. Preliminary Design Stage</b>	
1-10 Detour . . . . .	1-3
11-16 Traffic Carried Thru Project . . . . .	3-4
 <b>II. Detail Design Stage - General Checklist</b>	
20 Temporary Traffic Control Devices. . . . .	4-5
21 Signs. . . . .	5-6
22 Signals. . . . .	6
23 Lighting . . . . .	6-7
24 Barrier. . . . .	7
25 Impact Attenuators . . . . .	7
26 Experimental Traffic Control Devices . . . . .	8
27 Crossovers . . . . .	8
28 Equipment and Material Storage . . . . .	8
29 Parking. . . . .	8
30 Access to Work Site. . . . .	8-9
31 Temporary Pavement Markings. . . . .	9
32 Striping Removal . . . . .	9
33 Temporary Delineation. . . . .	9
34 Flashing Warning Lights. . . . .	10
35 Steady Burns . . . . .	10
36 Inplace Signs. . . . .	10
37 Flagpersons, etc . . . . .	10
38 Winter Suspension. . . . .	11
39 Advisory Speeds - Limits . . . . .	11
40 Special Devices. . . . .	11
41 Extra Protection for Pedestrians, etc. . . . .	11
42 Publicity. . . . .	11
43 Utilities. . . . .	11
44 Dust Control for Bridge. . . . .	12
 <b>III. Traffic Provisions</b>	
50-56 . . . . .	12-13
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60- . . . . .	13-15

CHECKLIST FOR TRAFFIC CONTROL

Date \_\_\_\_\_

S.P. \_\_\_\_\_

Location \_\_\_\_\_

Letting Date \_\_\_\_\_

<u>DETOUR</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>
1. Will traffic be detoured? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Have various detours been compared and analyzed? If yes, is the detour adequate in terms of: . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A. Weight - Spring Restrictions . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Height - Width. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Wide loads. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Capacity. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Oversize load route . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Adequate Traffic Control Devices. . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Railroad crossings and controls . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Geometrics (turning radii, etc.). . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Bridge restrictions and other structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no for A through I, what corrective action can be made?				
3. A. Will trunk highway detour conflict with other traffic in this traffic corridor? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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ACTION TAKEN



CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>
3. B. Have other affected districts or states been notified? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
List when, who, and phone numbers.				
4. If detour is to be established on other than trunk highways, has preliminary contact been made with: . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A. County . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. City . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Township . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
List when, who, and phone numbers.				
5. Will all fronting businesses have acceptable ingress and egress? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A. Local and commercial traffic provided for? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Special business signing . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Can all municipalities be served by the detour? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Can detour be carried over winter (snow removal)? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are local motorists detours (alternative routes) available? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>
9. Should the following be contacted?					
A. School bus . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
B. Public transit . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
C. Police, Fire and Ambulance . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
D. Postal Mail Route . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
E. Others . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If yes, list who, when and phone numbers.					
10. Establishment of Detour form been filled out? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<u>TRAFFIC CARRIED THRU PROJECT</u>					
11. Will capacity be restricted? If yes,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A. Where will the excess traffic be diverted?					
B. Will alternate routes handle traffic?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
C. Have local governments been contacted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
List who, when, phone numbers.					
12. Consider staging (ie. lengths of permitted construction). . . . .					
A. Include in plans?. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Let Contractor plan. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
C. Can Contractor stage work differently than planned? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
13. Bypasses or temporary widening needed,						
A. What standards? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(1) Alignment						
(2) Design Speed (____)						
B. Who designs? (Designer, Project Engr., Contractor). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Locations determined . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Minimum lane width (____)						
A. What effect on oversize load permits?						
15. Number of lanes maintained in each direction						
A. At all times (____) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. During rush hours (____) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Reversible lanes needed (____).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16. Consider winter for carrying traffic						
A. Adequate or special traffic control devices . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Snow removal and maintenance. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
17. . . . .						

GENERAL CHECKLIST

20. Temporary traffic control devices needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A. State provided? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	YES	NO	N/A	SPEC PROV	PLAN DET	TYP SPEC
20. B. Contractor provided. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(1) Contract items . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
(a) Lump sum . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(b) Itemized . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(c) Combination. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Incidental . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(a) Total. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
(b) Temporary Lane closures						
(3) If unforeseen and additional traffic control devices are furnished, how will they be paid for?						
(4) Inspect Contractor's traffic control devices in advance of installation. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
21. Signing by State Contractor						
A. State or Contractor maintains						
(1) Clean and wash frequency ( _____ )						
(2) State or Contractor inspects						
(a) Frequency required ( _____ )						
(3) Name and phone numbers required, whose;						
B. Traffic control layout prepared for signing. . . . .						
(1) In plans . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Available prior to letting of project? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
21. B. (3) Contractor provides? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Special, traffic delay, or advance signs needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Cross road signing . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Who to do: Contractor (Spec Prov) _____ Mn/DOT _____						
22. Temporary signals needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A. Contractor installed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(1) State furnished equipment (request letter). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
(2) Manual, fixed time, or actuated. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. State to furnish and install? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Inplace signal needs to be kept operational. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(1) Shutdown time _____						
D. Agreement with local municipality. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
23. Temporary street lighting needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Wood poles . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Breakaway poles. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. State or Contractor installs . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
D. State-furnished equipment (request letter). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E. Exhibit or agreement with power company needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC</u> <u>PROV</u>	<u>PLAN</u> <u>DET</u>	<u>TYP</u> <u>SPEC</u>
23. F. S.O.P. located? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
G. Inplace lighting needs to be kept operational. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
24. Temporary barrier needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Contractor or State furnish						
B. Contractor or State install						
C. Contractor or State maintain						
D. Protection for traffic . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E. Protection for work persons. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F. How to measure . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
G. Concrete median barrier or platebeam guardrail. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
H. Incorporation into final barrier . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I. Temporary 3-cable guardrail needed? .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
J. Delineation of barrier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(1) Electrical devices or reflectorized?						
K. Retain inplace or add for continuity? .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Temporary impact attenuators needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
A. Contractor or State furnish . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
B. Contractor or State install . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
C. Contractor or State maintain. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
D. Type						

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
26. Experimental traffic control devices required (mechanical flagman, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Has documentation been completed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
27. Which crossovers cannot be used by Contractor . . . . .				<input type="checkbox"/>		
A. Included time restriction in special provisions? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Marked contractor equipment required for using crossovers . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
28. Where can Contractor store equipment, construction material, and waste material?						
A. On site with flashers or other protection . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Can be stored 30' (____') from edge of roadway. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Designated storage site. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
29. Where can Contractor's employees park personal vehicles?						
A. On site? . . . . . or off project _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Will shuttle services be required? . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
30. Special considerations for access to work site. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC</u> <u>PROV</u>	<u>PLAN</u> <u>DET</u>	<u>TYP</u> <u>SPEC</u>
30. A. Limited accesses, required turn lanes, hour restrictions, specific locations.						
B. Flagperson at trunk highway access (following traffic)						
31. Temporary pavement markings required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A. State or Contractor install?						
B. State or Contractor maintain						
C. Paint; where _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
D. Tape: where _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E. Raised pavement markers. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
F. Pay item and how to measure. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
32. Striping removal required?(Std. Spec. 2102)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
A. How much and how to be removed . . . .				<input type="checkbox"/>	<input type="checkbox"/>	
B. Centerline . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Edgeline . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
D. Contractor or State. . . . .				<input type="checkbox"/>		
E. Remove versus overlay. . . . .				<input type="checkbox"/>		
F. Pay item . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
33. Temporary post-mounted delineation needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A. Contractor or State install. . . . .				<input type="checkbox"/>		
B. Contractor or State maintain . . . . .				<input type="checkbox"/>		
C. Specify color and type . . . . .				<input type="checkbox"/>		

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ACTION TAKEN



CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
34. Flashing warning lights needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
A. Any equipment overnight within 30' or (____') of roadway? . . . . .				<input type="checkbox"/>		
B. All excavations exceeding ____ inches . within 30' of roadway. . . . .				<input type="checkbox"/>		
C. Construction roadside hazards. . . . .				<input type="checkbox"/>		
D. State or Contractor furnished. . . . .				<input type="checkbox"/>		
E. State or Contractor maintain . . . . .				<input type="checkbox"/>		
F. Pay item . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
35. Steady burn warning lights needed? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
A. Required for edge of roadways, drop- off of ____ inches in lengths over ____ . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Required for overlay projects where dropoff exceeds ____ for over ____ length . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Spacing (____')						
36. Inplace signs have to be removed or re- located (Std. Spec. 1712). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
A. Contractor or State. . . . .				<input type="checkbox"/>		
37. Are flagpersons, pilot cars, and two-way radio communications necessary? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Lighting needed for flagperson? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
38. Winter suspension: Who reviews and maintains? (Std. Spec. 1404) . . . . .						
A. State or Contractor. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
39. Speed limits, advisory limits, and minimum speed limits considered? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
40. Any special devices required? (electric arrow board, snow fence, permanent barricades, etc.) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
41. Extra protection required for:						
A. Pedestrians. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
(1) Elderly. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
(2) Handicapped. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Bicyclists . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Snowmobiles. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
D. Other trail users. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E. School area and crossings. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F. Playgrounds and Parks. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
42. Extra publicity required prior to submitting plan . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC</u> <u>PROV</u>	<u>PLAN</u> <u>DET</u>	<u>TYP</u> <u>SPEC</u>
43. Do utilities operations affect traffic control? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
44. Dust control on bridge deck repair needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
50. Can Contractor restrict roadway during						
A. a.m. or p.m. rush hours. . . . . (refer to item 15)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(1) One direction (substantial difference)						
(2) Both directions						
B. Hunting and fishing opening dates. . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Local celebrations . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
D. Holiday or weekends. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E. Other special events . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
F. Over night . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
51. Nighttime hour of operation required be- tween ____ hour and ____ hour . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Special precautions needed? (ie., lighting, clearance lights on equip- ment, etc.). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
52. Substantial direction difference in traffic flow which would permit re- versible lanes . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
53. Any changes that cannot be made con- currently (for traffic routing, fire, police, etc.)?. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
54. Can two adjacent street or road crossings be closed at the same time? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
55. Will source of material off the project interfere with traffic? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. On and off project limits. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Certain roads not to be used (environmental, recreational, etc.). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
56. Advance notice required by Contractor for any change in traffic (_____) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC PROV</u>	<u>PLAN DET</u>	<u>TYP SPEC</u>
<u>TIME PROVISIONS</u>						
60. Working Day contract with respect to traffic provisions . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Exception (sod maintenance). . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
61. Intermediate completion time or date . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
62. Starting date or completion controlled by:						
A. School closing or opening. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Holidays . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Fishing or hunting openers . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
D. Another project. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E. Impact to public, exact starting date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
63. Should an early award be requested?. . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
64. Is a Working Day other than as Standard Specification? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Define Work Day computations (6 hr. or 18 hr. days) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
65. Is there a conflict between working hours and local ordinances? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
A. Noise . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
B. Air . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C. Water. . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

CHECKLIST FOR TRAFFIC CONTROL


	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>SPEC</u> <u>PROV</u>	<u>PLAN</u> <u>DET</u>	<u>TYP</u> <u>SPEC</u>
66. Should there be double shift and/or weekend work? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
67. Will Working Days be charged on weekends and holidays? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
68. Will Working Days be charged between November 15 and April 15? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
69. Should there be other than ordinary Liquidated Damages? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
70. Should there be an additional penalty clause? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
71. Will a Suspension of Work Order be written because of work under another contract? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
72. Will a Suspension of Work Order be written for winter? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
73. Are there present or future contracts in the immediate area that may affect traffic or detour traffic which affects contractor operation? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
74. Is there a possible delay caused by work under another contract? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
75. Can Contractor start before starting date? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
76. Should there be an incentive for early completion? . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

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ACTION TAKEN

APPENDIX D

3310 (6.75)

 <p><b>DEPARTMENT REGULATION</b></p>	<p>EFFECTIVE DATE 05-08-78</p>	<p>IDENTIFIER DR 5200.01</p>
	<p>RESPONSIBLE ORGANIZATION Bureau of Highways</p>	<p>SUPERSEDES DR 5200.01 DATED 02-23-73</p>
<p>SUBJECT: Maintaining Traffic in Construction Zones</p>		

I. PURPOSE:

To provide guidance for maintaining traffic in construction areas.

II.

PROCEDURE:

A. RESPONSIBILITY:

B. ACTION:

\* Design Division

1. Determines, in preliminary form, and, two weeks before the G.I. (grade inspection), includes in the G.I. plans, any suggested stage construction, including crossroad treatments, temporary roads, and detours which may be required by the work for all road or bridge projects.

\* District Traffic &  
\* Safety Engineer

2. Accompanies the grade inspection party and, within three weeks after G.I., following consultation with the District Construction Engineer, sends to the Engineer of Design recommendations on stage construction with a copy to Engineer of Traffic & Safety.

\* Senior District  
\* Engineer

3. Consults with the District staff engineers, within three weeks after G.I., to review (or establish, if required) proposed detour and to coordinate its further review with affected local jurisdictions; obtains proper approval, and notifies the Engineer of Design and other affected Departmental personnel.

\* Design Division

4. Plots the final stage construction, crossroad treatments, temporary roads, and detour recommendations on the plans in sufficient detail and scale, showing all approaches to the construction area, and furnishes the District Traffic & Safety Engineer with reproducible plans, six weeks after G.I., upon which to show traffic control devices and Construction Influence Area (CIA).

\* Indicates change



RESPONSIBLE ORGANIZATION Bureau of Highways	EFFECTIVE DATE 05-08-78	IDENTIFIER DR 5200.01	PAGE OF 2 4
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II. PROCEDURE:

A. RESPONSIBILITY:

B. ACTION:

\* District Traffic & Safety Engineer

5. Sends to the Design Division, nine weeks after G.I., (after consulting with District Construction Engineer for comments and concurrence) the CIA limits, working hour restrictions, and marked prints, special drawings, or reference to figures in the Michigan Manual of Uniform Traffic Control Devices showing selection of, and locations for, traffic control devices, together with pay items and estimated quantities; sends copy of these recommendations to the Engineer of Traffic & Safety.

\* If appropriate, requests the Engineer of Traffic & Safety to prepare and send to the Design Division plans, specifications, quantities, and estimated costs needed for installation of electrical devices.

\* Engineer of Traffic & Safety

7. Reviews the recommendations submitted by the District Traffic & Safety Engineer for completeness and conformance to standards within ten weeks after G.I.

\* Resolves any differences and advises the Engineer of Design of changes.

9. If an Interstate project involves force account work by State, county, or city forces on traffic control devices:

District Traffic & Safety Engineer

a. Furnishes the Engineer of Traffic & Safety with plans showing the selection and location for such devices, together with quantities and cost estimate, to be subsequently forwarded to the Design Division.

\* Design Division

b. Prepares a letter of justification, addressed to the Federal Highway Administration, requesting Federal aid participation approval before authorizing work on the project and sends it, with plans and specifications, to the Chief Deputy Director for signature.

Design Division

10. Prepares final plans (construction prints) and quantity sheets with the necessary special details included, and sends them to the District Construction Engineer two months before advertising date for coordinated review by District staff engineers.

\* Indicates change

RESPONSIBLE ORGANIZATION	EFFECTIVE DATE	IDENTIFIER	PAGE OF
Bureau of Highways		DR 5200.01	3 4

## II. PROCEDURE:

### A. RESPONSIBILITY:

### B. ACTION:

- |   |  |
|---|--|
| <p>* Design Division</p> <p style="margin-left: 10px;">* District Construction Engineer and</p> <p style="margin-left: 10px;">* District Traffic &amp; Safety Engineer</p> <p style="margin-left: 10px;">* District Construction Engineer</p> <p style="margin-left: 10px;">Senior District Engineer</p> <p style="margin-left: 10px;">Traffic &amp; Safety Division</p> <p style="margin-left: 10px;">Testing &amp; Research Division</p> <p style="margin-left: 10px;">Project Engineer</p> <p style="margin-left: 10px;">* Designated Safety Inspector</p> | <p>11. Sends prints to the Engineer of Traffic &amp; Safety for final review. If local roads may be used for detours, sends prints to local jurisdiction for final review.</p> <p>12. Incorporates any final changes on plans and circulates tracings for signature one month before advertising date.</p> <p>13. Reviews with the contractor and affected subcontractors the provisions and contract requirements for construction area traffic control and safety after the successful bidder is determined and immediately following, or during, the general preconstruction meeting with the contractor.</p> <p>14. Records minutes of all preconstruction and all traffic safety meetings in detail.</p> <p>15. Informs the Public Information Section, by teletype, of changes in routes, opening of detours or temporary roads, and the closing of same as soon as a firm date has been established.</p> <p>16. If requested by the Construction Division, provides for the installation of traffic control devices for which the Department is responsible.</p> <p>17. Samples and inspects all contractor-furnished traffic control devices using the same procedures and frequencies applied to other items furnished for the project.</p> <p>18. Requires the contractor to have applicable traffic control devices in place for traffic operation before construction commences.</p> <p>19. Designates a safety inspector to periodically inspect all traffic control devices on project to ensure compliance with specifications and the Michigan Manual of Uniform Traffic Control Devices.</p> <p>20. Inspects all traffic control devices on project periodically to ensure compliance with specifications and Michigan Manual of Uniform Traffic Control Devices.</p> |
|---|--|

\* Indicates change

RESPONSIBLE ORGANIZATION Bureau of Highways	EFFECTIVE DATE 05-08-78	IDENTIFIER DR 5200.01	PAGE 4 OF 4
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II. PROCEDURE:

A. RESPONSIBILITY:

B. ACTION:

\*  
\*  
\*

Designated Safety Inspector

21. Documents inspection findings on Form 1122, Inspector's Daily Report, as appropriate.

- a. Advises the contractor of all change or correction requirements.
- b. Uses a safety work order as necessary to authorize all urgent operational corrections.

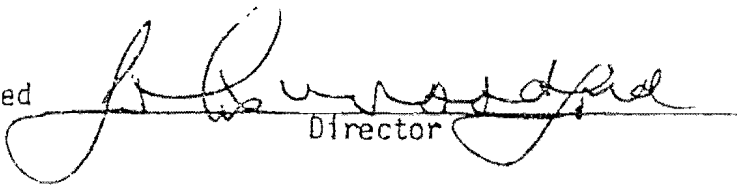
District Traffic & Safety Engineer

22. Inspects project periodically with Project Engineer and gives notice of operational deficiencies and suggested improvements, confirmed in writing if necessary, to the District Construction Engineer and,

- a. If utility or permit operations, to the District Utilities & Permits Engineer.
- b. If maintenance operations, to the District Maintenance Engineer.

23. If traffic control devices become a permanent part of the facility, accompanies the final inspection party for acceptance of project.

Approved

  
 Director

5/8/78  
 Date

## TRAFFIC SAFETY IN HIGHWAY AND STREET WORK ZONES

The purpose of this procedure is to define the methodology for handling traffic on all types of highway and street construction projects, maintenance operations, and utility work, to assure the safe movement of vehicles and pedestrians past or through the work zone while providing maximum safety for personnel and equipment on the job. The documentation developed to implement such strategies is termed the Traffic Control Plan (TCP).<sup>1</sup>

TCP REQUIREMENTS

The TCP is prepared by the District Design staff, in coordination with Traffic and Construction personnel as necessary, early in the Final Design phase of the Facilities Development Process (FDP). Although traffic handling, detours,<sup>2</sup> etc., are important considerations during earlier phases of the FDP, the design elements of the project must be largely established before the TCP can be finalized.

As specified in FHPM 6-4-2-12:

The TCP should provide for appropriate treatment of all significant hazards likely to be caused by or encountered during the project work. It should cover such items as signing, application and removal of pavement markings, construction scheduling and hours of work, flagging, use of pilot cars, methods and devices for delineation and channelization, placement and design of barriers and barricades, control of pedestrians, storage of equipment and materials (along or near the traveled way), removal of construction debris, geometrics of detours, access for emergency vehicles, clear roadside recovery areas, provision for disabled vehicles, roadway lighting (of obstacles and hazards), movement of construction equipment, length of project under construction at any one time, methods of minimizing construction time consonant with safety, speed limits and enforcement, surveillance and inspection, documentation, and modification of these items under conditions of darkness or inclement weather.

All federal-aid projects will require a TCP as part of the P.S. & E. Preparation of TCP's for non-federally funded projects is encouraged, albeit left to the discretion of the District and the Design Section coordinator.

<sup>1</sup>The requirement for developing TCP's for all federal-aid highway projects is established in FHPM 6-4-2-12. The elements for all such plans, for federal-aid as well as for non-federally funded projects, are to be developed consistent with Part 6 of the "Manual on Uniform Traffic Control Devices" (MUTCD).

<sup>2</sup>Potential detours should be reviewed to determine if they can handle the detoured traffic. If construction or reconstruction of detours becomes necessary, such should be established early enough in the FDP to allow project development to proceed to construction without needless delays. In this regard, the Districts shall be responsible for appropriate and adequate awareness and input from all affected and interested parties (local units of government, businesses, citizens, etc.).

Whether or not a TCP is prepared, the traffic control strategy and general features of its implementation are required to be discussed to an appropriate level of detail in the Design Study Report.

The level of effort required for each TCP will be variable and dependent upon the nature of the project under consideration. Four general categories of traffic control are recognized, although more than one may be applicable to an entire construction project. These categories are as follows:

#### Category 1

The facility is open to traffic for through movements, except for closure of one lane during daylight hours. This is typical of many short-term operations such as bituminous resurfacing, patching pot holes, sealing cracks or joints, pavement marking, etc. A flagman(men) is typically utilized along with various warning signs and/or devices to provide traffic control.

The TCP for this category of projects will usually be quite brief, and in many instances the mere citing of applicable references in Part 6 of the MUTCD and their deployment may be sufficient. The extent of traffic control measures included in the P.S. & E. will typically involve only their discussion in the special provisions of the contract.

#### Category 2

The facility is open to traffic for through movement, except for closure of one lane for an extended period of time. Bridge deck replacement is a typical example of such types of closures. Advance warning signs and/or devices are typically utilized along with various applications of barrels, barricades, barriers, delineators, temporary marking and signing, etc., as necessary. For the typical two-lane facility, signals and/or regulatory signs may be employed to facilitate alternating traffic movements on the remaining open lane.

The TCP for this category will generally be more detailed than for Category 1, to provide necessary discussion of the traffic control strategy. Again, it may prove advantageous to cite applicable references in Part 6 of the MUTCD and their deployment. The extent of traffic control measures included in the P.S. & E. will typically involve a layout sheet(s) in the plans delineating the application of the traffic controls, in addition to the discussion in the contract special provisions.

#### Category 3

The facility is open to traffic for through movements, except for various closures throughout construction as detailed in stage construction in the P.S. & E. These projects involve the more complex types of construction in rural and/or urban areas, of which interchange reconstruction is a typical example.

The TCP for this category will typically be more detailed than for Category 2 and must specify the traffic control measures for each element of the stage construction. The extent of traffic control measures included in the P.S. & E. will typically involve a layout sheet(s) for each construction stage defining traffic routing and construction signing requirements, in addition to the discussion in the contract special provisions.

Category 4

The facility is closed to through traffic, with access provided for emergency and/or local traffic only. Through traffic (with the possible exception of emergency vehicles) is detoured.

The TCP for this category will specify that the road is closed and that the traveling public will be accommodated by a suitable detour route. The necessary signing, barricades for road closure, and other traffic control devices required on the locale of the project to accommodate and inform the traveling public and to protect local traffic will be a part of the plan. The identity of the detour beyond the locale of the project is the responsibility of the appropriate governmental authority. As in Category 1, traffic control details in the contract work zone, along with the details of the road closure(s) in the immediate contact vicinity, are typically the extent of the traffic control measures included in the contract special provisions of the P.S. & E. Administration of the detour is the responsibility of the governmental authority that maintains the road being detoured, not the contractor. If construction or reconstruction of the detour is necessary in order to accommodate traffic, repair the detour, etc., traffic control measures for such activities will be included in the P.S. & E. to the level of detail necessary, and the necessary improvements to the detour route will be handled by county forces or included in the contract, as appropriate.

The TCP is developed by the District in cooperation with the Central Office and the FHWA, and becomes a part of the construction contract. Traffic control strategies are discussed during TCP development with the Design Section coordinator, the Traffic Section, and the FHWA area engineer, as appropriate. Elements of the TCP necessary to effect its purpose are included in the P.S. & E. documents. Approval of the P.S. & E. by the FHWA will then be considered approval of the TCP.

TCP IMPLEMENTATION RESPONSIBILITY

The responsibility for implementation of the TCP, as well as all other elements and provisions of the contract, is vested with the contractor. The project engineer will monitor the work of the contractor in this regard, and will assure that the required traffic controls are established at the inception of the project and that they will be properly maintained and/or operated during the time that the control situation exists. The controls are to remain in place only as long as they are necessary and will be immediately removed thereafter. Where operations are performed in stages, only those devices pertinent to that particular stage will be in place and/or in use, to avoid confusion for the motorist.

To assure that the contractor has implemented the TCP, the project engineer (or his designated representative) will periodically drive through the controlled areas, observe the motorists passing through the job site, and document the operation of the traffic controls. Both day and night checks (Categories 2, 3, and 4) are considered essential in this regard.

Instead of implementing the adopted TCP elements in the contract, the contractor may choose to develop his own measures if he feels that he can more expeditiously effect the required results. Contractor-developed TCP's are subject to the same reviews and approvals as are other contract changes and will be considered as such.

APPENDIX F

ADMINISTRATIVE CIRCULAR NO. 35-77

To: DISTRICT ENGINEERS, ENGINEER-MANAGER, DIVISION HEADS,  
RESIDENT ENGINEERS AND MAINTENANCE FOREMEN

Date: June 23, 1977

Subject: Construction Signing, Barricading  
and Pavement Markings

Expires: See Below

Reference:

File: D-6, D-8, D-9,  
D-18 and D-20

Gentlemen:

As a part of the national effort to increase safety in construction areas, the FHWA has focused increased attention on traffic control through construction zones. It is felt that possible improvement in traffic control through department projects can be accomplished by strict adherence to the following practices at the district level.

1. More frequent inspections of traffic control devices on construction projects, including monthly night inspections which include a check of traffic control device reflectivity and inspections after each significant change in traffic control on construction and other major projects. Inspections should be documented as to purpose, dates, recommended changes, etc.
2. Assignment of one man in each district to coordinate traffic control devices in all projects at the P.S. & E. stage and periodically review the traffic control devices on the project with the Resident Engineer during the life of the project. Please furnish File D-6 the name and title of the person so assigned in order that all questions relating to traffic control on construction projects directed to the Austin Office can be handled through him. It is suggested this function be assigned to one member of the District Safety Review Team established by Administrative Order No. 33-72.
3. Use of special barricade and construction sign layout sheets in those projects where the standard BC sheets may not adequately cover anticipated conditions.
4. Develop procedures with local enforcement agencies that will insure that the Resident Engineer receives copies of all accident reports on accidents occurring within construction zones. This will provide Resident Engineers with early information on conditions that may require changes and/or corrective measures regarding traffic control devices. Records should be kept on all accidents involving the traveling public on construction projects and should be identified as Investigative Files. There should be only one file kept on each investigation, and this file should be kept in the District Office. File D-20 should be contacted should anyone seek information from these files.

These practices are now utilized in some districts and should be used statewide in the future.

In addition to the above, File D-18 will initiate several revisions to the BC standard sheets to eliminate several areas of concern. For example, the need for

routine laboratory testing of flat surface flexible reflective sheeting will be eliminated.

Other changes, as needed, will continue to be made to the BC standards to improve traffic control through work areas and each project engineer should familiarize himself with the requirements therein. Any comments districts have regarding suggested improvements to the BC standard sheets should be forwarded to File D-18.

As stated in Item 3, the use of special barricade and construction sign layout sheets is encouraged for projects where conditions are not covered on the BC standard sheets. An example of such a project would be the typical "M" project for street widening, which has many side street access points and low speed traffic throughout. File D-18 is considering preparing a separate standard BC sheet for these type projects and would appreciate any recommendations districts may have for sign and barricade arrangements for these projects.

To assist districts in checking reflective quality of both new and old signs and barricades, each district will be furnished test panels of reflective material in each of the colors used on construction projects (white, orange and red) which will be fabricated to minimum brightness values. Reflectivity of signs, barricades, etc., can be checked by comparison of the brightness of the appropriate test panel adjacent to the device being checked under vehicular head lights. It is not necessary that each individual device be checked but only those approaching minimum reflectivity. The Engineer should see that all devices with less than minimum brightness are either washed to achieve minimum brightness or replaced.

File D-6, D-8, D-9 and D-18 personnel are available to assist districts in special application of construction signs and barricades and should be contacted when unusual problems arise.

This Circular expires upon receipt and compliance with the above.

Sincerely yours,



B. L. DeBerry  
Engineer-Director

DISTRIBUTION:

District Engineers  
Engineer-Manager  
Division Heads  
Resident Engineers  
Maintenance Foremen



APPENDIX G

COMMISSION

DEWITT C. GREER, CHAIRMAN  
HERBERT C. PHRY, JR.  
CHARLES E. SIMONS

TEXAS HIGHWAY DEPARTMENT

AUSTIN, TEXAS 78701

November 21, 1972

STATE HIGHWAY ENGINEER  
J. C. DINGWALL

IN REPLY REFER TO  
FILE NO. D-18

ADMINISTRATIVE ORDER NO. 33-72

TO: ALL DIVISION HEADS, DISTRICT ENGINEERS AND ENGINEER-MANAGER

SUBJECT: HIGHWAY SAFETY IMPROVEMENT PROGRAM (ORGANIZATION, FUNCTIONS  
AND RESPONSIBILITIES)

Gentlemen:

The basic purpose of a highway system is to provide a safe, convenient, comfortable and efficient facility for the movement of people and goods. During the last few years there has been a continuing emphasis on the National, State and Local level for improvement of safety features of our highways. This emphasis has been directed at the identification of traffic hazards and high accident locations on existing facilities or such potential deficiencies in planned work and corrective measures to eliminate them either on the ground or in the planning stage.

In order to establish uniform standards and comply with the laws and directives pertaining to the Highway Safety Improvement Program and consolidate functions and responsibilities, the following organizational structures are hereby established:

1. HIGHWAY SAFETY STEERING COMMITTEE

A. This committee shall be composed of the following members:

Chief Engineer of Maintenance Operations (Chairman)  
Bridge Engineer  
Construction Engineer  
Chief Engineer of Highway Design  
Engineer of Secondary Roads  
Director of Insurance  
Program Engineer

- B. The Highway Safety Steering Committee shall have the responsibility to recommend overall policies and practices, as well as statewide priority determinations and review all special problem projects or situations and evaluate the overall Highway Safety Improvement Program.
- C. It will be the duty of the Chairman of the Highway Safety Steering Committee to:
  - 1. Assist and advise the State Highway Engineer in performing his duties as a member of the Governor's Traffic Safety Advisory Committee.
  - 2. Be responsible for coordinating the Department's safety related activity with other federal and state agencies.
  - 3. Serve on the Governor's Traffic Safety Coordinating Committee.
  - 4. Perform such other duties and responsibilities for safety as may be from time to time designated by the State Highway Engineer.

## 2. HIGHWAY TRAFFIC SAFETY SECTION

The Chairman shall establish in the Division of Maintenance Operations a Highway Traffic Safety Section to handle the day to day operational functions pertaining to highway traffic safety as follows:

- 1. Develop and recommend policies and guidelines and prepare directives necessary to accomplish the objectives of this program.
- 2. Establish a procedure for continuous study and identification of those locations and areas along the highways which are hazardous to the driving public. The study and review for this will be built upon a diagnostic team approach utilizing accident records and other procedures as they are developed.
- 3. Establish priorities for remedial action based upon a statewide rating system listing hazardous locations. A procedure for systematic and continuous correction of identified hazards will be included.

4. Assist the various District and Houston Urban Safety Review Teams, when requested, to insure proper coordination between the Districts and Austin Headquarters in matters pertaining to highway safety.

3. FIELD SAFETY REVIEW TEAM

In order to accomplish the purpose of this program, full and complete cooperation and participation of the field must be obtained. Therefore, each of the Districts and the Houston Urban Office will establish a Safety Review Team comprised of not less than three (3) members for the smaller Districts and at least five (5) in the larger Districts. One member of the team shall be designated District Safety Representative and will act as Chairman. The members should be selected from the following positions within the District or comparable positions in the Houston Urban Office:

- Assistant District Engineer
- District Administrative Engineer
- District Maintenance Engineer
- District Design Engineer
- District Traffic Engineer
- District Construction Engineer

The Field Safety Review Team shall be responsible for the following duties:

1. Identifying hazardous locations, sections or design elements on all highways within the District.
2. Recommending to the District Engineer priorities for remedial projects.
3. Review all proposed work including maintenance work prior to the preparation of plans for such projects in order to eliminate wherever possible traffic hazards or unsafe conditions.
4. Review plans for all projects and observe the construction phase of work while in progress and suggest changes when necessary.
5. Review completed projects and evaluate the safety aspects of the facility.
6. Evaluate all corrective safety measures taken on any facility.

7. Disseminate pertinent highway safety information to appropriate personnel within the District.
8. Establish liaison with local enforcement agencies and concerned citizens, individuals or groups pertaining to highway traffic safety.
9. When existing design, construction or maintenance standards or procedures are found to be inadequate or create an unsafe condition, necessary corrective actions should be recommended through the proper channels. If such findings have statewide application, they should be reported to the Chairman of the Highway Safety Steering Committee.

4. MAJOR PROJECT SAFETY EVALUATION COMMITTEE

The Chairman of the Highway Safety Steering Committee shall establish a Major Project Safety Evaluation Committee composed of members (or their representatives) of the Division Level Highway Safety Steering Committee and the appropriate District Level Safety Review Team. At least one representative from each of the following agencies should be requested to meet and work with this committee where their Department is involved.

Department of Public Safety  
Federal Highway Administration  
Governor's Traffic Safety Office  
Texas Education Agency (Drivers Education)  
State Department of Health (Emergency Aid Facilities)

This committee will conduct a safety inspection or review of projects selected by the Highway Safety Steering Committee. Generally, the inspection will be made six months to one year after completion of the project and only major projects would be involved. A report would be prepared stating the findings of the committee and recommending any needed corrective actions as well as suggestions or recommendations on future projects.

The Chairman of the Highway Safety Steering Committee shall appoint a Project Chairman for each project inspected and a District representative will act as co-chairman.

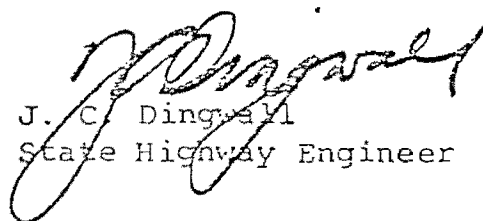
5. FINANCING

Highway Safety Improvement work will be financed from regular construction or betterment programs, regular maintenance funds, funds

available through the Division of Maintenance Operations, or other special funds as may become available.

This Administrative Order shall become effective upon receipt.

Sincerely yours



J. C. Dingwall  
State Highway Engineer

DISTRIBUTION:

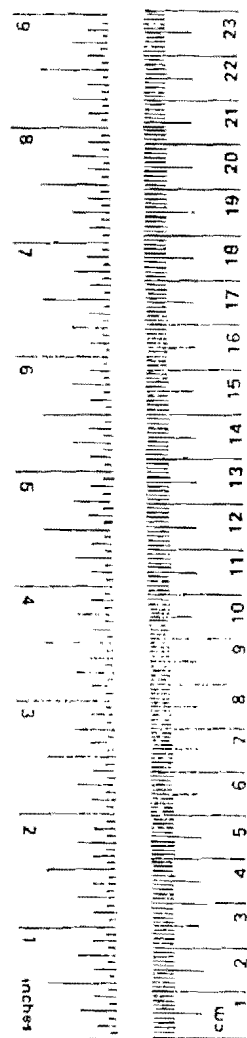
Division Heads

District Engineers

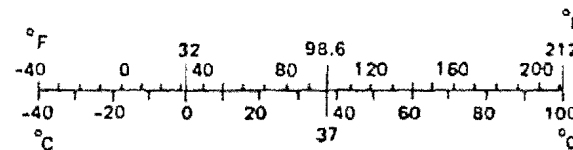
Engineer-Manager .

## METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures			
Symbol	When You Know	Multiply by	To Find
<b>LENGTH</b>			
in	inches	*2.5	centimeters
ft	feet	30	centimeters
yd	yards	0.9	meters
mi	miles	1.6	kilometers
<b>AREA</b>			
in <sup>2</sup>	square inches	6.5	square centimeters
ft <sup>2</sup>	square feet	0.09	square meters
yd <sup>2</sup>	square yards	0.8	square meters
mi <sup>2</sup>	square miles	2.6	square kilometers
	acres	0.4	hectares
<b>MASS (weight)</b>			
oz	ounces	28	grams
lb	pounds	0.45	kilograms
	short tons (2000 lb)	0.9	tonnes
<b>VOLUME</b>			
tsp	teaspoons	5	milliliters
Tbsp	tablespoons	15	milliliters
fl oz	fluid ounces	30	milliliters
c	cups	0.24	liters
pt	pints	0.47	liters
qt	quarts	0.95	liters
gal	gallons	3.8	liters
ft <sup>3</sup>	cubic feet	0.03	cubic meters
yd <sup>3</sup>	cubic yards	0.76	cubic meters
<b>TEMPERATURE (exact)</b>			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature
°C	Celsius temperature		°F



Approximate Conversions from Metric Measures				
Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	
<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
<b>VOLUME</b>				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m <sup>3</sup>	cubic meters	35	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.3	cubic yards	yd <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



\* 1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10:286.