FUNDAMENTALS

OF

HIGHWAY TRAFFIC REGULATION

WILLIAM PHELPS ENO

Yale B. A. 1882, Yale M. A. 1923 for traffic work in the United States; la Decoration de Chevalier de l'Ordre National de la Legion d'honneur 1925 for traffic regulation assistance in France before, during and since the World War; Honorary Member of the Traffic Squad Benevolent Association of the Police Department of the City of New York; Membre Honorarie du Chambre Syndicale des Cochers et Chauffeurs de Voitures de Place de la Seine; formerly Chairman of the Citizens Street Traffic Committee of New York City; Honorary President of the Highway Traffic Association of the State of New York; Chairman of the Advisory Committee for the Highways Transport Committee of the U. S. Council of National Defense and Chairman of the Local Committee for the District of Columbia of the Highways Transport Committee of the U. S. Council of National Defense, etc.

It can be set down as a traffic axiom that familiarity by the Public with the General Highway Traffic Regulations is the Key to effective and economical traffic management. There is no substitute. It is easy to control a trained army but next to impossible to regulate a mob.

I dedicate this book

to the Memory of my dear friend

Senator Robert Hugues Le-Roux

who, as a member of the editorial staff of the Matin, was selected to aid me in starting a campaign in 1909 for better traffic regulation in Paris. From that time until his death in 1925, he never lost interest and was of the greatest assistance in the work

THE ENO FOUNDATION

On April 28, 1921, the Eno Foundation for Highway Traffic Regulation was incorporated under the laws of the State of Connecticut to carry on the work of the founder for Traffic Regulation during his life time and to perpetuate it after his death. It is an eleemosynary institution with sufficient powers for adjustment to suit such changed conditions as may arise in the future in order to maintain and develop its usefulness.

At the death of the founder the Foundation will come into the full enjoyment of a fund of approximately $250,000, the principal of which has already been put in its absolute possession. It is, however, the founder's intention as expressed in his present will to endow it very much more liberally. It may continue after his death as an independent institution or as an integral part of a university as he or his trustees may decide.

The Foundation is governed by a board of twenty-one directors, seven of whom are appointed to control its finances. The other fourteen control its practical and technical activities. Those now in charge of the finances are: Philip G. Bartlett, of New York, President of the Foundation and senior member of the law firm of Simpson, Thacher & Bartlett, David Jay Ely, of New York, Treasurer of the Foundation and with the firm of Simpson, Thacher & Bartlett, Clarence H. Kelsey, President of the Title Guarantee & Trust Company of New York, Reeve Schley, Vice-President of the Chase National Bank of New York, Henry Barstow Platt, of New York, Alfred Hawes of Westport, Conn., and H. H. Sprague, of New York.

The other directors are Major Charles A. Benton, of New York, Professor Arthur H. Blanchard of the University of Michigan, Roy D. Chapin, of Detroit, Dean H. J. Hughes, of Harvard University, Dr. James W. Inches, formerly Police Commissioner of Detroit, Mr. Stephen James, of the Highway Education Board, Washington, Dean A. N. Johnson, of the University of Maryland, Miss Sophie Irene Loeb, of New York, Mr. T. T. McCrosky, of Yale University, Mr. Thomas H. MacDonald, Director of the Bureau of Public Roads, Washington, Mr. Lew R. Palmer, of the Equitable Life Assurance Society, Professor C. J. Tilden, of Yale University, Professor W. M. Daniels, of Yale University, and Williams Phelps Eno, of Washington, D. C., who is chairman of the Board of Directors and acts in both financial and technical capacities.

A Few Hints Which Should be Useful to Those Who Are Trying to Save Lives, Time and Money by Improved Traffic Regulation!

Standardize the General Highway Traffic Regulations!

Make special highway traffic regulations as uniform as possible!

The General Regulations must be clear or they will not be understood, reasonable or they will not be obeyed, short or they will not be read and if they are not read, how can they be anything but useless?

The Council of National Defense Code, originally the official police code of New York, has all these qualifications, and has been in operation since October 30, 1903. It has been successful wherever used to a degree never attained when departed from in principle!

Don't try to regulate too much or you will complicate instead of regulate!

Don't refuse to profit by the past experience of others!

Adopt tried methods first and improve on them afterwards if you can!

The secret of successful and economical traffic regulation is found only in the education of the people to be regulated in the regulations they are expected to follow!

Use simple, inexpensive methods first! The money now wasted on such complicated machinery as is required for synchronized traffic signal lights can be used to materially reduce traffic accidents—try it, and take more time to find out the truth about synchronized traffic lights which are being sold like gold bricks to the inexperienced.

INTRODUCTION

This is my fourth book on highway traffic regulation. The first was entitled "Street Traffic Regulation," published in 1909; the second was entitled "Le Problème de la Circulation," published in Paris in 1912; the third was entitled "The Science of Highway Traffic Regulation," published in 1920.

I would not publish this book quite so soon were it not for the fact that there are several things being done in traffic which are bad and to which the attention of the public and of the officials should be directed at once before they go further. The first and worst is the attempt to synchronize the block system. Others are the elimination of the left hand turn where unnecessary; too many streets chosen for one-way traffic; through traffic streets in cities which are on the same grade as other streets; wrong methods of using paint lines, especially at crosswalks, etc.

Students of traffic are only just now beginning to realize the harm which the synchronized block system is doing because it not only delays traffic and wastes street traffic capacity but because it increases danger instead of safety.

This book is essentially for students of traffic, although it is hoped that it will be interesting to laymen who take an interest in the subject. It is by no means a complete discussion, but is strictly confined to the fundamentals of HIGHWAY TRAFFIC REGULATION. It is written after twenty-five years of intensive application and practical experience preceded by many years of study of the subject here and abroad.

I had intended to include in this book other things besides the absolute fundamentals for the regulation of traffic, but have decided to leave them for a larger book to be prepared later. The things omitted include the Management of Vehicles at Theaters, A Discussion of Refuges as used in Paris and especially of those in London (the working drawings of which have been kindly sent me by Sir Henry Maybury, Minister of Transport), a revision of a paper read before the Harvard Engineering Society on March 8, 1923, entitled "The Traffic Problem of New York City," a history of the development of traffic regulation in the United States from 1899 to the present time, A Method for Snow Removal for Cities, Trimming of Trees on City Streets and Country Highways, Lighting of Roadways, Traffic Police Signals, Training of Traffic Police, Traffic Police Equipment to Reduce their Danger and Increase their Comfort, etc., etc.

WM. P. ENO.

March 3, 1926.

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Copies of this book can be had from the Eno Foundation for Highway Traffic Regulation, Inc. (directly or through your book seller); address, 1771 N Street, Washington, D. C., during the months of December to April, inclusive, and Saugatuck, Fairfield County, Connecticut, during the months of May to November, inclusive. Price per copy, $3.00. Special rates to universities, schools, police departments and traffic committees on application.

The plates for printing the General Highway Traffic Regulations with Safety Rules for Pedestrians, with name of city inserted, can be obtained from Byron S. Adams, 512 11th Street, Washington, D. C., at a cost of $12.00 per set of six plates. This same firm can also do the printing of them if desired and also furnish placards of the General Regulations referred to in the book.

Fundamentals of Highway Traffic Regulation

PART I

GENERAL HIGHWAY TRAFFIC REGULATION

Law, Education, Enforcement
The A. B. C. of Traffic

DIVISION A

LAW

Suggested Standardized Enabling Ordinance Which it is Hoped Will be Developed Later Into a Standardized State or a Federal Law

Much of our trouble in standardizing traffic regulation has come from conflicting provisions set forth in a mass of all embracing city ordinances, state laws and motor vehicle acts framed by insufficiently experienced officials or committees. Traffic can not be controlled effectively by a fixed set of elaborate rules, for as knowledge acquired through application increases, an improvement may suggest itself that may be directly contrary to some already existing legal provision. Then comes the tedious task of amendment and the temptation to tinker.

It seems, therefore, the part of wisdom for cities and towns to adopt an enabling ordinance allowing flexibility in dealing with conditions that are not fundamental, but which clearly defines those long experience has demonstrated are basic.

The proposed enabling ordinance does not go into unnecessary detail nor is it intended to replace any existing motor vehicle act; rather it is set forth as a foundation for standardization and should be an integral part of any revised or future motor vehicle act.

While this suggested legal instrument is framed in the form of an ordin-

ance and should be enacted as such by each city or town trying to improve its traffic conditions, it would be better later to put it in the form of a state law, or best of all in the form of a federal law. Such a law passed by the Federal Government would practically automatically become operative throughout the whole country. I refer you to the following letter from Charles Thaddeus Terry, deceased, formerly counsel for the A. A. A. and for the N. A. C. C.:

February 19, 1920.

My dear Mr. Eno: I have yours of the 18th inst. and hasten to reply to your inquiry. The statement which you make and which you propose to put in your book, The Science of Highway Traffic Regulation, published 1920, is correct and sound for the reason that the United States Government has superior jurisdiction over post-roads. Furthermore, a Federal Highway Traffic Act, such as you mention, would doubtless be so drawn, at least it could be so drawn as not to interfere with any police powers of any of the states, even though the roads affected were not, strictly speaking, post-roads.

With cordial personal regards and best wishes, I remain,

Very faithfully yours,

Chas. Thaddeus Terry.

The proposed Enabling Ordinance is as follows:

An Ordinance[1] for the Regulation of Highway Traffic in the City[2] of .....

Be it ordained by the city of.....:

—That when used in this ordinance:

(a) The term "mayor" means the Mayor of the city of.....;

(b) The term "GENERAL TRAFFIC REGULATIONS" means the C.N.D. (Council of National Defense) Code which is now officially designated as "The General Highway Traffic Regulations for Vehicles with Safety Rules for Pedestrians,"[3] and which was adopted for standardization as a police code by the

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[1] Some cities already have ordinances or provisions of their charters sufficient to empower their mayors or police heads to regulate traffic. New York has been doing this since Oct. 30, 1903. However, an enabling ordinance such as here given would be far more satisfactory.

[2] Certain changes in terminology are necessary for some municipalities to adapt the ordinance to meet local conditions; such as the substitution of "town" or "village" or "borough" for "city" and of "village president" or "burgess" for "mayor". In commission-manager cities, it may be deemed advisable to give to the city manager, rather than to the mayor, the chief responsibility for traffic control. In all municipalities care should be taken that the enabling ordinance does not conflict with state laws. The writer, however, knows of no state law with which it does conflict.

[3] These general regulations, as revised to January 1, 1926, are printed in Division B of this chapter.

Council of National Defense, May 8, 1919, and has been revised to January 1, 1926:

(c) The term *"special traffic regulations"* means those regulations which, in addition to the general regulations, are intended to facilitate and expedite the safe movement of vehicles and pedestrians on the highways by the use of traffic officers and traffic guides;

(d) The term "traffic guides" means signs, limit or dividing lines, standards, "mushrooms" or "turtle-backs," "dummy cops," traffic "beacons" and "lighthouses," semaphores, "crowsnests," traffic regulation lights,[1] reflecting signals, sirens and such other devices as may be of assistance in the regulation of vehicular or pedestrian traffic.

Section 1.—That the Mayor, acting through the Police Department, of the city of .....is authorized and directed to adopt and enforce the GENERAL[2] TRAFFIC REGULATIONS (with duly authorized revisions from time to time) and to cause them to be printed in a six-page[3]

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[1] Care should be exercised against the installation of lights to regulate traffic by the block system extending over more than one intersection at a time. New York's experiments and more lately, those of other cities, in this direction are a sufficient argument for delay on adoption.

[2] On account of the confusion in the minds of the public arising over the terms "GENERAL HIGHWAY TRAFFIC REGULATIONS" and *"Special Highway Traffic Regulations,"* throughout the text of this ordinance, to emphasize the difference, the former has been put in CAPS and the latter in *italics.*

[3] Heretofore, the General Regulations (except those for Paris which are in an eight-page folder designed to fit their little license books) have been contained in four pages. They are now designed for six pages in order to use larger type.

Page 1 is devoted to Definitions.

Pages 2, 3 and 4 are devoted to Regulations for Vehicles—the time honored Rules of the Road revised.

Page 5 is devoted to Restrictions in Regard to Vehicles and Control, Treatment and Condition of Horses taken from different State Laws and City Ordinances and put in concise form.

Page 6 is devoted to Safety Rules for Pedestrians.

In this Code the word "regulations" is applied to vehicles, the word "rules" to pedestrians. A regulation is a law to be obeyed—a rule is a method of procedure to be followed; there is quite a difference in meaning and application. The word "rules" is adopted for pedestrians because if we were to make regulations sufficiently strict for all times for pedestrians, they would very often be unreasonable. As an instance of this I give the following: Suppose there was a regulation that pedestrians should cross only at crosswalks and a person left his house to mail a letter at two o'clock in the morning at a letter-box directly across the street and that the crosswalk was at the corner 150 feet from his house. Would that person go to the corner, cross the street at the crosswalk there, walk down to the letter-box, post the letter, walk back to the corner, cross the street at the crosswalk and then return to his house? If he did this, he would have walked in all 600 feet further than if he had gone directly across the street. It will be readily seen that any such regulation would be ridiculous, but a rule is different and can be reasonably applied in the case of pedestrians.

The Century Dictionary gives the following definition: Rule: A formula to which conduct must be conformed; a minor law, canon or regulation, *especially a regulation which a person imposes upon himself.*

folder with pages 4 by 6 inches, on durable, bright yellow paper, and also on a heavy yellow cardboard placard, setting forth all the provisions of the GENERAL TRAFFIC REGULATIONS **(AND SHOULD CONTAIN NO OTHER PRINTED MATTER).**

Sec. 2.—That the Mayor shall provide that each uniformed member of the.....police force shall, when going on duty, have in his possession a sufficient number of copies of the GENERAL TRAFFIC REGULATIONS, in folder form, to hand one of such copies to any person violating any provision of the general traffic regulations, marking on such copy the provision violated.

Sec. 3.—That the Mayor shall make effective arrangements for furnishing copies of the GENERAL TRAFFIC REGULATIONS to any person on application to the Police Department and for furnishing copies of such regulations to every pupil and teacher in the public schools of the city of.....

Sec. 4.—That the Mayor shall cause copies of the GENERAL TRAFFIC REGULATIONS in placard form to be displayed at police headquarters, fire stations, public schools and garages, gasoline stations, at other available public buildings, on standards on the highways, and in squares and parks, in such manner as to inform the public, including pedestrians, of the provisions of the regulations.[1]

Sec. 5.—That the Mayor shall order the School Board of the City of .....to make arrangements necessary to instruct the pupils of the public schools in the provisions of the GENERAL TRAFFIC REGULATIONS and for conducting such frequent examinations and drills as will cause such pupils to become thoroughly familiar with the provisions thereof.

Sec. 6.—That the Mayor may in his discretion cause to be compiled, printed and issued a small pamphlet on Traffic Information for the convenience of Drivers and Pedestrians, setting forth the penalties provided for infraction of GENERAL and *Special Traffic Regulations,* the state and local laws governing speed, lights, sound signals, and other equipment, special regulation as regards ranking and parking of dead or of live vehicles and any other information which may be useful in facilitating and safeguarding vehicular or pedestrian traffic.

Sec. 7.—That the Mayor shall cause to be issued to the members of the police force the following general order:

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[1] For out of door placards the best way is to use metal frames mounted on standards with glass on both sides—one side for the placards and the other for special traffic notices as required from time to time, as for instance, to call attention to any section of the regulations which is not being carefully observed or which needs explanation, etc.

"You are hereby informed that it is the duty of every uniformed member of the police force to correct and instruct drivers and pedestrians in the traffic regulations and reprimand them for infractions thereof; and if an offense is committed with obvious intent to obstruct traffic or to interfere with the rights or safety of others, to take the driver's name, number and address, the vehicle number, if it has one, or in the case of a pedestrian, his name and address and such other particulars as may be available for identification of persons or vehicles, and report same to the Traffic Bureau or to police headquarters for action. In case of a serious or intentional offense, the offender should forthwith be arrested."

Sec. 8.—That the Mayor shall see to it that traffic policemen shall use a uniform code of signals at crossings, so as to avoid confusing drivers and pedestrians, and may establish and maintain a traffic school for general and special traffic education.

Sec. 9.—That the Mayor may, in his discretion, from time to time, send one or more police officers to other cities to study traffic work in order to keep abreast of all improvements.

Sec. 10.—That the Mayor is authorized to create a branch of the Police Department to be known as the Traffic Bureau, which shall be in charge of a special police officer with the rank of inspector who shall be known as the Traffic Director of the city of.....and who shall not be under the orders of, or responsible to, any officer below the rank of Chief of Police. All members of such Traffic Bureau, or other members of the police force when detailed for traffic duty, shall be under the control and direction of the Traffic Director. The Traffic Bureau shall have control, subject to the approval of the Mayor, of enforcing traffic regulations for vehicles and teaching of safety rules to pedestrians on the highways, and shall keep a record of accidents for the purpose of fixing blame and ascertaining cause, with a view to devising prevention.

Sec. 11.—That the Mayor may provide the Traffic Director or his assistants when on duty, with motor cars or motorcycles in practical working order.

Sec. 12.—That the Mayor is authorized and directed to appoint a civil engineer who has specialized in highway traffic regulation and requirements, to be known as the Traffic Engineer of the city of..... and who shall not be under the orders of, or responsible to, anyone except the Mayor. Such Traffic Engineer shall have full power to decide upon all special regulations and traffic systems, plans or guides and when or where they shall be employed, including the planning, marking out and defining of crosswalks, safety, prohibited, restricted and danger zones and the laying out of limit lines

and such other matters as may properly come under his supervision. It shall also be the duty of the Traffic Engineer to advise the Mayor as to what action should, in his opinion, be taken in regard to such matters as needed alterations in curb lines or car tracks, the removal of anything within or outside the boundaries of a roadway which prevents the best use of the highway or which seriously obstructs a view of traffic and any other matter which may affect the regulation of traffic.[1]

Sec. 13.—That the Mayor shall forthwith and hereafter from time to time cause to be prepared from the best information available an itemized estimate of expenses necessary to furnish the city of.....with effective and up-to-date traffic regulation.

Sec. 14.—That in case any provision of the GENERAL or any *special* police regulations in regard to traffic is violated, the persons so violating or disobeying said provision shall pay such fine or suffer such punishment as may be prescribed at the time of such violation by the ordinances of the city of..... .....or the laws of the state of.....

Sec. 15.—Any provision of any existing ordinance with conflicts with this ordinance is hereby repealed.

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[1] In Sec. 10, the Mayor is authorized to appoint a Traffic Director. In Sec. 12, the Mayor is authorized to appoint a Traffic Engineer. The Traffic Director, a member of the municipal police force, should have as his part, all police duties in regard to the handling of traffic while the Traffic Engineer should have as his part all engineering problems for traffic to work out to be put in operation by the Traffic Inspector, as well as the making of any special regulations.

Notice that the appointment of the Traffic Director is made by the mayor acting through the Police Department. Therefore the said Director would be directly under the authority of the Chief of Police who in turn is under the authority of the Mayor. The Traffic Engineer however is a direct appointment by the Mayor and he is not under anyone's orders but those of the Mayor. If, therefore, any question of authority arises between the Police Department and the Traffic Engineer, it is the duty of the Mayor to settle it.

Whether the actual marking of lines and the placing of other traffic guides shall be done through the Police Department or through the office of the Traffic Engineer is a question for the Mayor to decide, but of course the superintending of the marking of lines and the placing of other traffic guides should be done under the direction of the Traffic Engineer.

In addition to these two departments, every city which has not done so, should employ a city planner with an appropriate force to make a complete survey of the city so as to anticipate the traffic requirements of the future as well as those of zoning and other activities, not only for traffic facilitation but for the beautification, health and welfare of the city. A traffic survey, kept up to date, is a necessity for every city in order to avoid costly mistakes brought about through carelessness or thoughtlessness and its personnel should be appointed immediately and activities kept in operation permanently.

DIVISION B

EDUCATION

The Council of National Defense Code of General Highway Traffic Regulations

General Highway Traffic Regulations are those which are ample for the largest city and not superfluous for the smallest village. They are, in fact, the ancient "Rules of the Road" developed for modern requirements. The history of their development has been as follows:

Before 1903, there was practically no attempt made to regulate traffic anywhere, except in British cities, but even these had not, and London, at least, still has not a set of printed general highway traffic regulations. In these cities, however, traffic was well controlled, due to the fact that both drivers and pedestrians for generations, had known and obeyed without question the time-honored rules of the road and the police were well trained.

It was realized that we could not wait as England had, for the traditions of generations to control traffic, so the only thing to do was to hasten the education of the public by printed general regulations—short, concise and reasonable—amply distributed in folder form and posted in placard form for the information of pedestrians.

An active campaign in New York was begun in January, 1900, but it was not until October 30, 1903, that the printed regulations were officially adopted by the police department. The improvement in traffic conditions was immediate.

The General Regulations were revised in 1908, 1909, 1910, 1914 and 1915, and brought up to date in 1919 by the Highways Transport Committee of the Council of National Defense. When the Council of National Defense ceased to exist, these regulations were handed by legislation over to the United States Department of Agriculture and lodged with the Bureau of Public Roads. Subsequently they were referred to the Highway Education Board, a semi-official, co-ordinating organization, on which the Bureau of Public Roads is represented by the Chief of the Bureau. At a National Conference on Education for Highway Engineering and Highway Transport called at Washington by the Highway Education Board in October, 1922, a special committee on questions of teaching principles of highway traffic submitted the following recommendations. These were approved and adopted by the Conference:

> "The Committee believes that a study of the underlying principles of the best practice in relation to traffic regulation and safety is of fundamental importance. The Committee, therefore, recommends

that the Highway Education Board ask The Eno Foundation for Highway Traffic Regulation, Inc., to take up these problems as a continuation of the work of the Council of National Defense for the investigation, codification, publication and standardization of general highway traffic regulations; thus insuring continuity and permanency in the study of these important problems.

Respectfully submitted,

H. J. Hughes, Chairman, Dean, School of Engineering, Harvard University;
John J. Tigert, United States Commissioner of Education;
Chas. J. Bennett, State Highway Commissioner of Connecticut;
George Diehl, President, American Automobile Association;
Stephen James, Highway Education Board, Washington, D. C.;
H. S. Jordan, National Automobile Chamber of Commerce;
William Phelps Eno, Chairman, Board of Directors, Eno Foundation for Highway Traffic Regulation, Inc.;
Pyke Johnson, Secretary, Highways Committee, N. A. C. C.;
John C. Long, Educational Secretary, N. A. C. C.;
E. A. Baughman, Commissioner of Motor Vehicles, Baltimore, Md.;
Dr. James W. Inches, Commissioner of Police, Detroit, Mich.;
George M. Graham, Vice-President, Chandler Motor Car Co.;
William E. Metzger, President, Columbia Motor Car Co.;
L. V. Coleman, Director, Safety Institute of America;
W. H. Cameron, Executive Secretary, National Safety Council;
Dr. W. M. Marston, Professor of Psychology, American University;
James Madden, North Jersey Auto Club;
Professor C. J. Tilden, Chairman, Division of Engineering, Yale University;
Dean J. W. Votey, University of Vermont;
J. C. Mills, The Steffenguide Co., Columbus, Ohio;
C. B. Buck, Chief Engineer, Delaware State Highway Department."

The General Regulations are now under the following caption: "General Highway Traffic Regulations for Vehicles with Safety Rules for Pedestrians, adopted for standardization as a Police Code by the Council of National Defense, May 8, 1919, Revised to January 1, 1926."

No general highway traffic regulations have been issued in this country or elsewhere which have not had the New York regulations as their ancestor, but unfortunately, committees or police officials have been allowed to tinker with them so that, with few exceptions, the regulations are in complicated form, much too long, often unreasonable, and lacking in clearness. The General Highway Traffic Regulations for Vehicles with Safety Rules for Pedestrians as revised to January 1, 1926, should be standardized throughout the country and protected against unauthorized local changes by provision for

such periodical improvement as may be found necessary. This is the only way by which uniform general traffic regulations can be obtained and maintained.

General highway traffic regulations, to be effective, must be short or they will not be read, clear or they will not be understood, reasonable or they will not be obeyed. Failure to make them short, clear and reasonable[1] has so often made traffic regulation abortive that it is time to have them standardized and beyond the meddling hands of inexperienced officials and committees.

The General Highway Traffic Regulations for Vehicles with Safety Rules for Pedestrians should be put into effect everywhere without immediate change but with provision for the consideration of suggested improvements at meetings to be called when necessity arises. The regulations as they stand, revised to January 1, 1926, have been worked over by dozens of committees and hundreds of individuals during more than twenty-five years and no hurried further revision should be attempted as it would simply create delay and cause confusion. The plan of getting advice and suggestions on them which was successfully carried out by the Highways Transport Committee of the Council of National Defense in 1918-9 should be again followed before meetings for revision are called.

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1 The length and complexity of regulations issued in many of our cities have tended to retard the education of both drivers and pedestrians in the regulations which they are expected to follow. One of our cities, and perhaps the one which should set the example, above all others, has adopted a set of regulations which are printed in a pamphlet containing about thirteen thousand words in small print. Surely only a very few people will read these and even if most of them could be induced to do so they would not be able to understand them.

EDUCATION IS THE KEY TO REGULATION

GENERAL HIGHWAY TRAFFIC REGULATIONS FOR VEHICLES WITH SAFETY RULES FOR PEDESTRIANS

ADOPTED FOR STANDARDIZATION AS A POLICE CODE BY THE COUNCIL OF NATIONAL DEFENSE MAY 8, 1919, REVISED TO JANUARY 1, 1926

ISSUED BY THE

MAYOR OF SPACE LEFT FOR NAME OF CITY

DEFINITIONS.

HIGHWAY—any Street or Road used as a public thoroughfare.

ROADWAY—that part of a highway or park for the use of vehicles.

SIDEWALK—that part of a highway or park for the use of pedestrians.

CROSSWALK—that part of a roadway, marked or understood, upon which pedestrians should cross.

SAFETY ZONE—that part of a roadway from which all vehicles are excluded.

READ CAREFULLY

PROHIBITED ZONE—that part of a roadway from which pedestrians and all vehicles, except street cars, are excluded.

RESTRICTED ZONE—that part of a roadway on which pedestrians are allowed but from which all vehicles except street cars are excluded.

DANGER ZONE—any part of a roadway not a safety zone or a cross walk.

TRAFFIC WHIRLPOOL—that part of a roadway bounded by curbs and crosswalks where rotary traffic is in effect.

UNDERSTAND FULLY

CURB—the edge of a roadway, marked or understood.

LIMIT LINES—boundaries of ranking or parking areas, safety, prohibited, restricted, or danger zones, crosswalks, etc.

VEHICLE—any conveyance, including a horse. Hand or foot-propelled conveyances and skaters are regarded as vehicles when on a roadway but as pedestrians when on a sidewalk, crosswalk, or safety zone.

STREET CAR—any public service vehicle confined to rails on roadway.

LIVE VEHICLE—one whose driver is present, and prepared to move vehicle.

DEAD VEHICLE—one whose driver is absent or unable to move vehicle.

HORSE—any saddle or harness animal.

DRIVER—any person in control of a vehicle.

ONE-WAY TRAFFIC—traffic restricted to one direction.

TO RANK—to stand vehicles (one behind the other) parallel to curb.

TO PARK—to stand vehicles (parallel to one another) at an angle to curb.

SAFETY FIRST, LAST AND ALWAYS

THE POLICE ARE THE OFFICIAL REGULATORS

The following General Regulations for vehicles (including street cars in so far as their being on rails will permit) *shall be observed by their drivers* who shall *promptly comply* with all police orders given by voice, hand or whistle, semaphore or signal light, as to starting, stopping, slowing, approaching or departing from any place, the manner of taking up or setting down passengers and the loading or unloading of anything.

Vehicular or pedestrian traffic may be halted or diverted by the police to avoid congestion or to promote safety and convenience.

GENERAL HIGHWAY TRAFFIC REGULATIONS FOR VEHICLES

ARTICLE I. RECKLESS DRIVING IS UNLAWFUL AND INCLUDES:

SECTION 1. Driving any vehicle when not legally qualified to do so, or when intoxicated, or when for any other reason not competent to drive properly.

SEC. 2. Driving any vehicle when it is not under practical control, ***especially at crosswalks and roadway intersections or junctions.***

SEC. 3. Failing to exercise due care in crossing or entering the traffic of another roadway—***bearing in mind that it is obligatory not to interrupt the traffic of the more important thoroughfare unnecessarily.***

SEC. 4. Exceeding a reasonable, considerate and safe speed rate under existing conditions or the speed rate established by law.

SEC. 5. Violating any of the following Regulations so as to cause danger or failing to take ***every reasonable precaution*** for safety or to obey any order of a traffic officer or any direction indicated by official traffic sign, semaphore, signal light or limit line.

ART. II. PASSING, TURNING, AND KEEPING NEAR CURB

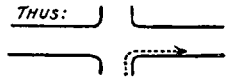
SECTION 1. A vehicle passing or being passed by another shall not occupy more than ***its fair share*** of the roadway.

SEC. 2. A vehicle meeting another shall pass to the right.

SEC. 3. A vehicle overtaking another shall pass to the left, but must not interfere with traffic from the opposite direction, nor pull over to the right before entirely clear of the overtaken vehicle—but in overtaking a street car, pass to the right, except in an emergency, pass to the left, with ***due caution after observing traffic from opposite direction.***

SEC. 4. A vehicle turning into a roadway to the right shall keep close to the right-hand curb,

THUS:

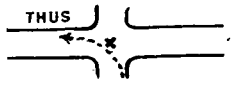


TURN SLOWLY AND CAREFULLY — CARE AT CROSSWALKS — SLOW AT INTERSECTIONS — KEEP NEAR RIGHT-HAND CURB

EXTRA CARE ON SLIPPERY PAVEMENT

SEC. 5. A vehicle turning into a roadway to the left shall pass around the central point of intersection of the two roadways,

except when directed by the traffic officer to pass in front of the central point of intersection, or when its turning radius will not permit its passing around the central point of intersection without backing, it may pass in front of it, ***provided it slows down or stops and signals effectively,***



SEC. 6. A slow moving vehicle shall keep as near as practicable to the right hand curb—***the slower the speed the nearer the curb.***

SEC. 7. A vehicle loitering or cruising for fares shall proceed fast enough ***not to impede following traffic.***

SEC. 8. A vehicle on a roadway divided longitudinally by a parkway, walk, sunkenway, viaduct, safety zone, or cab stand, shall keep to the right of such division.

SEC. 9. A vehicle passing around a circle, oval or other form of centralized obstruction, shall keep to the right of such obstruction.

SEC. 10. A vehicle shall give ***ample room*** to bicyclists and skaters and pass them with care.

ART III. RANKING, PARKING, STOPPING, FOLLOWING, BACKING

ALL VEHICLES

SECTION 1. A ***live*** or a ***dead*** vehicle may be ranked or parked on any roadway and for any length of time, provided it does not interfere with the ***rights of others,*** and subject to the following sections of this Article, unless prohibited from so doing or limited as to time by an official traffic sign or special regulation.

SEC. 2. A vehicle shall not be stopped on a crosswalk, nor within an intersection, except in an emergency, nor left standing within ten feet of a fire hydrant, nor with any part of its load extending beyond limit lines.

SEC. 3. If ranking stalls are marked, any vehicle occupying one of them shall stop with the center of its front wheels on the ***front line*** of the ranking stall.

SEC. 4. If parking stalls are marked, any vehicle occupying one of them shall stop ***entirely within it.***

SEC. 5. A vehicle on a two-way traffic roadway shall stop at the right hand curb only, but not at all if preventing other vehicles from passing in ***both directions*** at the same time.

SEC. 6. A vehicle on a one-way traffic roadway may stop at either curb, but not at all if preventing other vehicles from passing in one direction.

SEC. 7. A four-wheeled, horse-drawn vehicle backed up to the curb shall have its horses stand parallel to the curb, faced with the direction of traffic.

COOPERATION IS NECESSARY FOR RESULTS

DEAD VEHICLES

SEC. 8. A ***dead*** vehicle shall not be left on a congested roadway during crowded hours except on an indicated public ranking or parking space, subject to local police traffic signs, nor shall it be left in such a position as to prevent other ranked or parked vehicles from moving away nor so as to obstruct moving traffic.

LIVE VEHICLES

SEC. 9. A vehicle stopped in front of an entrance to a building or transportation station, unless it be expeditiously loading or unloading, shall promptly ***give place to an arriving vehicle.***

SEC. 10. A vehicle shall not follow another ***too closely for safety,*** nor follow fire apparatus, going to a fire, closer than 500 feet.

SEC. 11. A street car shall not be stopped nearer to another street car ahead than five (5) feet.

SEC. 12. A vehicle shall not back to make a turn or in any way so occupy a roadway as to obstruct traffic.

ART. IV. OVERTAKING STREET CARS.

A vehicle overtaking a street car, stopped or stopping to take up or set down passengers, shall ***stop*** or ***pass very slowly,*** carefully and considerately, not approaching said car nearer than eight (8) feet (the width of a street car).

ART. V. RIGHT OF WAY FOR CERTAIN VEHICLES.

SECTION 1. A vehicle ***shall give*** the right of way to any other vehicle approaching from its right and to all vehicles of the police, water and health departments, public service emergency repair vehicles and ambulances approaching from any direction, ***but this shall not relieve any approaching vehicle from consequences of carelessness.*** (See Article I, Sections 2, 3 and 4.)

SEC. 2. A vehicle, on the approach of fire apparatus, shall ***move out of its way*** or stop so as not to interfere with its passage.

SEC. 3. A vehicle in front of a street car, upon signal, shall immediately ***get off the track.***

ART. VI. SIGNALS.

SECTION 1. Drivers must signal by hand or by some other effective method ***before*** starting, slowing, stopping or backing, and ***before*** turning, ***especially to the left.***

SEC. 2.Drivers when approaching or entering a curve, highway intersection or junction or coming to the top of a hill, ***if roadway is obscured,*** must use sound signal effectively and go slow.

SEC 3. Drivers when ***crossing a crosswalk must go slow,*** take care, and signal when necessary to insure safety.

SEC. 4. Police whistle signals mean:

One Blast—that approaching traffic shall stop ***behind*** crosswalks.

Two Blasts—that halted traffic shall proceed ***with due care for pedestrians.***

Three or more Blasts—approach of fire apparatus or other danger.

SEC. 5. Vehicles must be equipped with lights, mirrors and sound signals as prescribed by law, but sound signals shall not be used except for necessary traffic warning. ***A moderate speed will reduce need for noisy signals.***

ACCEPT RIGHT OF WAY

GIVE SIGNALS CLEARLY AND IN TIME

NEVER ASSUME IT

BE SURE SIGNALS ARE UNDERSTOOD

CARE—NOT NOISE—SPELLS SAFETY

ABOVE ALL USE COMMON SENSE AND CARE

OBSERVE RESTRICTIONS FULLY

HAVE DUE REGARD FOR SAFETY

AVOID DANGERS

BE CONSIDERATE

ART. VII. RESTRICTIONS IN REGARD TO VEHICLES.

SECTION 1. A vehicle shall not be used when it is so constructed, enclosed, equipped or loaded as to be ***dangerous*** or ***noisy,*** to scatter its contents, retard traffic, or prevent the driver from having a ***view sufficient for safety;*** or when it is so loaded with iron or other material as to create load noises while in transit, or when it is loaded with any material extending beyond its rear without being provided with a ***red flag*** by day and a ***red light*** at night on the rear end of the load.

SEC. 2. A vehicle unless confined to rails shall not tow more than one other vehicle without authorization by law or official permit, and the tow connection shall not be more than sixteen feet in length, and shall have a white flag attached to its center.

SEC. 3. A dead vehicle shall not be left in such a condition as to prevent its being moved ***out of the way in case of emergency,*** and if motor propelled it shall have its motor stopped and effectively secured against being started, its emergency brake set, and, if on a hill, its front wheels turned in the direction of the curb.

SEC. 4. A vehicle intended for commercial purposes shall not be driven by anyone less than sixteen years of age.

SEC. 5. No one shall hitch or hold on to any vehicle.

SEC. 6. No one shall ride upon the rear of a vehicle without the driver's consent.

SEC. 7. Coasting is prohibited where dangerous.

SEC. 8. Opening a motor muffler cut-out on a highway within a city or village, or in the country within 500 feet of a dwelling, school, church or hospital is prohibited.

SEC. 9. Dense smoke from motors is prohibited.

ART. VIII. CONTROL, TREATMENT AND CONDITION OF HORSES.

SECTION 1. A horse shall not be unbridled nor left unattended on a highway or in an unenclosed area, without being safely fastened, unless harnessed to a vehicle with wheels so secured as to prevent the horse from moving faster than a walk.

SEC. 2. No one shall ride, drive or lead a horse on a slippery pavement, unless the horse is properly shod to prevent falling; over-load, over-drive, over-ride, ill-treat or unnecessarily whip any horse; crack or so use a whip as to excite any other person's horse, or so as to annoy, interfere with or endanger any person; or use a horse unless fit for its work, free from lameness or sores likely to cause pain, and without any vice or disease likely to cause accident, injury or infection.

SEC. 3. A horse, especially if he be led or ridden, shall be approached slowly and with extreme care and consideration, particularly by motor vehicles, and if the horse is frightened or unmanageable the motor vehicle and its engine shall be ***stopped until the danger is passed.*** Care shall also be taken ***not to sound horn or open cut-out*** when close behind a horse.

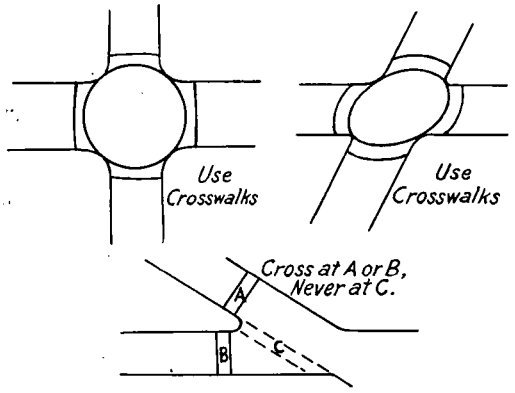
MOTORISTS MUST BE FAIR TO HORSES

STOP — LOOK — LISTEN

SAFETY RULES FOR PEDESTRIANS

The following Rules should be observed by pedestrians to insure safety and to avoid unnecessary interference with vehicular traffic:

1. Keep to the right on sidewalk, crosswalk, roadway and passageway (but on highway without sidewalk, keep to left, so as to have clear view of approaching traffic).
2. Observe traffice before stepping from curb and keep off roadway except when crossing.
3. Cross roadway if reasonably possible on a crosswalk if lined off but if not lined off keep well back from intersection so as to have timely view of vehicles turning into the roadway you are crossing. See diagrams.



COMMIT TO MEMORY

LIVES DEPEND ON IT

4. Keep out of traffic whirlpools, except to cross them on crosswalks marked with signs and limit lines.
5. Watch for traffic officer's signal and heed traffic signs and limit lines.
6. Stand on sidewalk or within safety zone while waiting for a street car or bus.
7. Face and step towards front of street car when alighting.
8. When necessary to pass behind a street car or other vehicle, watch out for approaching traffic.
9. On alighting from a street car or other vehicle, observe traffic before moving.
10. Enter and leave car-stop safety zone at crosswalk only.
11. Do not stand in the middle of a sidewalk but on one side and out of the way of other persons.
12. Do not loiter on a crosswalk or before a public entrance.
13. When sidewalks are narrow use the one on the right.
14. Do not walk more than two abreast on a crosswalk or congested sidewalk, nor more than three abreast on any part of any highway.
15. Hand or foot propelled conveyances and skaters ***when on roadway*** must observe the **GENERAL REGULATIONS FOR VEHICLES**; but when on ***safety zone, sidewalk or crosswalk,*** they must observe the **SAFETY RULES FOR PEDESTRIANS.**

SPECIAL VIGILANCE AT NIGHT

DIVISION C

ENFORCEMENT

The Role of the Police in Traffic Management

(a) Traffic Branch of a Police Department

The General Highway Traffic Regulations for Vehicles with Safety Rules for Pedestrians have been reproduced and discussed in the preceding division, and now the question of the means of enforcement must be considered. In so far as is conceivably possible, the drivers themselves should be the enforcers of the regulations and should feel the responsibility for their proper execution. The rôle of the policeman should be that of overseer. This is in accord with what experience has revealed in London, where the drivers themselves have proved the best regulators of traffic, because, knowing their duties as well as their rights, they strictly observe the former and resent interference with the latter by others, who are not excused for ignorance. It becomes, therefore, of the first importance to educate the drivers so as to make them, as well as the police, the regulators of traffic.

In the United States, unfortunately, there is not the inborn respect for law which is found in England. Violations of the laws of the land are frequent and there is a regrettably widespread impression that the law is to be obeyed only under compulsion. Another reason for lawlessness is that justice is slow and uncertain and offenders are too often treated laxly. Stricter and more sure punishments, combined with a building up of the morale of the people through channels of education should tend to remedy the prevalent disrespect of the law.

It is therefore fitting that we state the following fourfold classification of drivers we have to deal with:

First: Those who *know* the regulations and are willing to obey them.

Second: Those who *do not know* the regulations but who would be disposed to obey them if they did.

Third: Those who *know* the regulations but are not disposed to obey them.

Fourth: Those who *do not know* the regulations and would not be disposed to obey them under any circumstances.

The first class in this country is, unfortunately, too small and it is clear that it needs regulating least of all.

The second class is many times larger than all the others together, but if by education we can add this to the first, most of the difficulty will be overcome.

The third class is, fortunately, very small and can be made to obey by force when necessary, but the experience of other countries teaches us that those who

compose this class are usually impelled to obey by the demands of those law-observing drivers who resent having their own rights interfered with and by gradual realization of the advantages to all, individually.

The fourth class, much larger than the third, can by education be added to the third class and in time almost eliminated.

Thus we are able practically to reduce these four classes to two, as follows:

First: Those *who know* the regulations and *are willing to obey them.*

Second: Those *who know* the regulations but *are too selfish, vicious, or ignorant to see the advantage of obeying them.*

This second class, like the poor, we shall always have with us to some extent, and for it, the only remedy is prompt punishment; but this class will diminish very rapidly through proper handling.

It is a self-evident fact that as the number of those who become familiar with the traffic regulations increases, the less will be the work required to be done by the police. In other words, pennies spent on education will save dollars for enforcement. Common sense methods are so easy, economical, efficient and comprehensive that there is no apparent reason why they should not be everywhere employed.

> Education of the drivers as to their duties and rights is, really, the keynote to efficient and economical street traffic regulation, and anyone in charge of street traffic can be nothing but a stumbling block to its development and proper control unless he sees the importance of this fact and acts upon it.

At the risk of repeating myself I dwell on this matter of education! It is all-important! Unless my reader can see this point, it will be a waste of time for him to read this book.

If we observe the conditions in other countries we find that traffic moves more smoothly in England than elsewhere. The uninitiated attribute the smoothness entirely to the police, and to the fact that drivers there are amenable to authority. Much of this is the case because the police are thoroughly trained in their duties and the drivers who see the advantage of it, follow directions; but back of this is the still more important fact that the English are, and have been for generations, a nation of horsemen. It is the exception and not the rule to find an Englishman who does not know how to drive and who does not understand and observe the rules and etiquette of the road. The English, as a rule, are also fond of fair play, and not only give it but demand it from others—they know their duties and perform them but at the same time vigorously resent having their rights interfered with by careless, ignorant or perverse drivers. If we

add to this the fact that the English are a nation of "kickers" we will have found a full explanation of the orderly movement of traffic.

A short time spent driving around London will convince anyone who observes that the drivers themselves are the real regulators of street traffic under ordinary conditions. The presence of the police is needed, principally, at the intersections of crowded thoroughfares, to give the signals for alternately stopping and starting the lines of traffic in crosswise directions.

Now let us pass to the consideration of the rôle of the police in traffic regulation.

As so many of our roads are Federal roads, it may be that there will be in the future Federal Police to regulate the traffic on them. Already many of our States have State Police, a portion of whose duties is the regulation of traffic. We have had and always shall have city police. Probably sometime all three kinds of police will work in harmony in a well-thought-out scheme of cooperation in the management of traffic.

In London and Paris, the Police Departments[1] have branches known as the Public Carriage Office in the one and as Le Bureau des Voitures Publiques in the other, some of the duties of which are to examine and license drivers of public vehicles, such as cabs, trucks, sight-seeing cars, etc., and to make and enforce regulations in regard to the fitness and maintenance of such vehicles, including examination of taximeters, etc.

Every city should have a similar branch of its Police Department, to be appropriately known as the Traffic Bureau of the Police Department. The Traffic Bureau should have authority over all matters pertaining to the carrying out of the regulation of traffic on the highways. Two particularly important functions are the control of traffic on the streets by the Traffic Squad (see (b), p. 20), and the appropriate jurisdiction in the case of violation of the regulations through the medium of Traffic Courts or Traffic Arbitrators (see (d), p. 23).

Other duties of the Traffic Bureau are as follows: The licensing of peddlers and the registration of push-carts and regulations in regard thereto; control of obstructions on roadways and sidewalks, including those necessitated by building operations when these affect the movement of traffic; the recording of accidents for the purpose of fixing blame and ascertaining cause with a view to devising prevention.

The head of the Traffic Bureau should be fitted by special talent as well as by experience for traffic work. The money-saving which a competent man at the head of the Traffic Bureau can effect for any city is very large, not to mention the saving of life and the reduction in the number of accidents. Even in towns

1 Many of our cities are now following the example of Paris and London.

with but a small police force, the supervision of traffic work should be delegated to a special officer who should not be outranked by any uniformed officer except the Chief of Police.

Street Traffic Regulation has long since become the most important branch of police work, from an economic standpoint at least. Even in its present incomplete development the amount of money it saves the people of New York, for instance, very many times exceeds the cost of maintenance of the entire department.

(b) Police Duties in Regulating Traffic

The Traffic Squad

All policemen should be made to understand by the following general order from headquarters that they have general traffic obligations:

> "You are hereby informed that it is the duty of every uniformed member of the police force to correct and instruct drivers and pedestrians in the traffic regulations and rules and reprimand them for infractions thereof, and if an offense is committed with obvious intent to obstruct traffic or to interfere with the rights or safety of others, to take the driver's name, number and address, the vehicle number, if it has one, or in the case of a pedestrian, his name and address, and such other particulars as may be available for identification of persons or vehicles, and report same at his precinct station or at Police Headquarters for action. In case of a serious or intentional offense, the offender should forthwith be arrested."

In addition to the general traffic duties to be performed by all members of the police force, there are special duties which require a trained body of men—a traffic squad. The traffic squad consists properly of members of the Traffic Bureau who perform traffic regulation work on the highways.

All police privates and officers, including members of the office force, men on foot and those mounted on horses and wheels who are regularly employed in traffic work, should be members of the Traffic Bureau and directly under the Traffic Director. If details of men from the Traffic Squad are needed in emergency they should be assigned by the head of the Police Department through an order to the Traffic Director. It goes without saying that all members of the Traffic Squad should understand that they are not withdrawn from regular police duty but must be ready to help wherever and whenever occasion arises in the same way that all policemen have general traffic obligations as explained above.

The men on foot should regulate traffic at street intersections and other

congested points.[1] Where the Block System is in force such regulation consists principally in stopping and starting traffic on each street in turn; but everywhere, it should consist in facilitating drivers and pedestrians by direction with hand, voice or whistle when necessary. This can be done efficiently only by specially trained traffic men.

The mounted men should patrol and exercise general supervision over traffic. Being higher up, they can see better than men on foot and are most valuable in reprimanding drivers for offenses and in teaching them to observe the regulations. The horses, however, must be carefully trained for this work.

Mounted traffic men should not be on stationary duty at street intersections nor elsewhere, nor ordinarily on streets with car-tracks. It was the misuse of mounted men in New York that led to the mistaken idea that they were not needed for traffic work. This resulted in a reduction of their number and in sending most of them to the suburbs where, in fact, bicycle and motorcycle men are more efficient. Their proper function is patrol duty, especially on the river fronts and in parks and they should be used for this duty in sufficient number.

A well trained body of mounted police is essential to every large city for the management of parades, escort duty, suppression of riots, etc. A mounted traffic squad furnished this service economically, because daily traffic duty gives its members regular employment between times.

The bicycle men[2] should patrol and exercise general supervision of traffic, particularly in seeing to it that in crowded streets the parking and ranking privileges, especially of dead vehicles, are not abused and moving traffic obstructed. The flexibility and speed of bicycle men enable them to cover a large territory effectively. Motorcycle police are particularly useful in the suburbs and parks in regulating the speed of automobiles.

The management of traffic by the police adds comparatively little to the cost of police work, because the men composing the traffic squad are not withdrawn from regular police duty, but are usually so placed by their special assignments as to have an effective supervision of their locality and to be found readily in case of emergency. Their duty constitutes limited "fixed post duty" by men on foot and limited "patrol duty" by men on horses and cycles.

The Traffic Squad, on account of its greater experience, is very efficient in

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[1] An unskilled traffic policeman at a street intersection is a hindrance to and not an assistance in traffic regulation. It is far better to use a Dummy Cop or a traffic bumper unless a skilled man can be provided. Many of the men now on duty at intersections throughout the country should be given other jobs.

[2] Many more bicycle men could be used with advantage in every city to keep the streets open and clear for traffic. The general statement is true that in all cities more traffic men are used than necessary at intersections and not enough on patrol.

the management of vehicles at theaters and other places of assembly and at the races.

It is manifestly impossible to lay down, in a reasonably brief form, rules which should always be enforced to the letter, and consequently considerable discretion should be left to the intelligence of the traffic officers themselves.

Uniformity of signals at crossings is much to be desired and has at times been taught at Police Headquarters in New York with excellent results.

(c) Penalties

Section 16 of Division A of this chapter reads as follows:

> "That in case any provision of the general or special police regulations in regard to traffic is violated, the persons so violating or disobeying said provision shall pay such fine or suffer such punishment as may be prescribed at the time of such violation by the laws of the state of.....or ordinances of the city of....."

Fines and punishments now differ greatly in different cities and states and it is very doubtful if they ever can be standardized, although time and experience will doubtless lead to more uniformity than now exists. The proposed enabling ordinance is therefore left open for a list of such fines and punishments as are already locally in force in the city where the proposed enabling ordinance is to be in force. Section 7 of the proposed enabling ordinance (see p. 4), however, provides for a small pamphlet which should contain full information on penalties as well as other matters of interest to drivers and pedestrians. In the General Highway Traffic Regulations for Vehicles with Safety Rules for Pedestrians, on pp. 11 to 16, inclusive, no mention has been made of penalties, it being thought inadvisable to include these necessarily lengthy details as it is essential to make the contents of the folder as brief as possible.

Penalties should of course be in proportion to the gravity of the offense. Prison sentences are not desirable except in extreme cases. Reference to the driver's permit or license, if a proper form of permit or license is in use (see (e) p. 24), should indicate whether or not the driver has been arrested before.

Anyone who is a party to an accident and who tries to escape or hide his identity or the identity of his car deserves the most severe punishment.

Driving without permit or license should be dealt with by a heavy fine, for the first offense, increasing materially for repetitions. There are emergencies when it becomes necessary for someone to drive home or to a place

of safety who has no permit or license, as for instance, if the driver is taken ill and someone has to take his place. These circumstances should, of course, be given intelligent consideration.

If a driver should misplace or lose his permit or license, he should be obliged to produce it within a given time or show by proper evidence that he has duly qualified and has received it. The number of people, especially minors, now driving who have no permit nor license is very large and has doubtless been one of the greatest contributing factors in causing accidents. The police should receive strict orders to stop any car at any time and demand to see the permit or license to drive if they suspect that the driver has not qualified.

Another matter worthy of the constant vigilance of the police is the improper placing of the registration plate and its condition and lighting equipment. All drivers who are negligent in this matter should be stopped and fined adequately (see (e) p. 24).

Reckless driving[1] or violation of any other provision of the regulations should be punished in accordance with the gravity of the offense, increasing in severity for repetitions.

(d) Traffic Courts

It would be well for all of our cities to have one or more traffic courts, and they should be so conducted as to cause as little delay and trouble as possible. On this subject, Chapter III of Part 3 of the "Science of Highway Traffic Regulation" (1920) is here quoted:

> "On Page 3 of 'Street Traffic Regulation,' published as far back as 1909, there appears the following paragraph:
>
> 'It would still further tend to simplify and avoid trouble and waste of time if there were Street Traffic arbitrators at the Traffic Bureau and its branches, whose duties should be to examine all cases of street traffic accidents and breach of street traffic regulations, and decide what punishment should, in their opinion, be meted out or what damages should be paid. If the culprit chooses, he would, of course, have the right to resort to the courts, but in such cases the findings of the arbitrators should also be reported to the courts. Probably a large percentage of the traffic cases, by this method, would never go to the courts.' "

This paragraph together with later conversations on the subject, resulted in the first traffic court being established in New York City.

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[1] See Article I of the general regulations. Read all five sections carefully, especially Sections 2 and 3. All drivers who disregard these sections should be fined heavily each time they do so. Article I, if universally obeyed, would almost eliminate traffic accidents.

In large cities there is no doubt but that traffic courts should exist, and in a city like New York, a good many are necessary. In small cities and towns which have police departments, the suggested plan of Street Traffic Arbitrators might be ample for the purpose.

It should be borne in mind, however, that the education of the public in Traffic Regulation means reducing the necessity of traffic courts. The education of the public is so cheap and the upkeep of courts so expensive that all necessary money should be spent on the former in order to decrease large expenditures essential for the maintenance of the latter.

At each Traffic Bureau and at traffic courts, diagrams of typical and special traffic intersections and junctions should be provided, to be spread on a table for the purpose of simulating accidents. Toy vehicles or little blocks made on the same scale as the diagrams should represent the different kinds of vehicles to illustrate how accidents occurred.

(e) Licenses, Permits, Registrations and Vehicle Lights

It would, of course, be a nuisance measure as well as unnecessarily burdensome and expensive to require drivers who already have permits or licenses to drive, to pass a new examination. It would be practical and reasonable, when any driver of a motor vehicle, whether he has ever passed a driving test or not, is arrested for reckless driving or other disregard of traffic regulations, to oblige him to pass another examination as to his competency to continue to drive a motor vehicle so as to satisfy the authorities that he is a safe and proper person to drive on the public highways.

It surely is reasonable also that new permits or licenses for drivers of motor vehicles be granted only after official physical and mental examination, demonstration of thorough familiarity with the general traffic regulations, satisfactory references as to character and practical demonstration of ability to drive safely. I would advise that a difference be made between drivers of private vehicles and drivers of public vehicles; that the former be given permits to drive and the latter licenses to drive. Both permits and licenses should be in the form of little pocketbooks where records of arrests for traffic violations may be made by the magistrate. These permits should contain a description and photograph of the driver and such other details as may be thought necessary for identification. The licenses, however, should contain, in addition to these things, the fingerprints of the driver.

Each member of a family driving a motor vehicle should be obliged to comply with the foregoing requirements and obtain separate permits to drive.

Provisions for beginners should be made under proper restrictions.

An ample bond should be furnished by or for every driver of a motor vehicle or some approved form of liability insurance be adopted as a protection to the public.[1] Some restrictions on insurance companies should be in force to prevent them from settling cases out of court when such cases are the result of intentional collision, caused with the design of collecting damages.

Registration numbers should, above all things, be in two strongly contrasting colors and we should work towards the time when one registration number will be good anywhere in the United States or its territories.

At the present time, on many cars, the rear registration plates are hung either under or in the shade of some projecting part of the vehicle or load so that they are frequently illegible. Then again they are too often covered with dirt and oil and thus rendered unreadable. It should be a serious offense, subject to heavy fine, to have the registration number in such position or in such condition that it cannot be easily read. The front numbers are often partially hidden by the bumper. This also should be prohibited. It does not make so much difference as to the exact location of the number plate on the car either in front or rear, provided it is so placed that it can be easily read day and night by drivers and pedestrians. At the present time, many number plates are tipped so that the top is further out than the bottom. This should be reversed; the bottom of the number plate should protrude a little further from the vertical than the top for better visibility. It should be required also that the rear light be sufficiently brilliant to illuminate the number plate amply and that it be provided with two electric bulbs turned on by one switch to reduce the danger of the light being out.

Any caution light applied by the driver from his seat should be separated from the rear or tail light sufficiently so that the lights do not blend. As the red light has to be on the car anyway, these extra lights applied by the brake should be yellow. Conservation of space being an important point to be considered, the word "Slow" abbreviated to "SLO" is recommended.

When the tail light is on or off, it should be so indicated by a small bulb on the dash if such an arrangement can be devised.

There is also the question of the so-called parking or anchor light now placed on the left hand side of the car. When cars are ranked on the left hand side of a one-way traffic street they should have an anchor light on the right hand side. It would, of course, not be necessary to use current for both anchor lights at the same time.

As to head lights, no type so far has been adopted anywhere that is en-

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[1] The State of Connecticut has lately passed a Financial Responsibility Law on this subject. It is published in Bulletin No. 26 by the Department of Motor Vehicles, Hartford, Conn.

tirely satisfactory. In fact, the lights now in use are perhaps more glaring, dangerous and otherwise objectionable than those we had fifteen years ago. I believe that the Bureau of Standards, with the invited assistance of lighting engineers and manufacturers throughout the country, might adopt or devise something that would be far better than what we have now, and that therefore definite action should not be taken on this subject until a recommendation is formulated by the Bureau of Standards.

There is now in use on some cars a new kind of lamp to illuminate the right hand side of the road. This promises to be very useful but should be perfected so that the light itself will not be blinding to approaching traffic.

PART II

TRAFFIC GUIDES

The term "traffic guides" means signs and lights, "standards," "dummy cops," "bumpers," "semaphores," "crowsnests," lines on the pavement, and such other devices as may be of assistance in the regulation of vehicular or pedestrian traffic.

DIVISION A

SIGNS AND LIGHTS

Until a few years ago, the only highway traffic signs were those at cross-roads and junctions, giving the distance and direction to other towns and villages.

In November, 1903, one hundred blue and white enameled signs, directing slow moving vehicles to keep near the right hand curb, were put in use in New York. These were probably the first traffic regulation signs ever used (with the possible exception of the one-way bas-reliefs used in Pompeii). They proved very useful and their number has greatly increased in New York but, curiously, other cities, except London, have not appreciated their educational advantages.

Within the last decade traffic signs have multiplied in number and variety. They are of all sizes, colors, shapes and wording, according to individual fancy. This is, of course, confusing and unintelligent.

In the past few years, many kinds of traffic lights have been used in cities and some in the open country. Everything that has to do with traffic should, as far as possible, be uniform. Both traffic signs and lights should be standardized as to color, and traffic signs also as to shape, graphics, wording and height from the ground.

The experience of the railroads has demonstrated that the following colors should be employed. *Red* for Danger—*Yellow* for Caution—Proceed slowly and with care. *Green* for Safety—Proceed as usual.[1]

The three colors named should therefore be used consistently for these

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[1] The light transmission of standard traffic signal lenses is as follows:

Red—ten to twenty-two per cent.
Green—twelve to thirty per cent.
Yellow—twenty-six to fifty-two per cent.

By this it will be seen that more light transmission is lost by red than by green and by green than by yellow. (Information in letter from National Lamp Works of the General Electric Company, dated Dec. 1, 1925). Doubtless the lighter yellow a light is, the less power would be lost in transmission and with an absolutely white light, if such could be produced, there would be the least of all lost. However, a white light is not so well seen against a blue sky background as is a yellow one and therefore there should be some yellow in the light to make it more visible against the sky.

traffic signs and lights.[1] The three kinds of signs should be known as Primary Signs.

The explanatory part of each sign expressed by words or graphics should, of course, be in the color required as indicating danger, caution or safety, each on a strongly contrasting background, as follows:

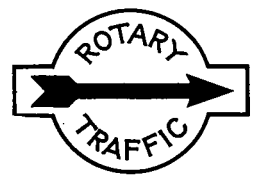
Red—for *danger*—on a white background—shape, round.
Green—for *safety*—on a vertically striped green and white background,—shape, hexagonal.
Yellow—for *caution*—on a black background—shape, square.

There should also be three kinds of Secondary Signs, as follows:

Information signs for stationary vehicles and pedestrians, indicating ranking and parking spaces, the prohibition or limiting as to time of ranking and parking of live or dead vehicles, street-car and bus stops, cabstands, etc.,—black on a yellow background—shape, oval.

Security signs for pedestrians indicating crosswalks, safety, danger and prohibited zones—blue on a white background—shape, triangular—those for crosswalks with point up, those for the different kinds of zones with point down.

Direction and *Distance* signs, including those for detours—black on a white background—shape, rectangular, except for Rotary Traffic and One-Way Traffic signs, the shape for both of which shall be as shown on the accompanying cuts, the one for One-Way Traffic having the colors reversed.



The bottom edge of all traffic signs (except for danger and caution signs when they are practically directly ahead and it is of advantage to have them low enough to be illuminated by the headlights and also except security signs for pedestrians and those in regard to the ranking and parking of live or dead vehicles, which should usually be considerably lower) should be about 6′ 3″

[1] An important suggestion has been made by Mr. A. G. Straetz, a Civil Engineer, who has devoted much time to traffic, that on account of certain people being color blind or partially so, possibly white or yellow lights used as position lights would be better than those of any other color:

Three lights horizontal indicating danger or stop.
Three lights perpendicular indicating safety or go.
Three lights at 45° angle indicating caution or go slow.

from the ground on which they stand, whether roadbed or sidewalk,[1] in order to give ample clearance to pedestrians. On an up-grade they might be put from three to six inches higher and on a down-grade from three to six inches lower, according to the steepness of the grade in order that they may come well within the range of horizontal vision.

No signs should project over the roadway under any circumstances since, if they do, they are apt to be hit by vehicles. If the standards are on the edge of the sidewalk, the signs should be pushed over, out of center, with the standards sufficiently to the right so as not to endanger passing vehicles.

The combinations of colors[2] to be used in traffic signs should be prohibited on any other signs near the curb in city streets or on any part of a country highway.

There seems to be a growing opinion among motorists that signs of caution should be simplified and that perhaps one sign of general caution would be better than many for the reason that if warned against some special danger, one is apt to look for that only and forget others quite as menacing.

The first set of well-thought-out signs was used in France over fifteen years ago. Since that time, different states, cities and towns have independently adopted their own signs, resulting in great confusion.

Some three years ago, the Sectional Committee on Codes for Signs and Signal Lights of the American Engineering Standards Committee was formed and has met from time to time but as yet has not come to any definite conclusion which has been approved by the General Committee. The Bureau of Public Roads in July, 1925, took the matter up also and has since been working upon it and now the Eno Foundation for Highway Traffic Regulation, Inc., is preparing to offer a set which it hopes may be thought sufficiently well of to be adopted for standardization. The Foundation has attempted to assimilate the best details from such signs as have already been recommended or are in actual use.

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[1] The Automatic Signal & Sign Company of Chicago make an excellent square reflecting red danger signal which is mounted on a low standard so that headlights shine on it. The Lyle Reflecting Danger Signal Co. also provides a good type. If either of the aforementioned signals were placed in the center of a white disc it would be one of the most effective safeguards on country roads. Both of these are cheap—and a very important point—need no self illumination.

[2] It is difficult to find a paint for signs or signals with the right shades of color which do not quickly fade and which are durable. The railroads have been using Ripolin, originally made in Holland. It can be obtained from The Glidden Company, Cleveland, Ohio. Its first cost is high but as it holds its color and lasts extremely well, it is economical. It is made in black and white, red, yellow, blue and green.

These pigments should be applied on top of Special Primer No. 626. I strongly recommend that these paints be used for all signs as they are the only ones I have so far seen that have been satisfactory. The writer, of course, has no financial interest in this company and should be glad to see other paints tested out alongside of these in order to discover something better if there is such a thing.

DIVISION B

STANDARDS

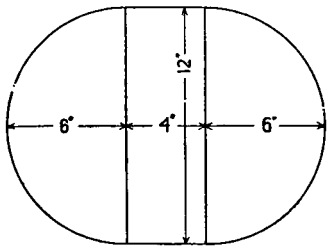
Stationary standards for signs have been designed by the Bureau of Public Roads which are practical and economical since they are adapted for most country road signs and for some of those required for city streets. I prefer, however, for city streets a round iron pipe, let into the sidewalk and set in cement about twelve inches from the edge of the curb. The signs should be secured in place at the top of the standard by a dowel.

Portable traffic standards are usually made of iron pipe about 1¼ inches in diameter and 4 feet high, with a round iron base.

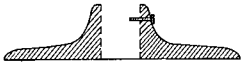
Lately, many standards have been made larger, heavier, and higher, on the theory that they are harder to knock over. It has been lost sight of, however, that if heavy standards are knocked over they are very apt to cause serious injury to pedestrians and vehicles.

Formerly where there was a row of standards at Safety-Car-Stop zones they were often connected with ropes and even with chains, iron rods or pipes. Such connections are a source of danger because if one standard is knocked over the others are apt to be pulled down with it.

Portable traffic standards should be only sufficiently heavy to keep them in place in a high wind. The base of the standard should be in the form of an elongated circle to prevent rolling if knocked down.



The base should have a round hole in the center to receive the iron pipe which should be secured by a set screw or rivet. The iron pipe should not be screwed into the base as the thread weakens it, resulting in expense for replacements. Steel pipe is better than iron as it does not bend easily. In some instances, a hickory or other hardwood stick is better than metal, as for example, for danger flags at street excavations. The base should be cast with a collar, to hold the pipe or stick securely in a vertical position.



The height of the portable standard should not exceed 4 feet 6 inches unless it be one for a lamp to be used inside a safety, prohibited, restricted or danger zone, remote from its border, where the chance of its being knocked over is small.

The top of the standard should be fitted with an upright ring easily removable, to be replaced when necessary by a lamp socket, bracket or sign.

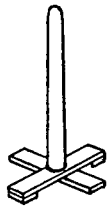
The bases and tops of portable standards should be painted bright red. The pipes with black and white bands from 8 inches to 12 inches wide. The top and bottom bands should be white.

Wherever a portable standard is used, a white disc considerably larger than the base of the standard should be painted on the pavement to insure the accurate placing of the standard, to afford it protection and to increase its visibility.

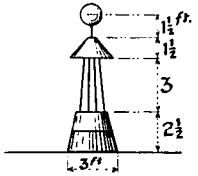
DIVISION C

DUMMY COPS

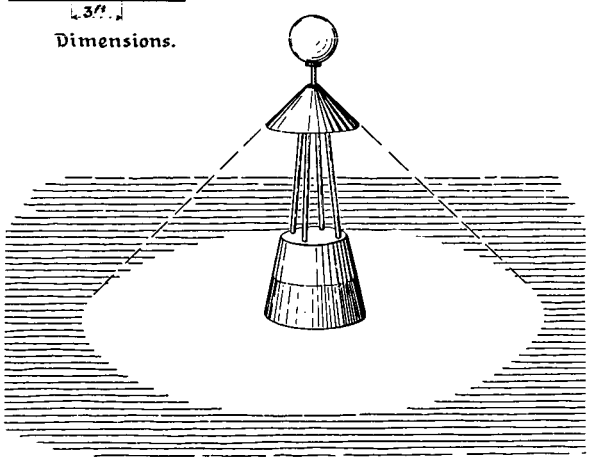
The Dummy Cop, in its simplest form, consists of a post designed as a substitute for a traffic officer. The first drawing of a Dummy Cop was published December 24, 1904, the design being still in extensive use in some states.



There are now many models of Dummy Cops. Tens of thousands of them are in use and their number is constantly increasing. The Dummy Cop is far



Dimensions.



Dummy Cop especially designed for use at right angled intersections where rotary traffic is in operation. Notice the shade throws the light on to the pavement. The shade should be made with greater or less angle in proportion to the circle on the pavement which it is desired to light.

more effective and certainly more economical than any policeman other than a thoroughly trained and intelligent traffic officer.

The best colors for Dummy Cops are the same as those for traffic standards. The Dummy Cop should always stand on a good sized white disc to add further visibility and to insure accuracy of position.

In many places, since the Dummy Cop has proven so useful, permanent structures with lamps and signs, many of them ornamental as well as useful, have been built at the intersections of roadways in city and country. If permanent structures are to be used, the bases should be of such form as to deflect the wheels of vehicles striking them, and these bases should be kept painted white except for about six to twelve inches at the bottom, which should be painted red.

A Dummy Cop (and the same may be said of a traffic bumper) should not be used at the center of intersection of streets which cross each other at an angle not practically a right angle as this practice makes one-half of the turns too acute. However, they may be used to advantage at acute angle intersections but four will be required at each intersection. (See Diagrams in Part III.)

DIVISION D

BUMPERS

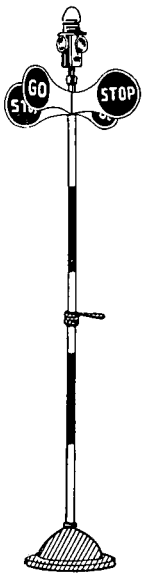
The Traffic Bumper, sometimes called Mushroom or Button is a device which can be used instead of a dummy cop and is in some cases to be preferred. The bumper consists usually of an iron disc from 12 inches to 18 inches in diameter and 4 inches to 6 inches high.

Bumpers should be kept painted white and should stand on a disc also painted white so that they can be easily seen. Several kinds lighted by electricity are very good.

DIVISION E

SEMAPHORES

The so-called "Go-Stop" semaphores now in general use are very imperfect in their present form because the signs on them have no neutral position. If the signs could be turned or dropped down so they could not be seen, the semaphore could be left in position when there was no traffic officer present and so serve as a dummy cop.



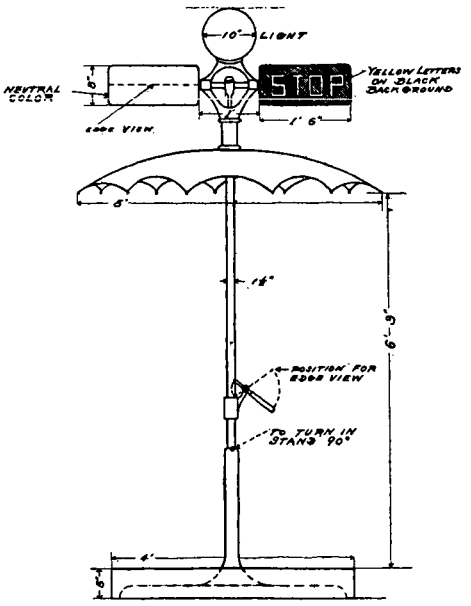
It is a question, however, whether a semaphore is not more of a hindrance than a help in regulating traffic. It certainly is no material help to an expert traffic officer and it is doubtful whether it improves the work of an inexperienced officer. An inexperienced officer is, after all, not nearly as good as a dummy cop, which, at least, does not interfere with traffic by incomprehensible gestures which tend to unnecessarily delay and confuse both drivers and pedestrians.

One of the objections to the use of the "Go-Stop" signal is that the traffic officer often fails to turn it promptly. When it is considered that the hours of duty are long and tedious, it is not to be wondered at that the officers are sometimes a little absent-minded. Another difficulty is that when a signal

is turned against traffic the officer is often obliged to beckon individual vehicles forward in order to facilitate their movement. This necessarily results in uncertainty, as the drivers do not know whether to obey the semaphore or the hand signal of the traffic officer. The "Go-Stop" semaphore for individual work is not as good as the hand because the semaphore signals all vehicles in sight to go in one direction and to stop in another, while the hand of an officer can signal to them individually and weave them in and out without causing unnecessary delay.

The "Go-Stop" semaphore should be discontinued absolutely unless it can be so constructed that it will be practical to place its signs in a neutral position.

The following drawing shows one method of construction by which the signals can be placed in a neutral position. The handle turns the semaphore through an angle of 90 degrees when revolving around the shaft, and when it is desired to turn the signals flat to the ground in a neutral position the handle is simply pushed up. Notice the wooden platform 8 inches high and 4 feet square which covers the iron base of the stand and affords dry footing for the traffic officer as well as giving him the advantage of extra height.

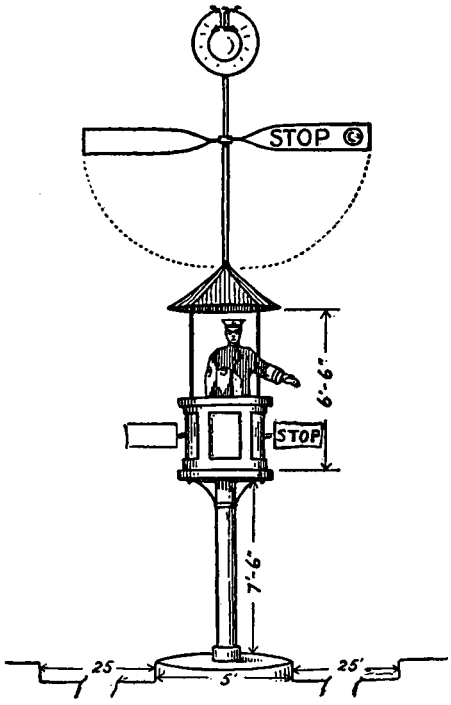


The working drawing does not show colors, which should be the same as in preceding cut. The umbrella should be red.

DIVISION F

CROWSNESTS

A Traffic Crowsnest, as described in an article published March 7, 1914, and in The Science of Highway Regulation, is a raised and covered sentry box to be located at important street intersections or foci. The traffic officer has a clear view of traffic in all directions, is moderately protected from the weather, isolated from distractions and able to do more effective work than when on the street level.



On the Crowsnest are two pairs of semaphore arms worked by electric switches. At night these arms carry a red light. Lower down on the Crowsnest, as shown in the drawing, are two other semaphore arms, located at a height where they can be seen from beneath an automobile hood. The upper arms are to signal vehicles some distance back and the lower ones to signal

those nearby. The semaphore is for the Block System, when it is necessary to employ it temporarily, although the more advanced method of Rotary Traffic at intersections where there is sufficient room will probably make the Block System superfluous, at least most of the time. The semaphores, however, are a safeguard when necessary to temporarily stop traffic in case of the approach of fire apparatus or other danger.

Telephone equipment furnishes direct communication with police and fire departments and nearest police station, and also with other crowsnests if located on the same street, while electric push button signals connecting the crowsnests indicate such warnings as "Clear the Street for Fire Apparatus," "Look Out for Runaway," etc. The indicators should show from which crowsnest the signal is given in order that the distance of the approaching danger may be estimated. The crowsnest is also equipped with an electric heater and a revolving stool, adjustable as to height. The stool can be placed in position for use when required and when not needed, pulled out and set to one side.

In 1917, the first of these crowsnests was put in use in Detroit. Slight improvements have been made since that time in the Detroit crowsnest and in those used in other cities. The crowsnest used in Detroit in 1917 is shown in the accompanying illustration.

This was modeled after the pattern above described except that signal lights were installed in place of semaphore arms. The latter would be better as the falling and rising of the arms attract the attention of the eye. The arms could be equipped with a tinkling bell to attract the ear also. In order to describe the working of the crowsnest, extracts of letters from Detroit are given.

January 24, 1918.

"My Dear Mr. Eno:

"I have yours of the 18th inst., and in reply, would say that we put the Crowsnest in operation at Woodward and Michigan Ave. on Tuesday, Oct. 9, 1917. I assure you that it was my intention to write you about this at that time but it was partly through neglect and partly owing to the pressure of other matters that I failed to do so. You say you are anxious to know all about it. I am anxious that you should.

"It was this way: Last summer one of the Aldermen suggested to the Commissioner 'That something elevated be placed at this corner for the traffic man to stand on.' I immediately recommended 'Mr. Eno's Crowsnest.' Together with this recommendation I submitted a sketch similar to the one in your pamphlet. This recommendation was approved by the Commissioner and construction of the Crowsnest commenced. About a week after it was put in operation I reported to the Commissioner that 'It proves to be a successful innovation beyond our expectations.' We did not realize what an advantage the elevated position gives the officer. He has a clear view over the tops of street cars and automobiles and can command the whole situation for two or three blocks in all directions. Men at other corners in the vicinity work in conjunction with this master semaphore with the result that movement of traffic is noticeably faster and safer. Drivers and pedestrians frequently expressed their approval. It works to the advantage of the driver because they have the officer in it in plain view at all times from every angle. Direct telephone communication between the booth and First Precinct Station is another good feature.

"One of the better proofs of its success is that one officer can control the traffic alone, while heretofore it required two men. One of our oldest and best traffic officers who had been regulating traffic at this corner for years after occupying the Crowsnest for one day, said 'It is the best thing in the world.'

"I am enclosing herewith a cut of the tower clipped from a recent issue of 'Popular Science.' I was informed there was a cut of it in 'Popular Mechanics.' You will notice the change in the type of semaphore. Under a separate cover I am sending you a photograph.

"The location of this tower, as you may remember, is in front of the City Hall. The Commissioner has ordered another one to be constructed at Michigan Avenue and Griswold Street, which is one block to the westward. * * *

(S) W. P. RUTLEDGE,
Chief Inspector."

February 2, 1918.

"My Dear Mr. Eno:

"Upon his return from Washington recently, Commissioner Couzens instructed me to forward to you a photograph of our elevated Traffic Booth which I am sending you under separate cover. It is situated at the intersection of Woodward, Michigan and Munroe Avenues, in front of the City Hall, at one of Detroit's heaviest traffic points.

"Your specifications were followed quite closely in its construction. Please note that the 'Go and Stop' signal is indicated below as well as on top. The lower one is specially for the benefit of drivers making a left turn, who come to a stop and await the signal to make the turn; also, it is of value to pedestrians who cannot very well see the signal which is located on the top.

(S) GEO. A. WALTERS,
Secretary to Commissioner."

February 26, 1918.

"My Dear Mr. Eno:

"Your suggestion that a seat similar to a bicycle seat might be placed in the 'Crowsnest' is a good one, and I will see about having one installed.

"I think I told you we were heating the tower by electricity. We also have a telephone in it which has been used to good advantage on more than one occasion.

(S) W. P. RUTLEDGE,
Chief Inspector."

October 12, 1920.

"My Dear Mr. Eno,

"* * * Speaking of the Traffic Crowsnests, I do not know whether you are aware that we have increased the number in this city until we now have six in operation at our heaviest traffic intersections, and are preparing to install the seventh one. We have never had occasion to regret for one moment that we adopted your idea and installed these Crowsnests, but on the other hand, we sometimes feel inclined to be proud of the fact that we were pioneers in this regard. Not only that, but everyone realizes the practical advantages of this system.

(S) W. P. RUTLEDGE,
Superintendent."

Rotary Traffic, aided by traffic crowsnests, at the center of roadway intersections will in the writer's opinion eventually be adopted in regulating traffic on Fifth Avenue in New York.

Crowsnests should be located not more than four to five blocks apart, although one at every intersection would not be a mistake.

Since the above letters were written, there has been quite an increase in the number of crowsnests in Detroit and other cities have followed Detroit's lead, apparently with satisfactory results.

Rotary traffic, aided by traffic crowsnests, at important or preferably at all intersections on Fifth Avenue and eventually at the intersections or foci of all streets where there is sufficient room to inscribe a circle of seventy feet or more in diameter within the sidewalk corners, will take the place of the block system in my opinion.

The block system, however, can be immediately put into operation temporarily from the crowsnest to clear a blockade of any kind. Some five years before the crowsnests were adopted in Detroit an experiment was made with improvised towers on Fifth Avenue, New York, to synchronize the block system over a number of intersections by a system of flag signals. This attempt proved a failure, principally because conditions vary at different intersections.

If the block on Fifth Avenue, for instance, is sufficiently long for the vehicles on 34th and 42nd Streets to cross, it is usually much too long for most of the other side streets. In spite of this sufficiently well demonstrated failure, early in 1919, traffic towers were put on Fifth Avenue to carry out a synchronized block system. These towers were not even placed at the right spots. The only place to put a traffic crowsnest or tower is evidently at the center of intersection where it can be seen from all directions. These towers were located without any regard to the traffic control of the cross streets.

In the spring of 1922, new towers were designed to take the place of the old ones on Fifth Avenue and a fund of $125,000 was raised to pay for seven of them.

Meantime, the old towers have been erected in other places in New York and many more have been added, with the result that this system is tying up New York worse than it was ever tied up before. The traffic capacity on Fifth Avenue and some of the other avenues has been reduced at least fifty per cent and the best thing to do now is to replace the present towers with others at street intersections which are on the principle of those in Detroit but preferably with the arm semaphores. Each intersection should be operated independently of all others when it is necessary to resort to the block system at all but the use of the rotary system should be the regular procedure. By this method, vehicles will be distributed practically evenly over the whole surface of the roadway and be able to cover a longer distance in

a shorter time and at a safer speed than they do now, since their operations will be practically continuous.

At the present time, when the block is raised, the vehicles which have been held back dash forward at much too great a rate of speed considering that they travel so close together.

DIVISION G

LINES ON THE PAVEMENT

It is only comparatively lately that paint lines on the pavement[1] have begun to be appreciated at their full value. That they have not been of more advantage in cities is largely due to the fact that their location and form have not been determined upon by engineers sufficiently versed in traffic requirements.

The use of paint lines on country highways has been so far practically limited to central guide lines and to right angled caution lines, often accompanied by arrows or words of explanation.

Crosswalks also should be marked out by paint lines and security signs at convenient distances apart on main highways in the country since it is often both difficult and dangerous for pedestrians to cross without them.[2]

I should like to see every paved roadway which is wide enough for two lines of vehicles, whether it be in the country or in the city (except where modifications are necessary on account of an intersection, junction or focus of roadways or some central obstruction such as car-tracks, etc., etc.) marked with a central paint line six inches wide—the line to be an unbroken one

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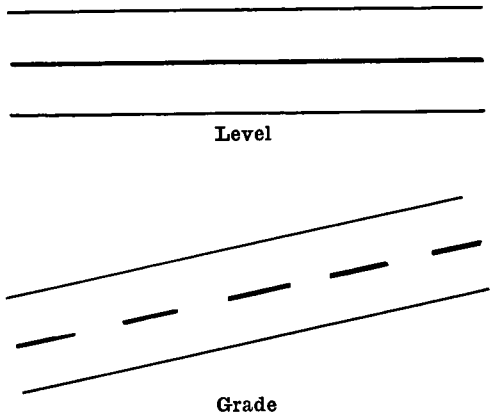
[1] I have already recommended a paint for signs and I now recommend a paint for lines on pavements as it is the only one I have found so far that is good although I advise exhaustive trials of other kinds in order that if we discover something better we may use it. The paint I recommend is called Safety-White-Line Paint and it is made by the same people who make the sign and signal paint. The same Special Primer No. 626 should be applied first to the pavement, the pavement of course being dry and free from dirt before application. One coat of the White Line Paint is sufficient on top of the primer. The lines should be patched up from time to time when necessary. I make a strong point of recommending this paint because so much inferior paint has been used which is not much better than whitewash that I want to protest against it. One kind which was being used largely I found, on inquiry, was reported to be made of fish oil and whiting and of course it disappeared rapidly. The cost of application of paint lines to pavements is about eighty-five per cent labor and fifteen per cent paint. For this reason it is economical to use the paint that will last the longest, regardless of the cost of the paint itself.

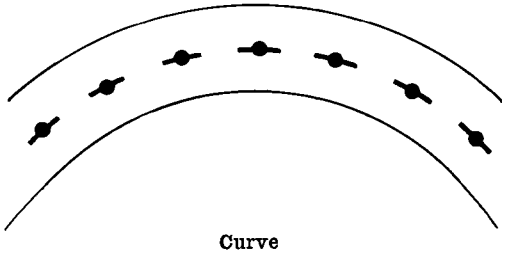
[2] Paint lines on sidewalks would be useful in congested areas to prevent certain parts of the walk from being blocked by people standing still or loitering, as for instance, on Fifth Avenue, where during the noon hour the walks are almost impassable on account of the overflow of workers from manufactories who have no idea of using sidewalks in a reasonable way.

except on grades of greater than say five per cent, where the line should be a broken one and on curves where the radius is less than say three hundred feet, a broken one with a disc in the center of the painted part eighteen inches in diameter to accentuate the necessity of keeping to the right.[1]



Level

Grade



Curve
or
Curve with Grade

Lines across the roadbed have been quite extensively used in some states to indicate the presence or distance ahead of certain dangers which can be guarded against through caution. These lines are often accompanied by the name of the danger ahead, as for instance, "grade crossing," "narrow bridge," "steep hill," etc., and sometimes the caution is repeated by having a single line a certain distance away from the danger and double lines nearer to the danger. I think the use of such lines should be greatly increased provided

[1] Whether or not the part of the line which is to be put down should be of the same length as the space which is to be omitted is a question which should be decided after careful experimentation. It may be that some differentiation of these relative lengths would be useful to indicate the amount of curve or grade existing.

care is taken to put them only where they indicate a real reason for extra caution.

Perhaps the most important lines of all in city streets are those marking crosswalks. It should be kept in mind, however, that the usual method used to mark crosswalks is in itself a serious danger because the line marking one side of the crosswalk is ordinarily the line of the curb continued, thus leading pedestrians over the most dangerous part of the roadway.

Crosswalks at right angled intersections should be back of and bounded on one side by the arc of a circle described within the four street corners and at intersections which are not at a right angle, back of the oval within such corners.

> It is a good rule for pedestrians to remember always to keep a little back from the intersection of roadways while crossing and to carefully watch for the approach of vehicles. It is often even safer where the crosswalk is not marked by lines, if there is a vehicle to your right standing at the curb, to go just in front of it and cross there, as by so doing you will have a longer time to see a vehicle turning to the right from another street into the one you are crossing.

Crosswalks, especially in cities, should be marked by three lines—one on each side and one in the center to divide it according to direction. Direction arrows painted on the crosswalks will create another well worth while safeguard, since they minimize confusion of pedestrians while crossing.

As there are such a great number of complications in most cities, especially in our older ones, due to the fact that until very recently, no study of traffic conditions had ever been made, it is the part of wisdom to have all crosswalks laid out by a civil engineer who has made a real study of traffic requirements. The same argument applies also and perhaps to a greater degree to Prohibited, Restricted, Danger and Safety Zones, to Traffic Whirlpools, to Ranking and Parking spaces and the marking out of stalls in them so that they may contain the maximum number of such stalls without waste of space, also to the designing or selection of dummy cops, bumpers, semaphores, crowsnests and proper lighting fixtures and especially their location at intersections and crosswalks.

In the past, most, if not all of the work of locating lines has been left to local police officials who usually have had no adequate training for the purpose. The results have, of course, been unsatisfactory and uneconomical. Each and every such traffic problem should be worked out to scale on a drawing table before it is transferred to the road surface which should always be done under the direct supervision of a civil engineer who has qualified himself for traffic work.

PART III

SPECIAL HIGHWAY TRAFFIC REGULATION

Special Highway Traffic Regulations are those which in addition to the General Regulations are of use in traffic control. The General Regulations, as already explained, are the ancient rules of the road developed for modern requirements. With only the General Regulations in force, if thoroughly understood by both drivers and pedestrians, traffic can move safely and effectively anywhere, but under certain conditions and at certain times, traffic can move still better through the adoption of certain special regulations or systems.

CHAPTER 1

One-Way Traffic

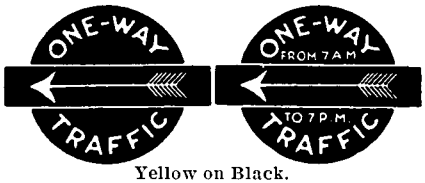
We will first take up One-Way Traffic because although not generally known, it is probably the oldest method in the world for the control of traffic in narrow streets. The earliest evidence of its existence is shown by bas-reliefs of chariots in Pompeii pointing the direction in which vehicles had to move on streets where the roadways were wide enough for only one line of vehicles. The Pompeians were apparently more alive to traffic requirements than we are today for, until very recently, in many cities and in some of them even now, vehicles are still allowed to move in either direction though there may be roadway width for only one vehicle at a time.

One-Way traffic was first put in use in a few streets in New York in the spring of 1907; in Boston in the fall of 1908; in Paris in the summer of 1909 and in Buenos Aires in 1910. It is now used in most cities throughout the world. Rotary traffic at circles, or other forms of centralized obstruction, is one example of it but this newer system will be discussed in Chapter 3 because I want the consideration of it to follow Chapter 2 which will be on the Block System for which the rotary system is designed as a substitute wherever possible.

All city streets with roadways not wide enough for *two* lines of vehicles should of course have one-way traffic at all hours of day and night. All city streets with roadways not wide enough for *three* lines of vehicles should have one-way traffic all the time unless ranking is confined to one side of the street. All city streets with roadways not wide enough for *four* lines of vehicles should have one-way traffic at least during the busy hours in order to avoid confusion. No city streets with roadways wide enough for *five* lines of vehicles should have one-way traffic unless it be provided with refuges (zones of safety) at all cross-walks.

Wherever two roadways are practically parallel and near together, this system has been very successful and in Paris, for example, has solved many problems that formerly seemed hopeless.

Attention is drawn to the fact, however, that it is economically stupid to adopt one-way traffic streets unless proper signs are amply provided, indicating the direction of the movement of traffic. Since a sign costs but an infinitesimal fraction of a policeman's yearly pay, the economy is plainly evident.



Yellow on Black.

An article was published on One-Way Traffic in Motor Travel in November, 1917, which is here reproduced since the controlling arguments then advanced have not lessened in importance. However, since the article was written, many of the numbered streets in New York, some of them badly chosen, have been restricted to one-way traffic. A closer study of the question as set forth in the article quoted might well even now result in selecting practically all the streets mentioned at that time for one-way traffic without changes.

ONE-WAY AND TWO-WAY STREET TRAFFIC

How the New System Should be Applied to East and West Streets in New York from 14th to 59th Streets, inclusive

By WILLIAM P. ENO

"I had intended to write this article before, having made a careful study of One-Way Street Traffic some years ago, especially in regard to its suitability on the East and West streets from 14th to 59th streets, inclusive.

"I am impelled now to avoid further delay by the fact that the authorities are already widening the roadway of 44th Street and have decided to widen that of 38th and other streets. Of course, the streets which should remain Two-Way Traffic streets are the ones to widen first and both 38th and 44th streets, in my judgment, should be made One-Way Traffic streets and therefore should not be widened, at least without further consideration and not until after a practical trial has been had by actual but inexpensive experiment to determine definitely which streets should be for One-Way and which for Two-Way traffic.

"Such an experiment can easily be made without any change in curb lines, simply by the use of suitable signs marking clearly each street where traffic is to be restricted to one direction.

"There are three fundamental conditions which should be observed in deciding which streets shall have One-Way Traffic and which shall have Two-Way Traffic:

First: Wide Streets

"On account of their width the following streets should have Two-Way Traffic: 14th, 23d, 34th, 42d and 57th Streets.

Second: Streets Bordering on Parks

"Any street bordering on a park should have Two-Way Traffic because traffic should not be diverted from its natural course further than necessary. Therefore the following streets should have Two-Way Traffic: 17th, 26th, 40th, and 59th Streets.

Third: The Relation of One-Way Traffic Streets to Two-Way Traffic Streets

"It is highly desirable that a One-Way street should have its traffic move in the same direction as traffic moves on the side nearest it in an adjacent Two-Way Traffic street, otherwise, it will occasion unnecessary distance to be traversed and an extra street to be crossed —therefore the following streets should have their traffic move East: 16th, 19th, 22d, 25th, 33d, and 56th Streets, and the following streets should have their traffic move West: 15th, 18th, 21st, 24th, 27th, 35th, 43d and 58th Streets.

"Now we have provided for all streets up to 27th Street, inclusive, except 20th Street, and as we can not make it a One-Way Traffic street and comply with all the aforesaid fundamental conditions, we should make it a Two-Way Traffic street.

"Between 27th and 33d Streets we have to provide for 28th, 29th, 30th, 31st and 32d Streets, an odd number (five) of streets. If we make 29th Street a Two-Way Traffic street we can make the other four One-Way Traffic streets and comply with the required conditions.

"Between 35th and 39th Streets we have to provide for 36th, 37th and 38th Streets, an odd number (three) of streets, and as in the preceding case, 37th Street should have Two-Way Traffic and 36th and 38th Streets One-Way Traffic to comply with the required conditions.

"Between 40th and 42d Streets we have but one street, 41st, and as it can not be made a One-Way Traffic street and comply with the conditions, it should be a Two-Way Traffic street.

"From 43d to 56th Streets we have twelve streets, an even number. These can alternate, according to direction, as One-Way Traffic streets and comply with the conditions.

"Between 57th and 59th Streets, we have only 58th Street, which must be a Two-Way Traffic street, as it can not be a One-Way Traffic street and comply with the conditions.

"The whole list of streets, then, from 14th to 59th Street, inclusive, worked out as already described, is as follows:

Two-Way Traffic East and West	One-Way Traffic East	One-Way Traffic West
14th St.	16th St.	15th St.
17th St.	19th St.	18th St.
20th St.	22d St.	21st St.
23d St.	25th St.	24th St.
26th St.	28th St.	27th St.
29th St.	31st St.	30th St.
34th St.	33d St.	32d St.
37th St.	36th St.	35th St.
40th St.	39th St.	38th St.
41st St.	44th St.	43d St.
42d St.	46th St.	45th St.
57th St.	48th St.	47th St.
58th St.	50th St.	49th St.
59th St.	52d St.	51st St.
	54th St.	53d St.
	56th St.	55th St."

I have reproduced the foregoing article to emphasize the necessity of having a careful study made by engineers who have specialized on traffic, before extensive and unnecessary work of widening roadways is undertaken.

CHAPTER 2

The Block System

The block system consists in stopping and starting vehicles alternately at an intersection of roadways in order that traffic may proceed through each in turn.

It probably originated in England, was later adopted in France and was put into effect in New York in 1902.

One of the objections to the block system is that it often delays traffic

unnecessarily. Vehicles accumulate behind the block and rush through in a mass when the block is raised instead of filtering through continuously and distributing themselves more or less evenly over the surface of the street. If you will watch the operation of the block system from the upper window of a corner building or from the top of a bus you will see that just before the block is raised, much of the roadway surface ahead is practically unoccupied by vehicles. In other words, more than fifty per cent of the traffic capacity of the roadway surface is often wasted.

An additional bad effect of the block system is to greatly increase the speed rate with its attendant dangers in order to make up for loss of time occasioned by the enforced stops.

> The block system is a stop and dash system—either vehicles are completely stopped and waiting for a signal or they are dashing forward to make up for the loss of time when they were stopped. Once the block is raised, the temptation is to step on the gas and get as far as possible before the block is closed again. This results in a very large proportion of our city accidents. The only wonder is that more people are not killed by it. The synchronized block system is, of course, even more effective than the unsynchronized system in inducing drivers to increase speed to try to escape from the unreasonable requirements of enforced waiting.

Where the block system is used it should consist of a complete block of all cross traffic. The practice of allowing vehicles at the head of the lines on the street in which traffic has been stopped to turn into the street on which traffic is moving is dangerous to pedestrians and should not be permitted.

Before the "Go-Stop" semaphore was adopted, traffic officers were becoming increasingly efficient in enforcing a partial block system where or when a complete block was not necessary. The partial block consists in holding back or beckoning forward individual vehicles by hand signals to facilitate them in weaving in and out with the least possible danger or delay. Reliance on the "Go-Stop" semaphore has seriously interfered with the development of this highly desirable technique.

The partial block is far better than the full block when the traffic is light because it causes less delay and answers all purposes of the full block. Neither the full block nor the partial block, however, should be attempted by an inexperienced traffic officer and when a well-trained one cannot be provided, reliance should be placed on dummy cops or traffic bumpers. These answer the purpose very well if the drivers are properly qualified and pay due attention to Secs. 2, 3, 4 and 5 of Art. I of the GENERAL HIGHWAY TRAFFIC REGULATIONS for Vehicles.

Traffic crowsnests described in Part II—Division F, are most desirable and economical of men for the handling of both vehicular and pedestrian traffic at intersections under whatever system is in practice. Division F—Part II, deals with the synchronized block system at some length. It is most important and should be read again in connection with what follows. To the uninitiated, this system appealed very strongly at first and people are only now beginning to realize what a mistake it has been to try to control traffic at several intersections from any one intersection even though the intersections to be controlled are on the same thoroughfare. It is still worse when the intersections are on more than one thoroughfare and are controlled from some central point sometimes located far away and where traffic conditions are very different. A doctor might just as well treat all his patients, whether they have chicken-pox or brain fever with the same remedy. People are now however, beginning to see the fallacy of the synchronized block system. Of course it will be stopped eventually by public opinion but in the meantime the traffic capacity of the streets of New York and of many other cities which have followed its bad example is being seriously reduced. One has only to attempt to try to drive around the city a little to realize what a detriment the synchronized block system is to convenience and to safety as well, because it calls for a dangerous speed rate when the block is opened to make up for time lost when it was closed. How much better to have a low speed rate with continuous motion, capable of covering a longer distance in a shorter time.

I would suggest that those who have not already detected the faults of the synchronized block system, observe its effects from the top of a bus or from a corner window on Fifth Avenue. Note that when the block on the Avenue is raised, the vehicles spring forward at dangerous rates of speed, especially as they travel so close behind vehicles ahead. Then when the block on the Avenue is closed, observe the bunches of vehicles stopped behind the blocks at the cross streets, often when there is no local reason why they should be delayed at all. There may not be one vehicle even in sight on the cross street where the vehicles composing the bunch are, but the bunch has to wait just the same because the signals to stop and start are given from some remote point where there may be a local reason for delay. In other words, if the block is long enough for cross traffic to pass through 42d Street or 34th Street, it is usually much too long for the other streets. The trouble is still more apparent on Park Avenue as one cannot help but notice if he be on this avenue or crossing it.

It often happens that before covering a hundred feet on Fifth Avenue you have to stop two minutes for cross traffic to clear itself, then you turn

into a side street, only to have to stop at the next avenue for three minutes for north and south traffic to go through. Then perhaps you go a square or so on this avenue and have to stop two minutes again for cross traffic to pass, etc., etc.

It is sometimes almost an endless job to get anywhere in a vehicle with the synchronized block system in force. When you realize this, you decide to get out and walk to your destination.

We certainly do need a change in New York and in every city which has been induced to try the synchronized block system and the best way to get it is to employ as an advisor a trained civil engineer who has specialized in traffic regulation and who has that most important qualification of all—a mind that can visualize traffic movement.

I hope to see the day when the synchronized block system with all its attendant colored light signals will be but a memory of an attempt to regulate traffic in an impossible way. For too long a time New York and other cities have been the victims of an unsuccessful experiment which will be ended only after the general public is alive to its shortcomings.

I have lately received several communications from engineers and laymen on the subject of synchronized traffic. One letter dated October 31, 1925, is from a traffic engineer of experience who has been acting as consultant on surveys, planning, regulation and signalling. He writes as follows:

> "After intense effort (on the kind of work indicated above), I came to the conclusion that my present plan would not work out, perhaps mainly for the reason that most municipalities seem to be obsessed by the idea that traffic control signalling, synchronous or centrally controlled, would cure their traffic trouble.
>
> "This attitude of the municipalities practically forced me to approach the signal manufacturers to cooperate with them in traffic matters.
>
> "In the past three months, however, I have become even more conscious of the fallacy of rigid traffic control and have become firmly convinced of the fact that continuity of traffic is far more essential than control. This brings me to either a separation of grades or to the Eno Rotary Traffic principle and the urgency of widening the intersection rather than the street and of guiding traffic in fashion of your 'Whirlpool' system.
>
> "This change of mind has caused me considerable apprehension as I can not sincerely continue to propagate the application of control signalling as a remedy and I, therefore, can not serve the signal manufacturers. It has also brought me into a troublesome contrast with the tendencies of the municipalities."

In the September (1925) issue of "AERA" appears an article entitled "Synchronized Traffic Control is Costly to Street Railway." This article

points out the disadvantages of synchronized control from a new angle. It explains by diagrams and figures how in the city of Cleveland where they have tried synchronous control over a few squares it has resulted in an increase of power cost of from $124,848 to $146,166, or about 36 per cent. It further says, now that they are proposing to put synchronous control in several parallel streets, it will be necessary to take into consideration the tremendous increased expense to the trolley company, the point being that when all the street cars have been stopped, they all have to be started again at the same instant, resulting in an enormous temporary peak load.

I quote from another letter on this subject:

> "Relative to this fact, I have been recently informed in Newark, that it takes from four to five minutes longer for a trolley to cover the distance from Clinton Avenue to Central Avenue, a distance of about one-quarter mile since the installation of their tower on Broad and Market Streets than before the transformation of their control into a synchronized one."

Only lately I have received information that some of the towers in western cities have been replaced by synchronized light signals located on the street corners. This may be due to one of two causes—either to the lack of traffic acumen of officials in charge or to the over zeal of the manufacturers of synchronized light signals to make sales. The awakening of public opinion to the failure of the synchronized traffic system is therefore fortunate.

Another rumor has come to me which has not been authenticated that one of the cities which has bought synchronous light equipment is anxious to sell it for half what it cost. I believe it would be the part of good judgment for every city about to purchase these synchronous lights to make a very careful investigation not only of their merits but of the tactics which I suspect may be employed by the manufacturers.

It might be remarked here that if the corners of the sidewalks are cut back on a suitable radius for vehicles to make the turns easily it is impossible for the light signals to be placed on one pole, unless a bracket is used, and be sufficiently visible from both streets.

CHAPTER 3

ROTARY TRAFFIC

The Most Important Principle for the Control of Traffic So Far Advanced

In Chapter 1, I have attempted to show the limitations of the block system and especially how undesirable it is when an attempt is made to synchronize it. This chapter suggests a substitute called Rotary Traffic which can be applied successfully wherever the block system can be used, provided only that there be enough space between the curbs to make turns practical without backing. I shall first take up Rotary Traffic for use at the foci of roadways as it was first used at such places. I shall then follow with the application of Rotary Traffic to intersections of roadways.

Formerly at circles and similar barriers, where several streets converge, traffic went around in both directions resulting in much confusion and many accidents. In the summer of 1903, it was suggested to go around Columbus Circle in New York in one direction only. The plan is now generally called the "Rotary System" and the regulation for it is "A vehicle passing around a circle, oval or other form of centralized obstruction shall keep to the right of such obstruction."

It was not, however, until 1905 that rotary traffic was put into effect at Columbus Circle in rather a crude manner, in which, unfortunately, it still remains. (See diagrams 1 and 2.) In the same year, this system was recommended for the Place de l'Etoile in Paris, but was not adopted until 1907. (See diagram 3.) In 1912, a plan was prepared for rotary traffic at the Rond Point on the Champs Elysées (see diagram 4), which was favorably considered but action deferred on account of the war. Rotary Traffic is probably the one system that can materially simplify traffic at this congested center. A rotary traffic diagram for the Place de l'Opera was also prepared by Mr. Eugene Hennard, a noted French architect (see diagram 5), which leaves little to be desired, provided the existing subways and sewers are not in the way of the proposed tunnels for pedestrians, but even if the tunnels for pedestrians are not practical, the plan should be adopted as furnishing the best practical solution of the problems at this important focus.

You will notice from the diagrams that the central obstructions are not always circles. Those for the Rond Point and the Place de l'Opera are ovals while the one in Washington for Pennsylvania and New York Avenues is a triangle with the corners rounded off. You will notice further on in this chapter, other central obstructions in the form of an hour-glass and others of kidney shape, etc.

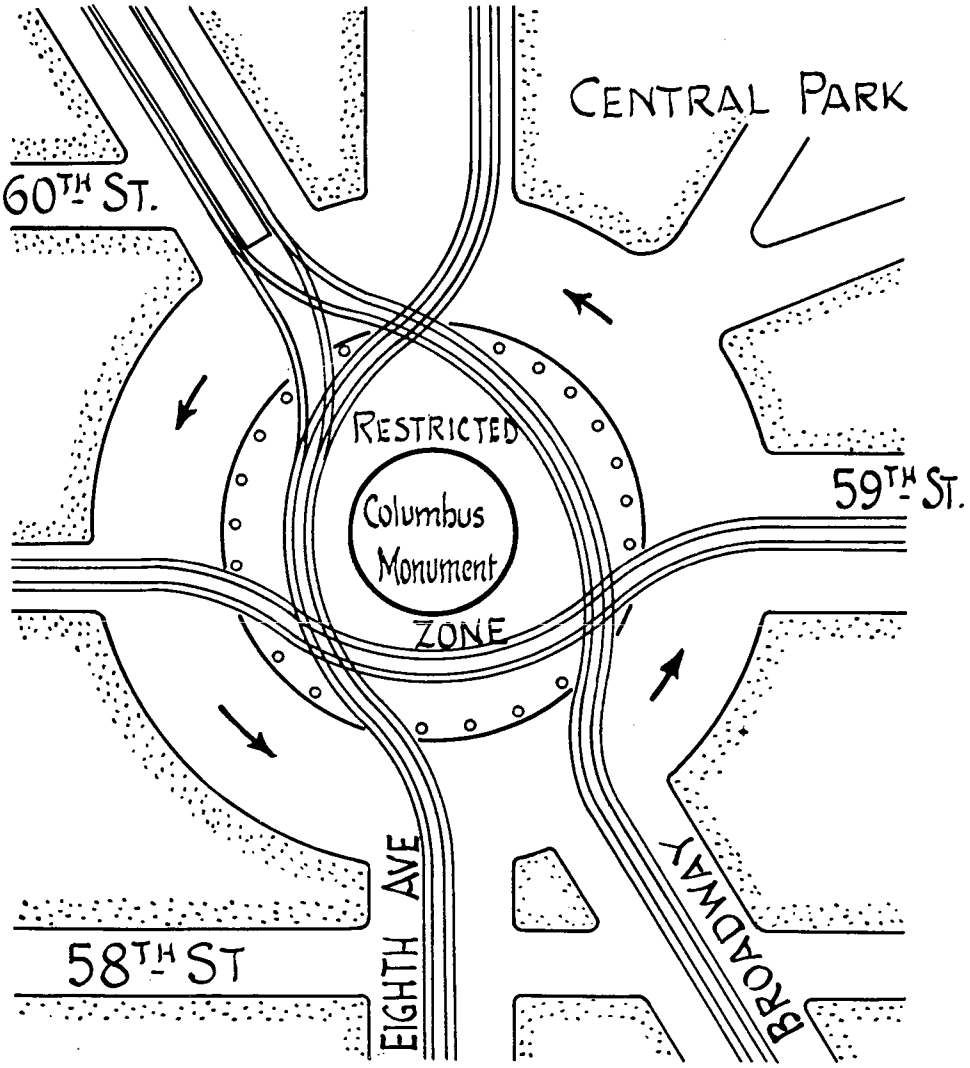


DIAGRAM 1
Present Plan in Use at Columbus Circle

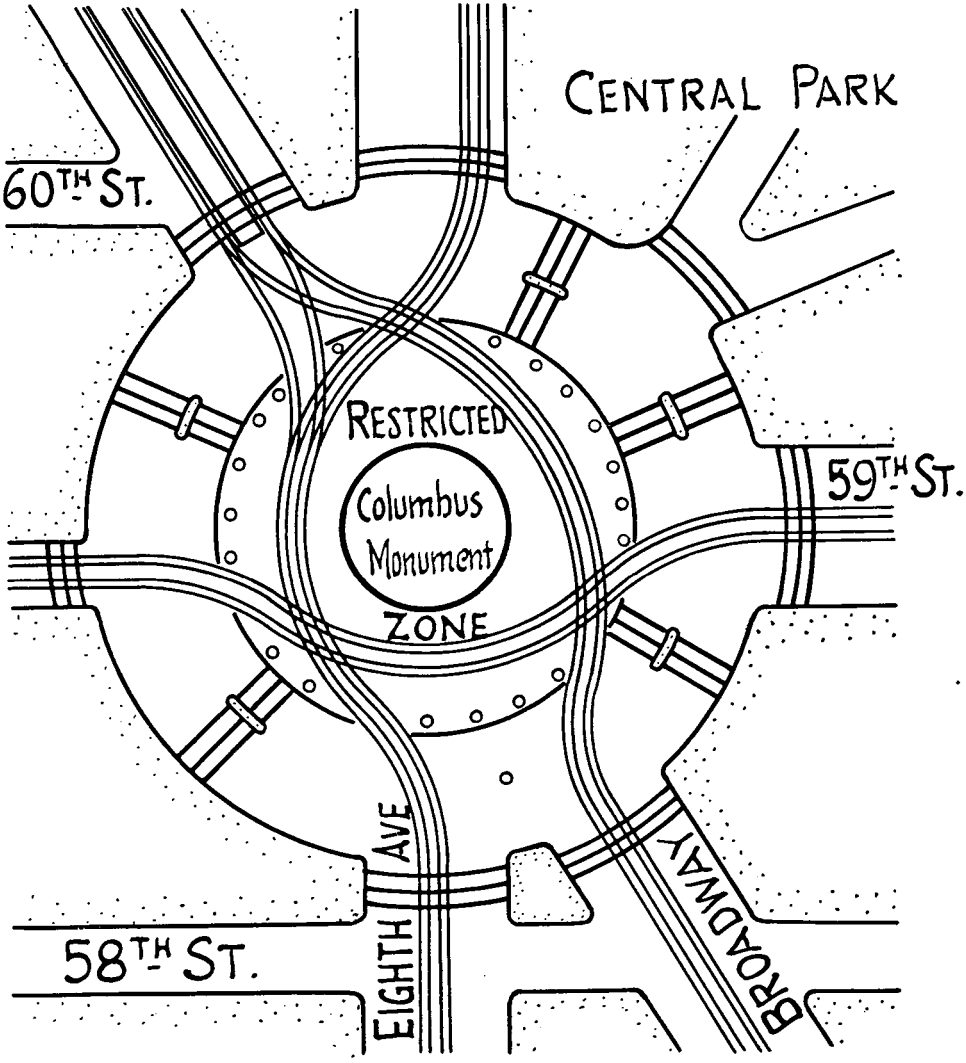
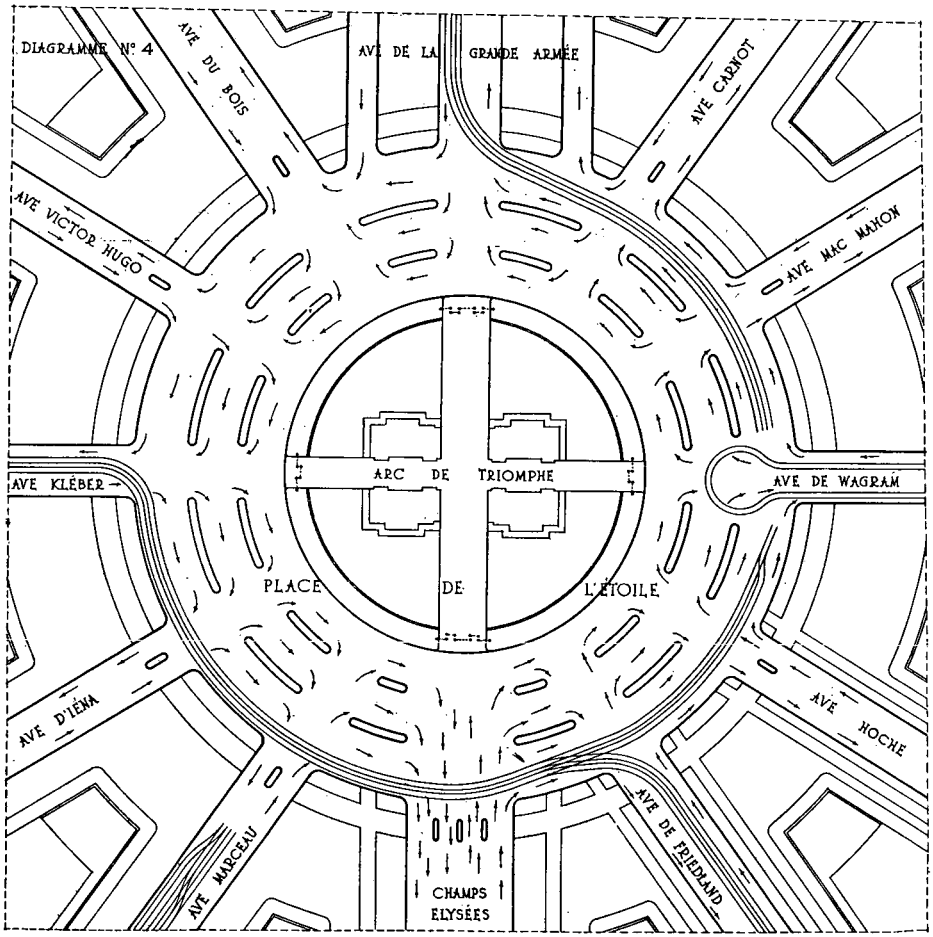


DIAGRAM 2

Improved Plan for Rotary Traffic at Columbus Circle



PLAN ROTATIF OU GYRATOIRE POUR LA PLACE DE L'ETOILE

DIAGRAM 3

Place de l'Etoile, with a dozen entering streets and three stub-end car lines. Traffic is divided into lanes all traveling in the same direction, to the right. The cut shows two lines of Safety Zones for crossing to the center circle and to canalize traffic. These Safety Zones are not yet built around the Circle, although those that were in pairs on the Champs Elysées have been spread apart, and a third one constructed between them, now dividing the central part of the Avenue into two alleys for motor cars.

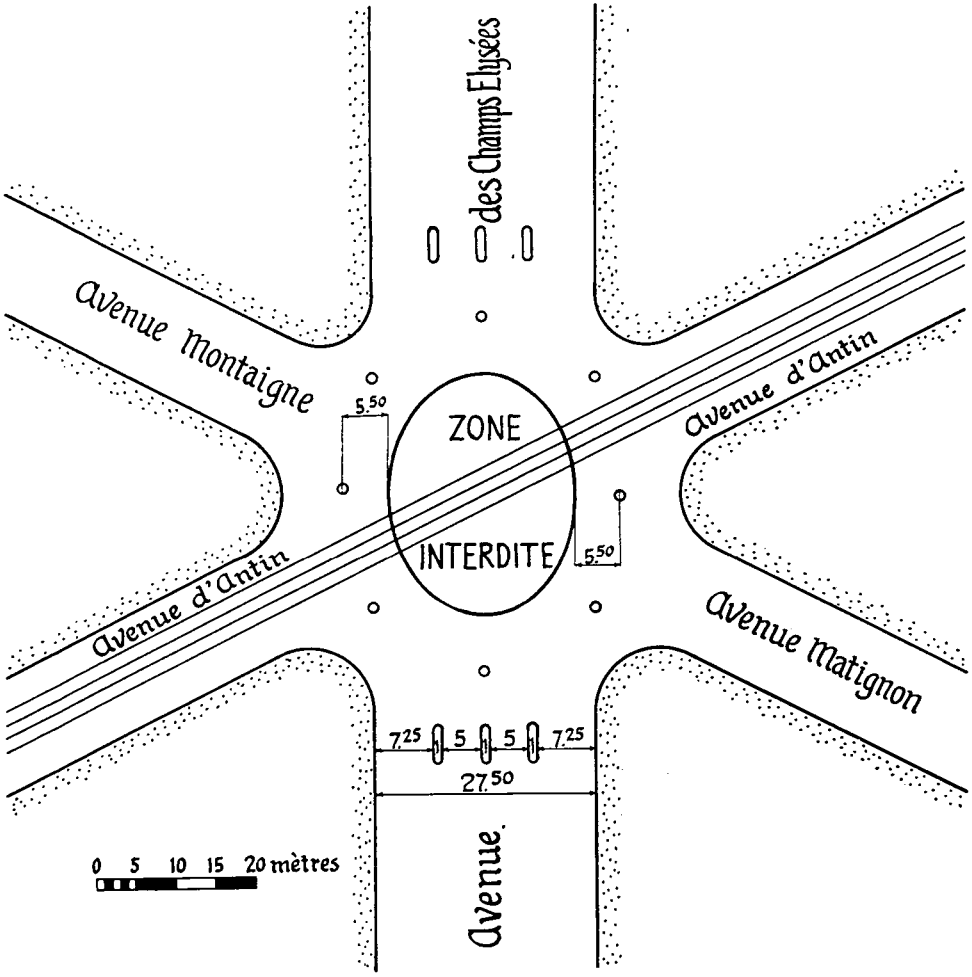


DIAGRAM 4

Proposed plan for the Rond Point on the Avenue des Champs Elysées. It is crossed by two other avenues, one of them having a street railway line. Safety zones around the ellipse serve to continue the separation of traffic and assist pedestrians.

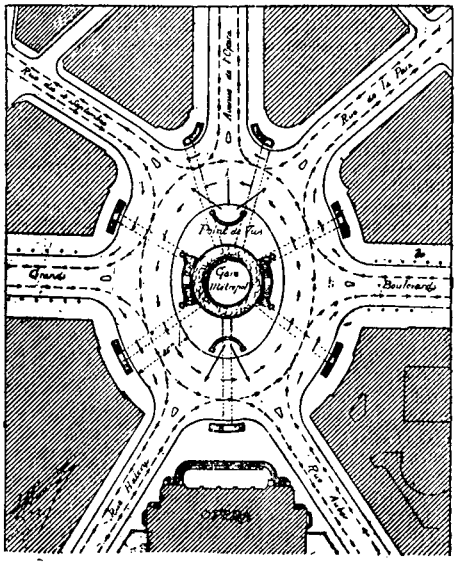


DIAGRAM 5

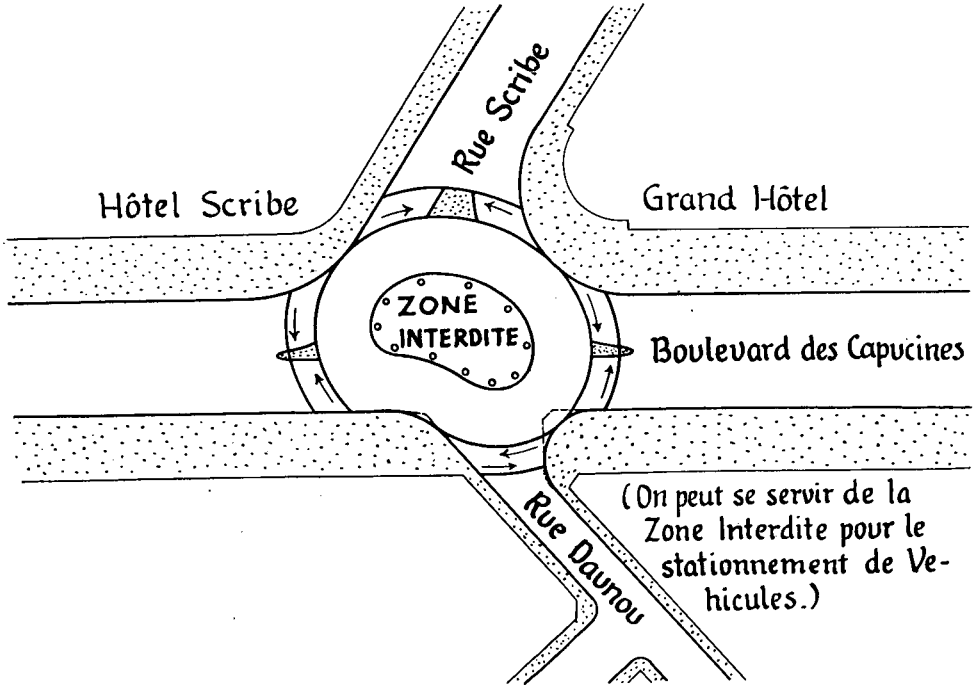


DIAGRAM 6

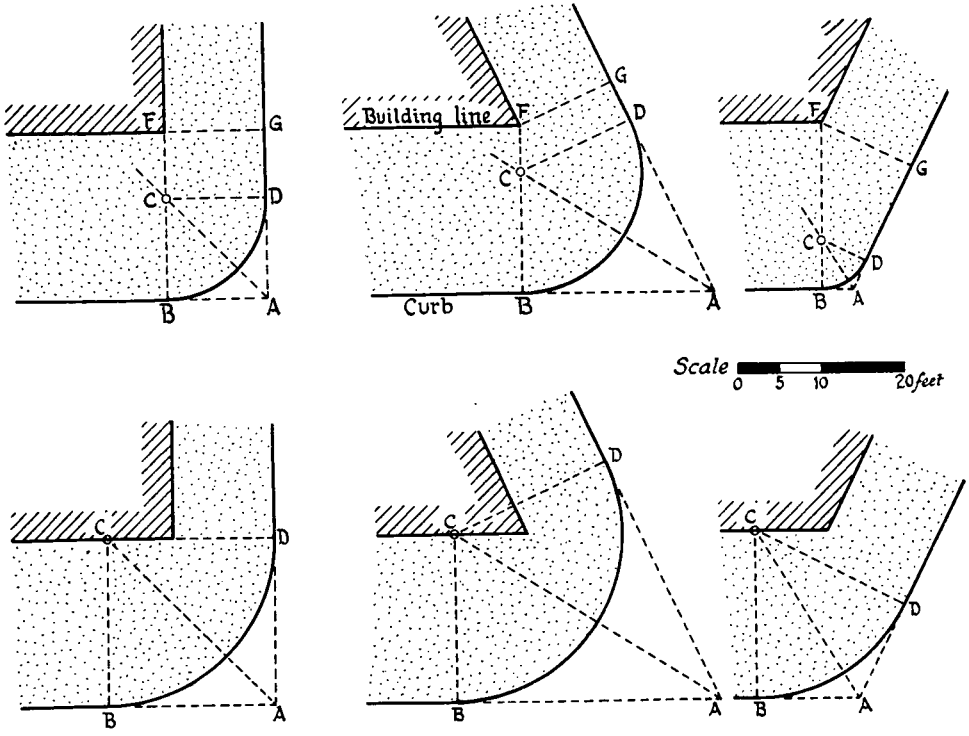


DIAGRAM 7

Diagram 6 shows rotary traffic where the rue Scribe and the rue Daunau enter the Boulevard. This is a revision of the plan given in Le Probléme de la Circulation, published in 1912.

Rotary Traffic has now been generally adopted wherever there is any intelligent effort made to handle traffic at foci of streets where there is already a circle or some similar form of central obstruction or where one can be installed. Rotary traffic, however, will work as well at an intersection of two streets where there is sufficient turning space as it will at a focus of streets. It is a no-stop system, distributing vehicles comparatively equally over the surface of the roadway instead of bunching them as does the block system. It will therefore very greatly increase the traffic capacity of the street. It is also more economical than the block system as it does not require so many traffic officers to handle it. Rotary traffic cannot function at intersections to the greatest advantage unless it extends over a considerable number of them as the operation of the block system at points that feed the spot selected for the trial interferes with the normally even flow of traffic.

At an intersection of streets, the principle to follow is exactly the same as at a focus of streets. In one case the pivotal zone to go around is large. In the other it is smaller and that is the only difference.

At a simple intersection of streets, vehicles will do exactly what they do when there is no traffic officer in charge, *i. e.*, the drivers will follow the general traffic regulation of going around the central point of intersection before turning, but with a pivotal zone in the center, they will be still further constrained to follow this rule.

The corners of streets are now not usually cut back on a large enough radius, especially if rotary traffic is to be used, six feet being about the average. The scientific radius where streets intersect at right angles is one not greater than the width of the wider sidewalk nor less than that of the narrower sidewalk. For acute angles it is greater and for obtuse angles less, the exact radius suited for any case being easily determined mathematically. (See diagram 7 and examples on p. 59.)

Diagrams 8, 9 and 10 show the usual layout and the corrected one for rotary traffic at a right angle intersection. In the example given, one roadway is sixty feet and the other thirty-six feet wide. The place selected for the illustration is Fifth Avenue at a junction of one of the narrow cross streets. The inscribed circle has a diameter of 85 feet which is liberal for rotary traffic.

The question is often asked, "How about the pedestrian in rotary traffic?" The answer is that he is much safer than where there is no system at all or where the block system is in force, for the following reasons:

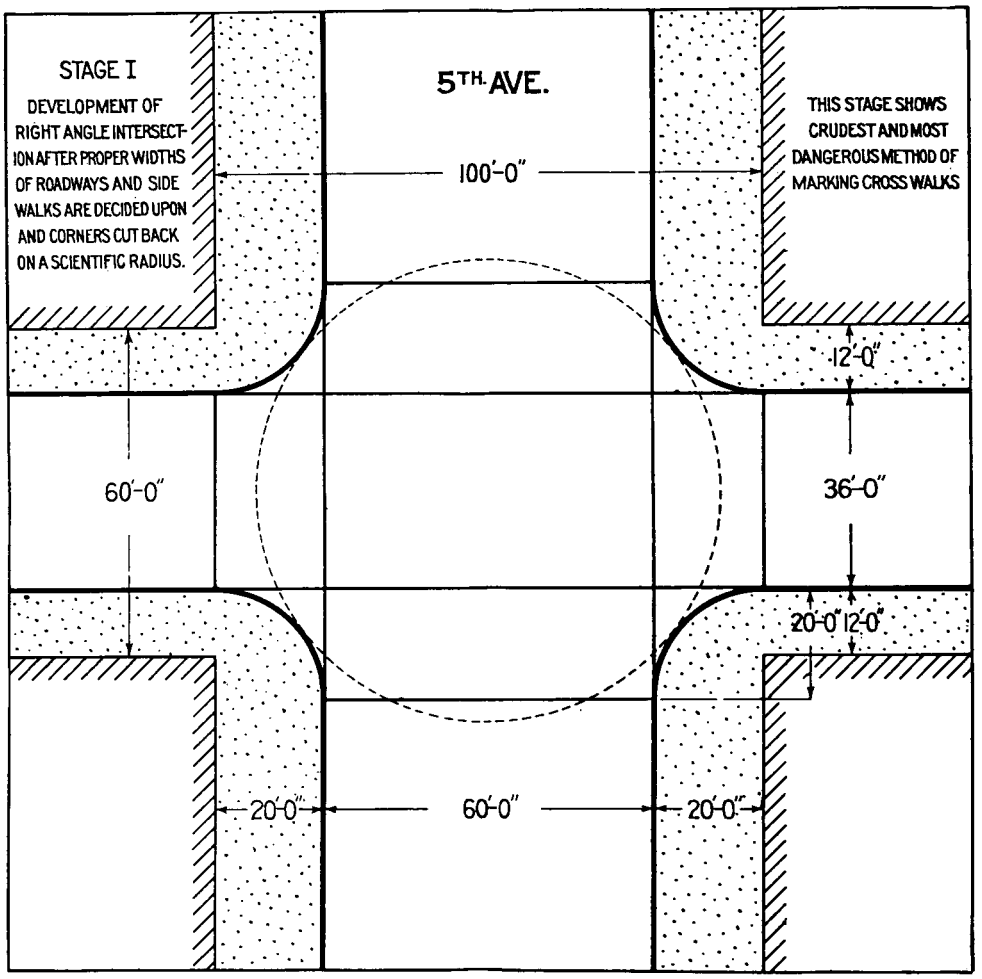

STAGE I
DEVELOPMENT OF RIGHT ANGLE INTERSECTION AFTER PROPER WIDTHS OF ROADWAYS AND SIDE WALKS ARE DECIDED UPON AND CORNERS CUT BACK ON A SCIENTIFIC RADIUS.
5TH. AVE.
100'-0"
THIS STAGE SHOWS CRUDEST AND MOST DANGEROUS METHOD OF MARKING CROSS WALKS
12'-0"
60'-0"
36'-0"
20'-0"
12'-0"
20'-0"
60'-0"
20'-0"

DIAGRAM 8

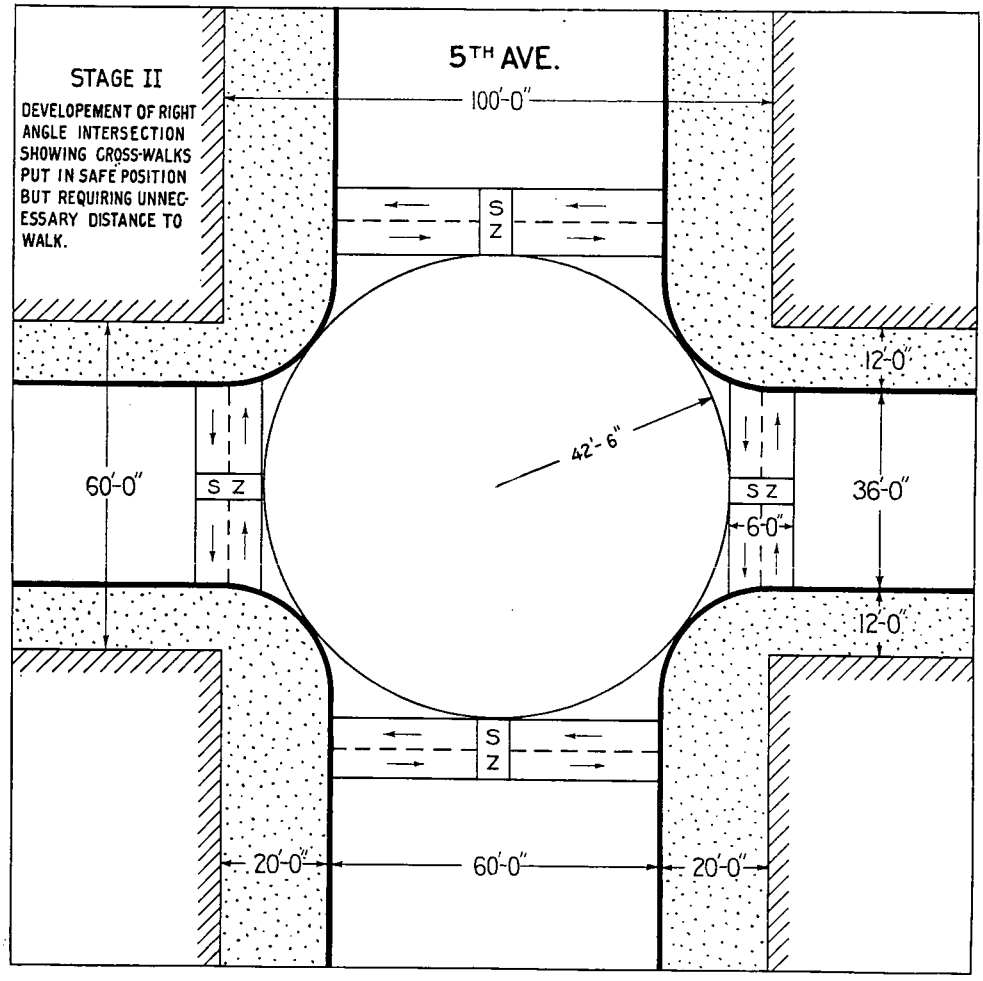

STAGE II
DEVELOPEMENT OF RIGHT ANGLE INTERSECTION SHOWING CROSS-WALKS PUT IN SAFE POSITION BUT REQUIRING UNNECESSARY DISTANCE TO WALK.
5TH AVE.
100'-0"
S Z
S Z
S Z
S Z
S Z
42'-6"
60'-0"
12'-0"
36'-0"
6'-0"
12'-0"
20'-0"
60'-0"
20'-0"

DIAGRAM 9

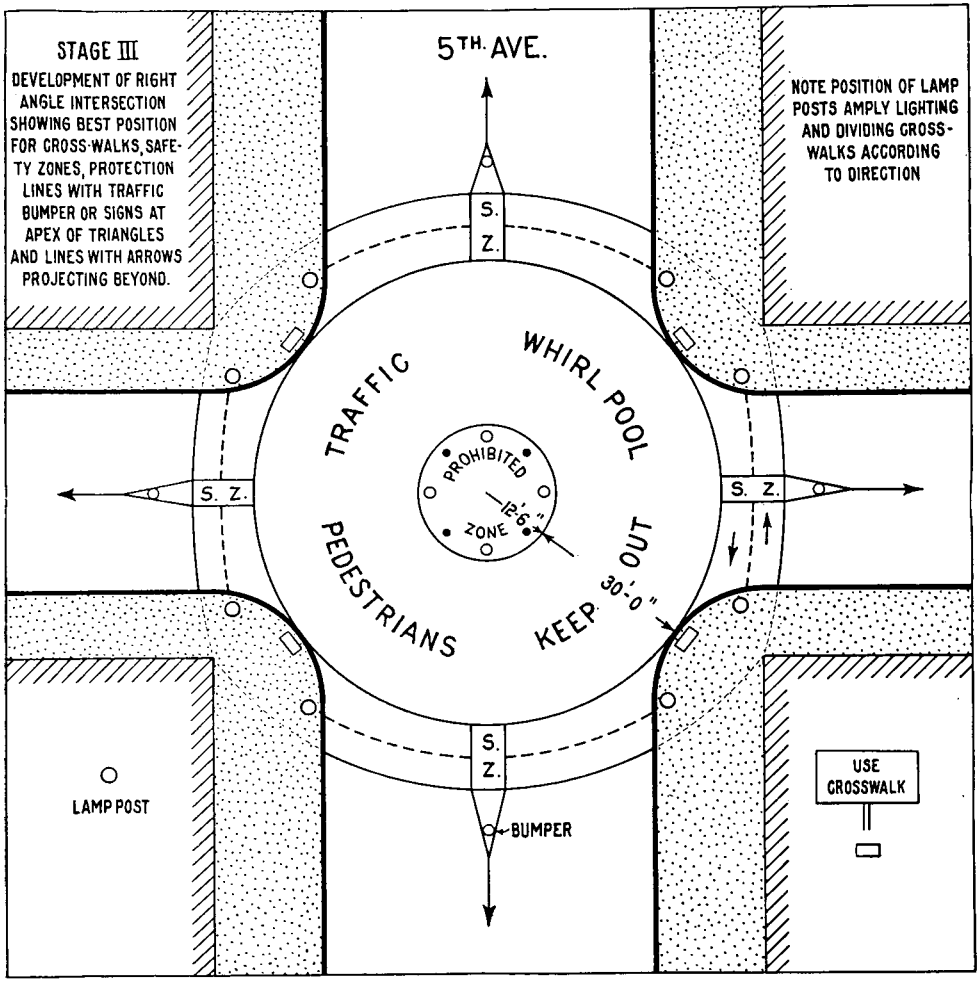

STAGE III
DEVELOPMENT OF RIGHT ANGLE INTERSECTION SHOWING BEST POSITION FOR CROSS-WALKS, SAFETY ZONES, PROTECTION LINES WITH TRAFFIC BUMPER OR SIGNS AT APEX OF TRIANGLES AND LINES WITH ARROWS PROJECTING BEYOND.
5TH. AVE.
NOTE POSITION OF LAMP POSTS AMPLY LIGHTING AND DIVIDING CROSS-WALKS ACCORDING TO DIRECTION
S. Z.
S. Z.
S. Z.
S. Z.
TRAFFIC
WHIRL POOL
PEDESTRIANS
KEEP OUT
PROHIBITED
ZONE
12'6"
30'-0"
LAMP POST
BUMPER
USE CROSSWALK

DIAGRAM 10

First, because crosswalks are, or should be, distinctly marked out and so located that they keep pedestrians from entering the traffic whirlpool at the center of the intersection.

Second, because the rotary system causes a natural slowing up of vehicles approaching the intersection, not only in order to turn safely but because Sections 2 and 3 of Article I of the General Regulations cautions them in the following words:

> Sec. 2.—Driving any vehicle when it is not under practical control, especially at crosswalks and roadway intersections or junctions.
>
> Sec. 3.—Failing to exercise due care in crossing or entering the traffic of another roadway—bearing in mind that it is obligatory not to interrupt the traffic of the more important thoroughfare unnecessarily.

Third, where the block system is in use and cars have been held up at an intersection by the adverse signal, when these cars are released, the starting speed is often excessive and consequently dangerous to pedestrians.

With the great necessity for street traffic betterment, the authorities should welcome any promising suggestion, especially that of the extension of a system which has already proven so valuable in saving life and facilitating the movement of traffic.

Traffic problems have now become too important to the people of all countries to leave them in future to be worked out by local police officers or engineers untrained in the science of traffic management. Courses in traffic regulation engineering should be increased in number and encouraged in universities in order that better talent may be induced to lend its aid. Six universities have already, at this writing, interested themselves in this subject.

The following diagrams are given as examples of what can be done by rotary traffic to solve various problems.

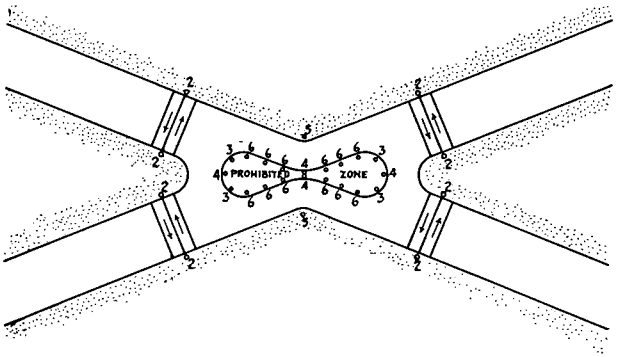


DIAGRAM 11

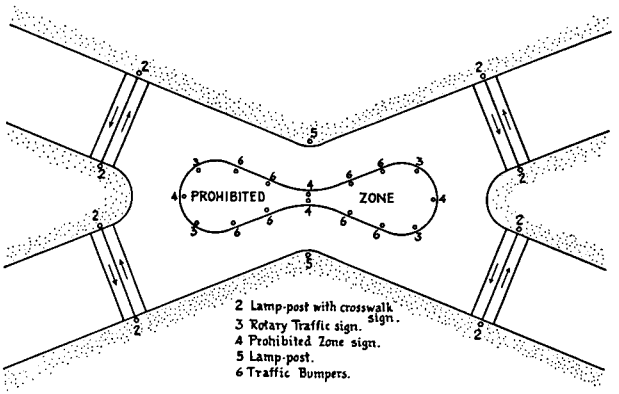


DIAGRAM 12

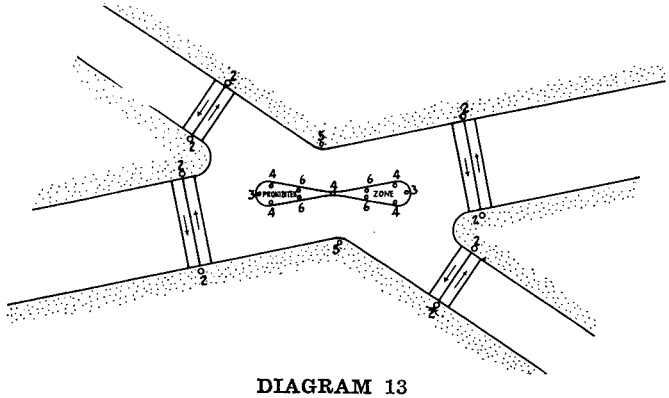


DIAGRAM 13

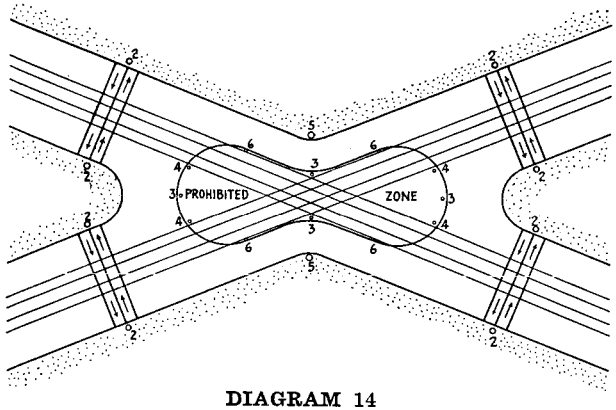


DIAGRAM 14

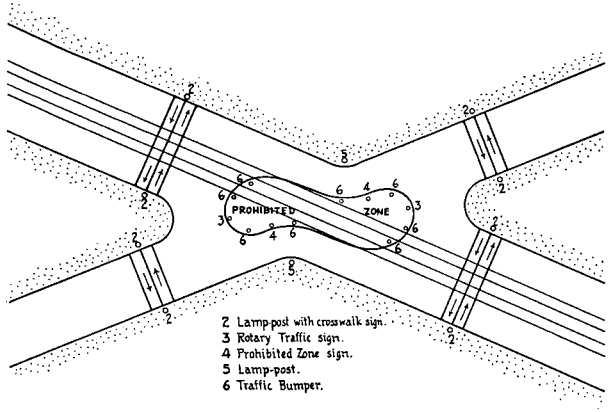


DIAGRAM 15

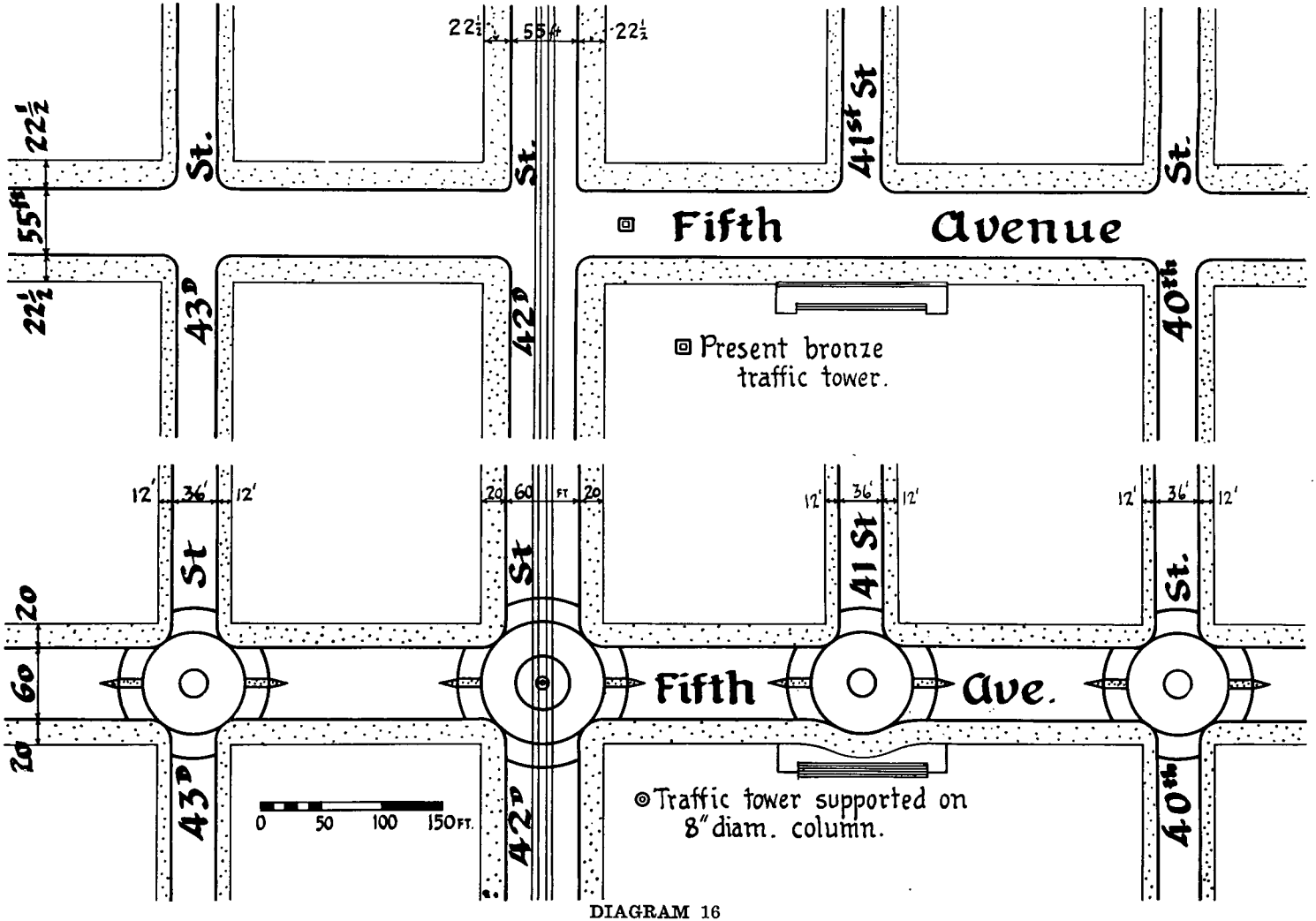


DIAGRAM 16

The upper cut shows the Avenue as it is with the Block System, and the lower cut shows how the intersection should be layed out for the rotary system.

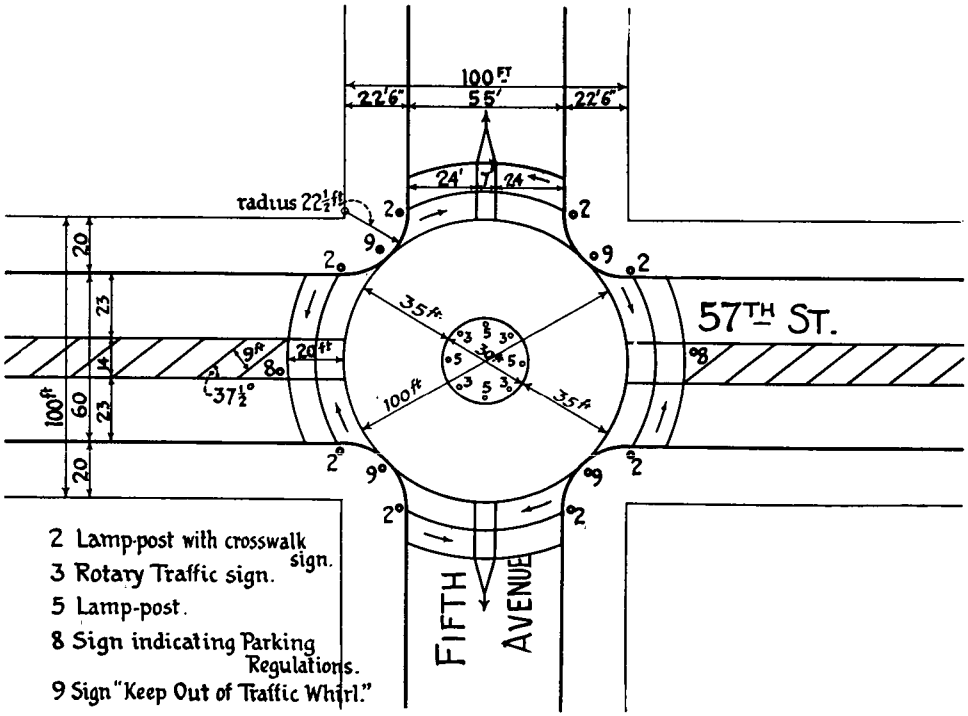

100 FT.
22'6"
55'
22'6"
24'
7
24
radius 22½ ft.
57TH ST.
FIFTH AVENUE
35 ft.
100 ft.
20 ft.
9 ft.
37½°
20
23
14
60
100 ft.
2 Lamp-post with crosswalk sign.
3 Rotary Traffic sign.
5 Lamp-post.
8 Sign indicating Parking Regulations.
9 Sign "Keep Out of Traffic Whirl."

DIAGRAM 17

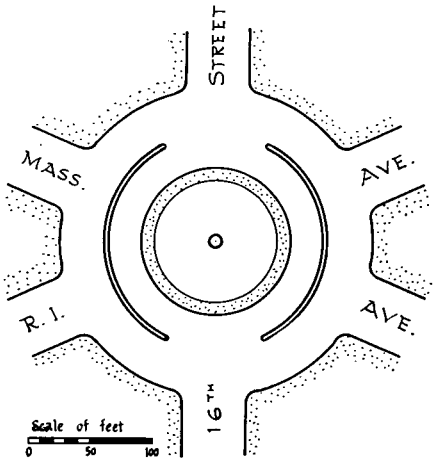


DIAGRAM 18

Presents rotary traffic layout for Scott Circle in Washington. This plan mixes up the rotary system with the block system. The crescent-shaped refuges have caused so many accidents that they have stopped putting up lamp-posts on them. (See Diagram 19.)

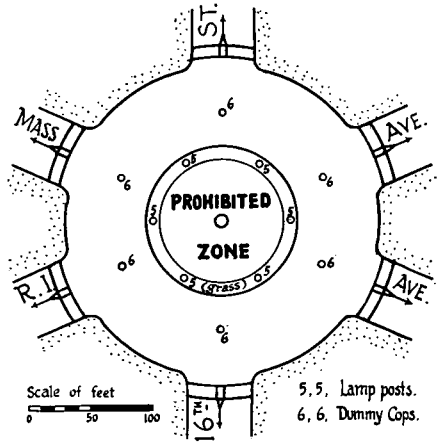


DIAGRAM 19

This plan shows the correct system of laying out rotary traffic for Scott Circle. Notice that the border of the central circle should be replaced by grass where there is now a sidewalk. Pedestrians should not attempt to cross the circle at all, but should go around it on crosswalks where shown.

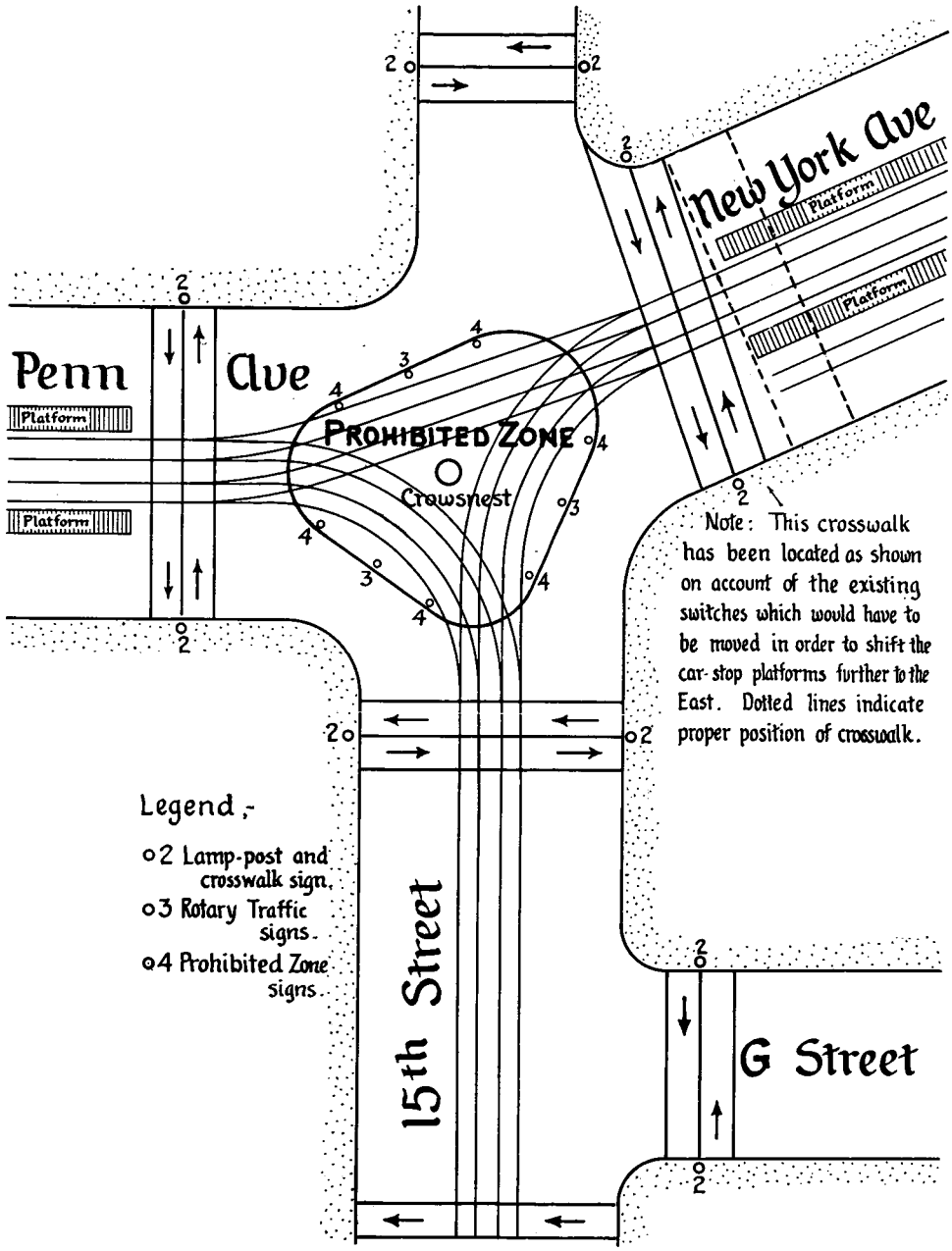


DIAGRAM 20

Rotary traffic plan for Pennsylvania Avenue, New York Avenue, and Fifteenth Street, Washington.

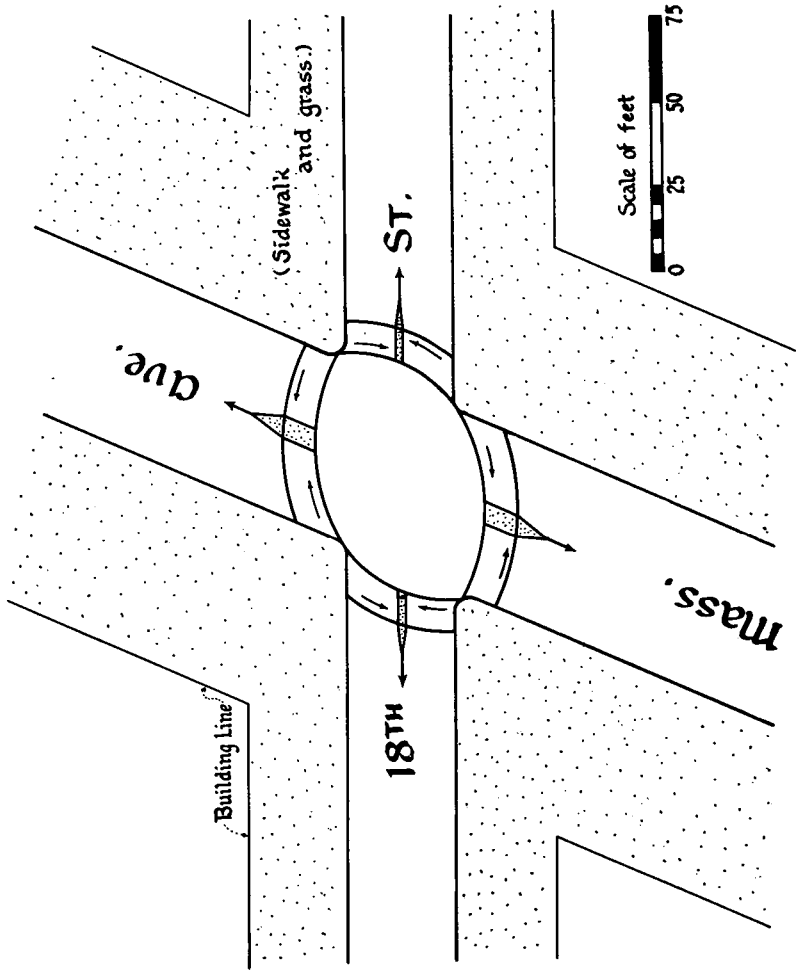


DIAGRAM 21

Shows the proper placing of crosswalks and refuges where two streets cross at acute angle.

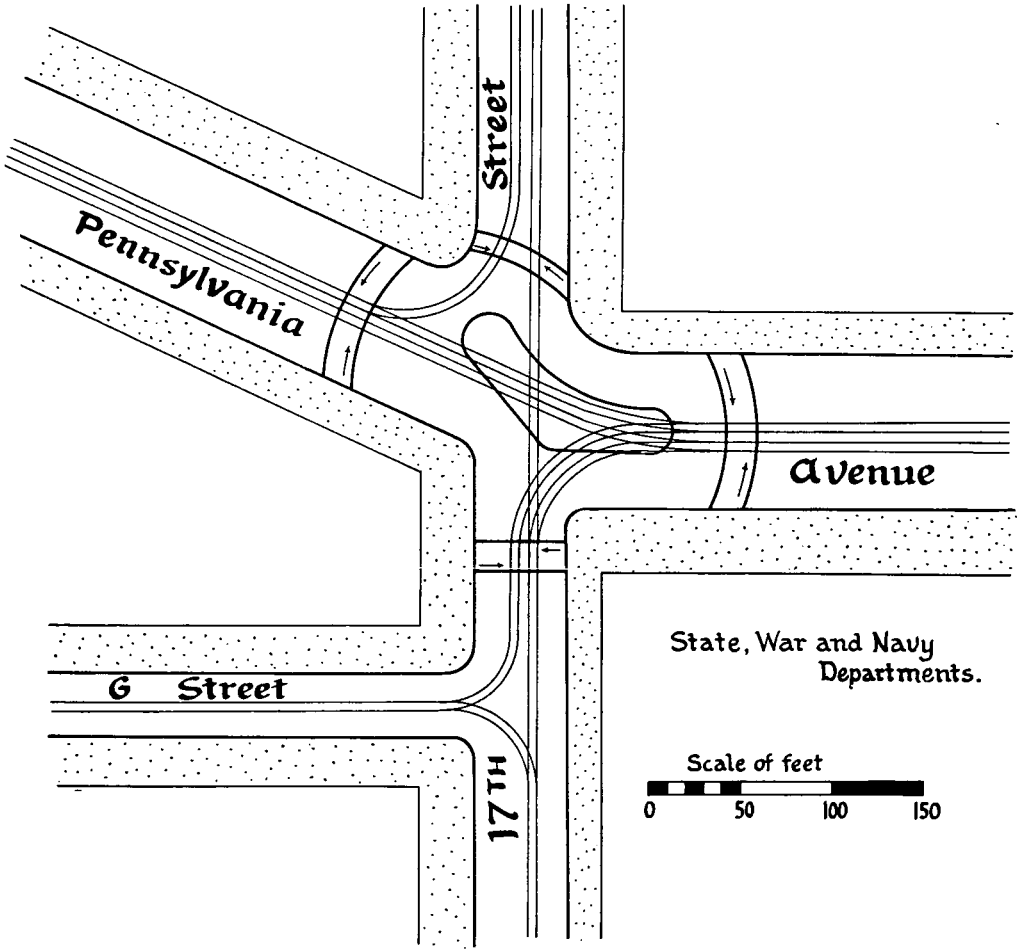


DIAGRAM 22

Shows the intersection of Pennsylvania Avenue with Seventeenth Street, Washington, adapted for rotary traffic.

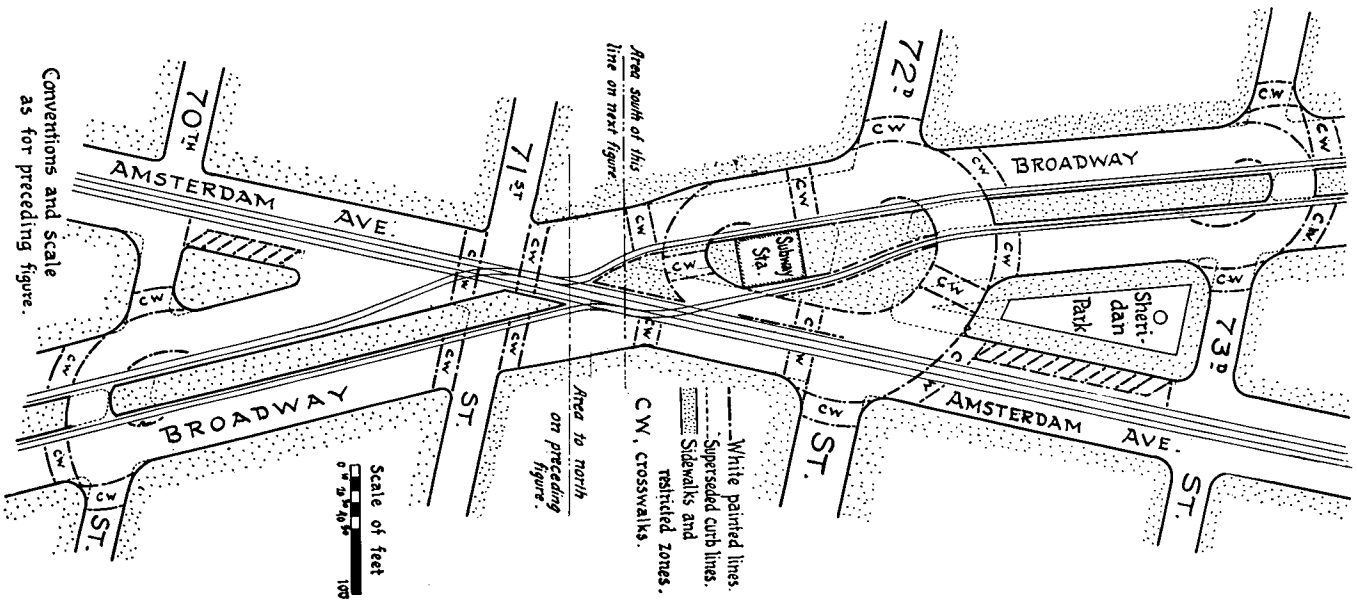


DIAGRAM 23

Shows rotary traffic adapted for the intersection of Broadway and Amsterdam Avenues from 70th to 73d Streets (New York), inclusive. This diagram is one of those made by Theodore T. McCrosky when he won the $500 prize awarded by the Eno Foundation for Highway Traffic Regulation, Inc., in 1923. He afterwards used his essay as a thesis to gain a scholarship at Louvain, and having spent a year of study there, returned to America, and is now again devoting part of his time to the teaching of engineering and mechanics at Yale University, and part of his time to work on traffic for the Eno Foundation.

CHAPTER 4

ELIMINATION OF THE LEFT HAND TURN[1]

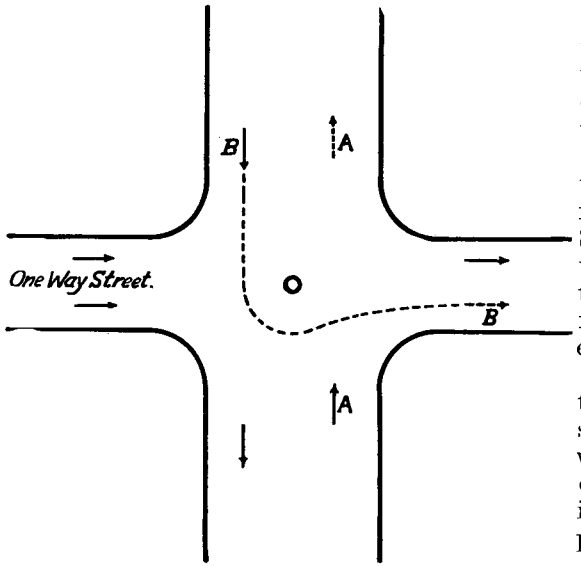


DIAGRAM 24

Elimination of the left hand turn is in use in many places where its advantages are much overbalanced by its disadvantages.

Elimination of the left hand turn in New York on Fifth Avenue at 34th Street and 42d Street, for instance, does not warrant its retention. These two places are cited as they are familiar to so many and it is easy to study them there.

Elimination of the left hand turn is one of the several measures which are being adopted without sufficient consideration, often with much unnecessary inconvenience to the driving public.

Especial attention is now called to this in order that the system may be estimated at its true value. There are just a few places where it is excusable and those are usually where a One-Way traffic street intersects or joins the main thoroughfare from the left hand side. At such places there is a reasonable excuse for the elimination of the left hand turn since it prevents only the turning back of vehicles on themselves at the particular intersection where the system is used.

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[1] In December, 1914, it was proposed to the Police Department of New York to adopt the elimination of the left hand turn from 26th to 58th Streets, inclusive. Representatives of the Fifth Avenue Association attended a meeting at the Police Department to lodge their protests. One example of what the elimination of the left hand turn would effect, killed the proposal, although it has come up again from time to time but in a lesser degree and where the damage is not as serious. The example given was of a vehicle coming down Fifth Avenue and wishing to stop on the east side of the avenue just below 42d Street. In order to accomplish this feat it would have had to turn to the right hand on 42d Street, go over to Sixth Avenue, make one left hand turn there, go down Sixth Avenue to 40th Street and make another left hand turn there, then proceed through 40th Street to Fifth Avenue, and make another left hand turn there and then proceed up to the point just below 42d Street. Therefore, to avoid one left hand turn on Fifth Avenue, the vehicle would have to make two left hand turns on Sixth Avenue and then another one when it got back to Fifth Avenue at 40th Street, but this one according to the arguments of the other side, did not constitute a left hand turn on Fifth Avenue because the vehicle was first going along 40th Street and then turning into Fifth Avenue instead of the opposite—going along Fifth Avenue and then turning into 40th Street.

CHAPTER 5

SEGREGATED STREET TRAFFIC

It took a long time for the Police Department of New York to realize that it had authority to exclude traffic of any special kind from any special street. This was first conveyed to it by attention being called to Section 315 of the New York City Charter. The realization of this power was a step in advance, but this authority should be used with great discretion and only after careful study of the local situation.

It is not at all necessary or advisable to exclude light traffic (and by this I refer not only to light passenger vehicles but to light delivery wagons, or to any other light, fast moving vehicles which do not obstruct traffic on account of their slow pace) from any street. All vehicles, however, when moving slowly should be forced to keep near the right hand curb.

On some important shopping streets, such as Fifth and Madison Avenues, heavy, slow-moving vehicles should be excluded, except for a limited distance for the purpose of loading or unloading, during congested hours, and cruising cabs should be obliged to move briskly when in the stream of traffic in order not to impede following vehicles.

Cruising cabs should, however, not only be obliged to move quickly when on a congested street, but should be obliged to limit the distance they travel on such a street when not carrying fares. A sufficient number of well-located cab-stands will tend to simplify the situation.

CHAPTER 6

THROUGH TRAFFIC STREETS

Through traffic streets or boulevards in a city should not exist on the same level as that of the other streets because the greater speed for which they are intended and the necessary restrictions in regard to cross traffic interferes so much with the general traffic of the city and slows it down to such an extent that the balance of advantage against them is greater than any argument for them.

There are cases, however, where through traffic streets would be of great advantage, but these are only where the levels can be separated—for instance, if an elevated traffic road could be placed over Park Avenue to 45th Street and then around both sides of the Grand Central Station and down over Fourth Avenue to 17th Street, it would be of great advantage in delivering through traffic down the Island to that point, where on coming from the elevated struc-

ture, it would distribute itself below that point over the Island. There should, of course, be ramps down, say at 42d, 72d, 84th and 96th Streets. From that point up and across the Harlem River, this roadway could continue over the surface street and on a superstructure of the railroad bridge on up to some point beyond the Harlem River, although a better plan still would be to dip the railroad down under the Harlem River, using the present railroad bridge for a normal grade of traffic and a superstructure over it for the through street. By this arrangement, a rate of speed such as that used on suburban streets could be allowed with safety, although it is a question whether more than twenty miles an hour would be desirable even there, because less traffic could be handled over the road when it is crowded than at a lesser speed rate. (See Chapter 7 on Speed.)

CHAPTER 7

SPEED AND ITS RELATION TO RECKLESS DRIVING

What is to be Desired is Not to Increase the Speed Rate, but to Reduce the Time Required to Cover Distance

Long before and even for years after the study of traffic regulation was begun in New York in 1899, a speed rate exceeding eight miles an hour on city streets and in parks was prohibited by law. Now vehicles exceed that speed rate by three or four times in many cities and parks without molestation and frequently the police hurry drivers on to even greater speed, often at the risk of disastrous results.

On roads outside cities, motor cars go still faster and from at least one State comes the report that the law exacts that vehicles shall maintain a speed of thirty-five miles per hour or get off the road. Such a law must be due to either speed mania or to the mistaken idea that more traffic can be passed over a road with a high speed rate than with a low one. The opposite is, however, the case. Such experiments as have been made tend to show that when a roadway is crowded more vehicles can be passed over it at not exceeding fifteen miles per hour than at a higher speed rate. This is because as the speed rate increases, the distance between vehicles also has to be increased very greatly to maintain approximately equal safety. See "Elements Governing the Development of Highway Traffic," by Dean A. N. Johnson, M. Am. Soc. C. E., published in "Proceedings of the American Society of Civil Engineers," May, 1925, pp. 752-3-4-5.

Of course, anyone will admit that the faster a vehicle goes the less time it will take it to cover a given distance. As the number of vehicles increases on a road, however, the speed rate should be reduced to, or at least towards, one which will pass the number of vehicles then on a road over it in the shortest time. If we can believe the result of experiments this speed rate is about fifteen

miles per hour when the roadway is full and vehicles are traveling in lines, one behind the other. According to this, therefore, the maximum speed ought to be somewhere between fifteen miles an hour and the rate at which one vehicle would cover the greatest distance in the least time, it being assumed that no reasonable person would care to drive over forty-five miles an hour under any circumstances. If this be so, the average between fifteen and forty-five, or thirty miles per hour, might be accepted as the extreme limit of speed to be considered legally outside of cities. In cities, however, this rate should be much reduced on account of safety as well as on account of conserving the road capacity, since, as already stated, fifteen miles per hour will pass more vehicles over a given distance when the traffic is heavy than will a faster rate.

Assuming that twenty miles per hour should be the maximum speed on city streets, public parks and parkways and that this rate should be reduced at intersections and crosswalks to half that, or ten miles an hour, then vehicles could probably average about fifteen miles per hour on city streets under ordinary conditions unless slowed down by the effects of a synchronized block system.

Any municipality or township should have the right to still further limit the speed rate at any place within city or town boundaries to a lesser speed rate when some local danger makes it urgent to insure safety but perhaps only with the approval of the proper state authorities.

There is undoubtedly a great difference in the skill of drivers to drive safely at a high rate of speed. There is also a great difference in the natural time of reaction of drivers to respond to warnings of danger, especially as examinations for permits and licenses to drive are still so lacking in strictness in mental, physical and road tests. In determining permitted speed rates, we should therefore have in view not the ability of the most skillful but that of the least skillful who are permitted by law to drive. Then again, although many of the newer motor cars are made so that they can be stopped more quickly than the older ones, we must not be governed by the best but by the worst cars that are allowed to travel on the highways. The invention of four-wheel brakes is urged by automobile manufacturers as a reason for being permitted to drive faster than before, but four-wheel brakes are not altogether a safety device for while they undoubtedly enable a car to stop quicker than it could without them, the very quickness with which the car stops creates a danger not only to itself but to following vehicles because of the increased liability to collision.

The following is taken from one of a series of articles written for the Sunday newspapers of the State of Connecticut by the Commissioner of Motor Vehicles of that State (see document Series Number 14, published by the Motor Vehicle Department of the State of Connecticut):

"Speeding, where nothing happens as a result from it, is not in itself so serious an offense as cutting in and out of traffic in bad locations and making a lot of trouble for others by putting them into difficult situations, but it does contribute to danger in almost every instance. Speeding as well as every other form of unexpected and unusual driving, creates complications which others are not prepared to meet, and often contributes to accidents of which the person who is actually doing the speeding knows nothing, either then or afterwards. It is not unusual to see a speeder drive two or three cars, which are operated by rather timid or cautious persons, out of the road without his having even been conscious of the fact. Therefore, it is necessary and proper to down fast speeding and to enforce against it as a part of the reckless driving statute."

Taking into consideration the foregoing arguments, I suggest the following regulation against reckless driving, of which speeding is perhaps the most important feature:

Reckless driving is unlawful and includes:

Section 1. Driving any vehicle when not legally qualified to do so or when intoxicated, or when for any other reason not competent to drive properly.

Sec. 2. Driving any vehicle when it is not under practical control, especially at crosswalks and roadway intersections or junctions.

Sec. 3. Failing to exercise due care in crossing or entering the traffic of another roadway—bearing in mind that it is obligatory not to interrupt the traffic of the more important thoroughfare unnecessarily.

Sec. 4. Exceeding a reasonable, considerate and safe speed rate under existing conditions or the speed rate established by law.

Sec. 5. Violating any of the regulations so as to cause danger or failing to take every reasonable precaution for safety or to obey any order of a traffic officer or any direction indicated by official traffic sign, semaphore, signal light or limit line.

Sec. 6. Exceeding a speed rate of

20 miles an hour in city streets, public parks and parkways, slowing down to not exceeding 10 miles before reaching crosswalks, roadway intersections or junctions;

30 miles an hour on country roads, slowing down to not exceeding 15 miles before reaching crosswalks, roadway intersections, junctions or trolley tracks ahead or where there is not a sufficiently clear view ahead to insure safety, especially on curves and when approaching a hill crest;

15 miles an hour when within 200 feet of a railroad ahead, slowing down to not exceeding 10 miles an hour at 100 feet;

shall be considered *prima facie* evidence of reckless driving.

Any municipality or township shall have the right to still further limit the speed rate by a sign at any place within city or village boundaries to a lesser speed rate when some local danger makes it urgent to insure safety but by consent only of the proper state authorities.

Another question which is worthy of consideration is: While it is necessary for the sake of safety to make certain regulations as to speed rates, there are times and places when and where it would not endanger anyone for a vehicle to go faster. For instance, a road may be amply wide, with no other roads crossing or entering it; then if a motor vehicle is well made and in good order and the driver is a competent one, a little greater speed would not actually constitute reckless driving. I would advise, therefore, that some discretion be left to the police as to arrests up to thirty-five miles per hour.

The serious delays on roads due to heavy motor trucks or other vehicles which have not sufficient power to negotiate hills at a reasonable speed rate should lead to a regulation that should require them to have power enough in reserve to enable them when loaded to take any reasonable grade which they are apt to meet at a speed rate of not less than fifteen miles per hour. Such a regulation would add much to the traffic capacity of the road.

The terrible cost in life, human suffering and money caused by traffic accidents (see Chapter 9, p. 93) demands that the speed craze be curbed by common sense and through strict enforcement of reasonable regulations. I wonder what proportion of motorists who are using the roads at any one time are really going to any distant point which it is necessary to reach in a hurry. Are not most of the motorists either going to some place rather near or else out for a pleasure ride, and would not these people, at least, be just as well accommodated by going a mile in three minutes as at a greater speed?

Although only a certain percentage of traffic accidents is due solely to speed, almost every traffic accident is worse in proportion to the speed at which one or more vehicles are going when the accident happens.

CHAPTER 8

THE STORING OR GARAGING OF DEAD VEHICLES ON ROADWAYS

Revised and reprinted from The Annals of the American Academy of Political and Social Sciences, Philadelphia, November, 1924.
Publication No. 1826.

By WILLIAM P. ENO
Chairman of the Board of Directors, Eno Foundation for Highway Traffic Regulation, Inc.

This discussion has to do with what is often inaccurately termed "The Parking Question."

Much of the difficulty we are now experiencing through the storage of waiting vehicles on roadways is due to the fact that we have not discriminated between the terms "to rank" and "to park" or between "live" and "dead" vehicles. We must get these differences straight in our minds before we can intelligently attempt to bring about better conditions. The terms "to rank" and "to park," while applicable to both live and dead vehicles, relate only to their relative positions to one another and to the curb. The definitions are:

"To Rank—To stand vehicles one behind the other parallel to curb."

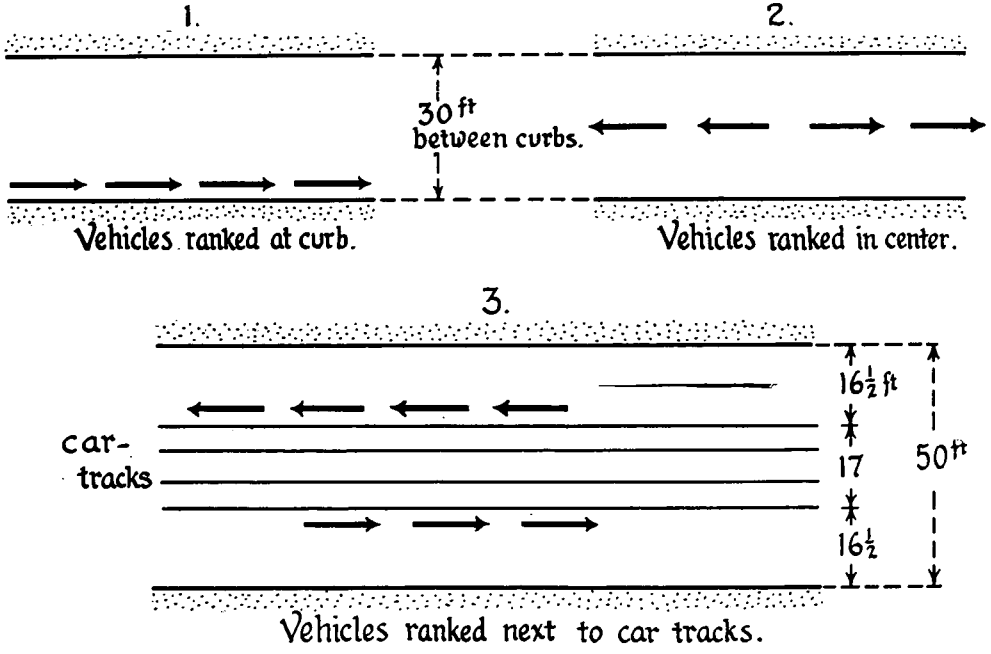

DIAGRAM 25

"To Park—To stand vehicles parallel to one another at an angle to curb."

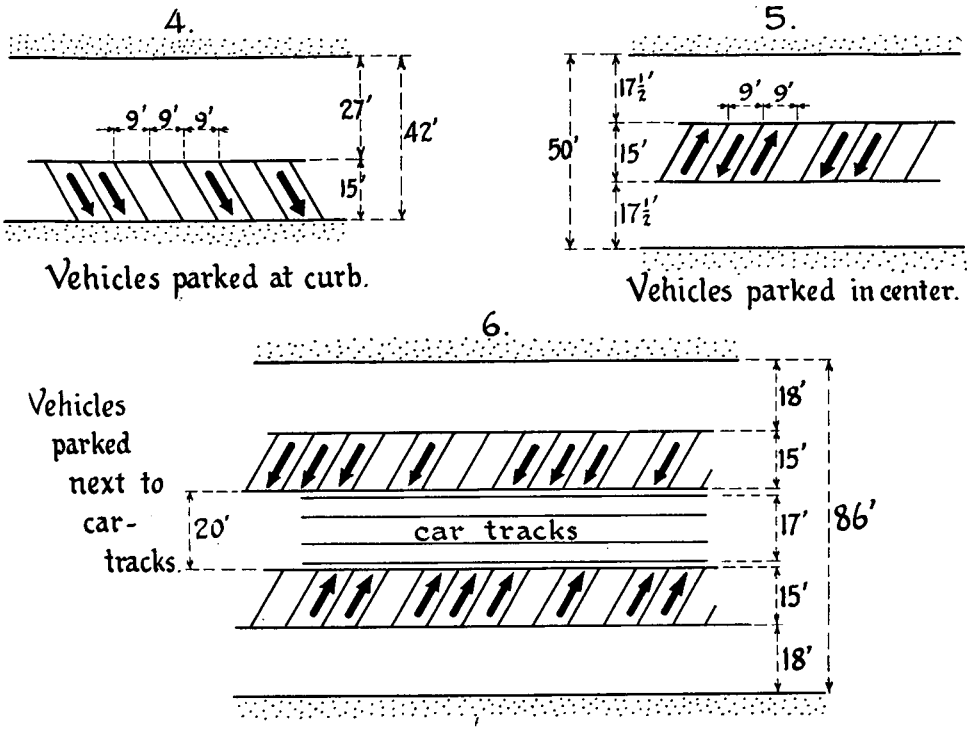

DIAGRAM 26

The term "to rank" is derived from the term "cab rank," as used for generations in London, where cabs are placed on stands one behind the other in file, and the term "to park" from the practice of placing gun carriages parallel to one another, in which position they are said to be parked. It is therefore clear that the terms "to rank" and "to park" are not synonymous, but that there is a practical and important difference between the two.

In regulating ranking or parking, we must divide vehicles into "live" vehicles and "dead" vehicles. The definitions are:

"Live Vehicle," one whose driver is present and prepared to move vehicle;

"Dead Vehicle," one whose driver is absent or unable to move vehicle.

When vehicles are ranked, no one of them can move out of the line independently of the others, unless considerable waste space is allowed for between them, whereas when they are parked, being parallel to one another, any one of them can get away without causing any other one to move.

Live vehicles do not give any unreasonable annoyance or cause a serious fire hazard if the Council of National Defense (C. N. D.) Code of General Highway Traffic Regulations is in effect. Dead vehicles, however, constitute not only great inconvenience to the general public and injury to business, but a veritable menace likely to result in uncontrollable conflagrations because fire apparatus cannot reach its destination promptly.

In considering the question of ranking and parking we should take into account the requirements of Article III of the C. N. D. Code of General Highway Traffic Regulations as follows (see pp. 11 to 16, inc.):

Any further control, where necessary, should be brought about through special regulation by the use of such traffic guides as lines on the pavement and properly designed clearly worded signs.

One of the effects of the enforcement of Sections 8 and 9 of Article III will be that vacant lots will be leased to store waiting vehicles and it will become profitable to construct public garages where cars can be left during the day when people are attending to their business and during the evening when they are at the theater. Some of these storage places will undoubtedly be in the congested parts of cities and others a little way out where people will leave their vehicles and proceed to their destination by street car, bus or taxi. This latter will be the case, I believe, in some of our congested cities such as New York, where it does not really pay to go downtown in private cars.

No part of the code has had a more careful study by more people than Article III. The considerations involved are complicated because it is difficult to preserve the rights of all and at the same time refrain from imposing more restrictions on any one than is absolutely necessary. We must, therefore, count upon intelligent police discretion, and the education and respect for fair play of the public for cooperation.

There is no reason why a vehicle should not rank or park anywhere, provided that in so doing it does not unreasonably restrict the rights of others. See Sections 1 and 9 of Article III.

Section 9 requires that the driver of the waiting vehicle be ready to pull out immediately on the approach of an arriving vehicle. Such strictness as this implies is absolutely necessary on roadways where the importance of getting to the curb is paramount, as, for instance, on roadways devoted to retail trade, and to a slighter degree on those devoted to residences. Where wholesale business predominates, the necessity of allowing sufficient time to load or unload has to be adequately considered.

In enforcing the provisions of Article III, it should be remarked that a vehicle, either ranked or parked, when not in the way of moving traffic, should

not be compelled to enter it again until another vehicle comes to take its place. It is a case where the old adage, "Let sleeping dogs lie," applies. It is clear that while this provision of the code should be enforced strictly when congestion exists, it need not be so strictly insisted upon when congestion does not exist. Of course, every driver, out of common decency, should refrain from leaving his vehicle where it will block access to the door of an occupied building.

General Ranking and Parking Spaces

There are many spaces which can be used for ranking and parking without interfering with the flow of traffic on the roadway. These should be regarded as general ranking or parking spaces. (See Section 1 of Article III.)

Ranking and parking spaces are better marked out by paint limit lines, but whether marked or not marked, they should be free for vehicles to rank or park in. Among such spaces are those alongside parks, vacant lots, public and vacant buildings and buildings where the doors or entrances are not in regular use. Briefly, these spaces may be defined as all those not in front of a regularly used entrance to a building or to a transportation station.

No private signs prohibiting ranking or parking should be allowed, but the Police Department should furnish signs on application by property owners if the reason given is adequate. All signs, like everything else in traffic, should be standardized. The signs for stationary vehicles, designating ranking or parking spaces, cab-stands, cars and bus stops are known as information signs, and should have black letters on a vivid yellow background.

The economy of room for waiting vehicles as well as for moving vehicles on many congested roadways is so important that it is well worth while to define by paint lines every such space that can be used to hold one or more vehicles.

Special Ranking and Parking Spaces

Besides the general ranking and parking spaces already described, there are others, especially adapted to provide for waiting vehicles. Some of these are in the center of streets; some, in very wide streets, are next the car tracks, and others are where streets come together at acute angles. These spaces are often of irregular shapes, filling space not required for lines of moving vehicles. It is of the utmost importance that *all such available spaces in the congested parts of cities be scientifically marked* with paint limit lines or be paved with a different kind of pavement from the rest of the roadway and furnished with signs with the words, "Public Ranking Space" or "Public Parking Space," as is best

adapted to the local possibilities. In these spaces vehicles should usually be allowed to remain unless at certain hours it is necessary to limit their time, when the sign should have on it such additional wording, as, for instance, "30 Minutes from 3 to 7 P.M."

Parking spaces should have stalls not less than 7½ feet or more than 8½ feet wide for vehicles marked by paint lines. Stalls for trucks, sight-seeing vehicles, etc., should be wider.

Vehicles should be parked at an angle to the curb of 90 degrees, 45 degrees, 37½ degrees or 30 degrees, as is best adapted for local conditions. The width of a parking space located in the middle of a street where vehicles are to be parked at an angle of

90° should be at least 15′
45° should be at least 15′
37½° should be at least 14′
30° should be at least 13′

When the parking space is next to the curb, these widths can be reduced one foot each, respectively, as a portion of each vehicle can project over the curb about that much.

Vehicles should never be parked at an angle of 90 degrees to the curb, except in certain locations, when waiting for the termination of the races, theater, etc., or when loading or unloading merchandise, and in some instances on cab stands. In parking at an angle of 90 degrees to the curb, it is apparent that to get into a stall in the parking space will very often necessitate backing once or even several times.

When vehicles park, unless waiting for the termination of some gathering, they should drive directly into their stalls and back out when ready to leave. This method will avoid seriously retarding other traffic if the time chosen to back out is when there is a slight let-up in traffic.

If the opposite is done, *i. e.*, passing the stall to be occupied and backing into it, it must always retard the vehicles which are directly behind.

Ranking spaces in the middle of a street should have the side lines six feet apart. If at the curb, one line six feet from the curb should be used.

Some streets are wide enough to park on both sides and allow the necessary room for moving vehicles in the center. Others can have vehicles parked on one side and ranked on the other, provided room is left for moving vehicles.

In one-way traffic streets, if a parking space is to be marked on one or both sides, the stall lines should slant towards the approach of traffic.

Cab, Hack, Truck and Sight-Seeing Vehicle Stands

Cab, hack, truck and sight-seeing vehicle stands should be marked by signs giving the number of such vehicles each stand is intended for. The vehicles should be *ranked* usually in the middle of the roadway or next the curb, as best suits each locality. There are, however, a considerable number of places where vehicles can be *parked* advantageously either in the middle of the roadway or at the curb. At such places an angle of 90 degrees is ordinarily to be preferred, as it best enables such vehicles to leave the parking space so as to proceed in either direction with equal facility. However, this is not always the case. Sometimes such stands are located in the center of the roadway, where, if *other* vehicles are *ranked* at the curb, there is not sufficient room for entering or leaving the stand to join in with the moving traffic without manœuvering by backing and thus impeding it. In this case an angle of 45, 37½ or 30 degrees should be substituted.

When *parked* at the curb, public vehicles should be backed into the parking space so as to be ready to drive directly out into the traffic when leaving. *This latter method is exactly opposite to what is advised for usual parking purposes.*

The greatest opposition which we shall have to my recommendations will be from owners of cars who have no chauffeurs, who will claim that class legislation is being proposed, whereas it is *they* who desire class legislation because what they want to do is to leave their cars where they will be a nuisance and a menace. This should not be permitted under any circumstances—whether they have chauffeurs or not. It is not a question of chauffeur but one of nuisance and menace.

Surely conveyances, such as street cars, buses and taxicabs, which are available to the general public, should have precedence, if necessary, over those for private use only, but we do not permit these to stand indefinitely where they would be a nuisance and a menace.

Remarks

In many cities, the regulation of dead vehicles is comparatively easy, as, for instance, in Washington, where there are scores of places, many of them in business sections, where in the aggregate thousands of cars could be ranked or parked if the spaces were skilfully laid out and where they would create no menace in case of fire and no hindrance to moving traffic. In New York, however, there are but few such places which can be set aside for waiting vehicles and therefore the problem is more difficult.

The primary objects of roadways are to enable vehicles to go from place to place and to set down or take up passengers and to load and unload mer-

chandise. Vehicles which are confining their activities to these objects should, of course, be let alone so long as they observe the provisions of Article III of the GENERAL TRAFFIC REGULATIONS, but vehicles which are encumbering the roadways for individual indulgence and convenience should be strictly restrained from doing so.

This paper has been written for technical men, especially for those who are making a study of traffic regulation as a branch of civil engineering. In the not distant future, these problems will be their problems, and they will be employed by the government to work them out. Only by specialists can complicated traffic problems be solved, and the problem of providing for the accommodation of the greatest number of waiting vehicles in a given space on the highways and in specially constructed storage places is one of our greatest civic problems today. The time when such things are left to inexperienced members of police departments or of so-called traffic advisory committees is about over. Already six of our great universities have interested themselves in highway traffic regulation, and soon courses of instruction will be part of the curriculum. Of the fifty billions of dollars invested in our country in transportation, less than twenty billions is in railroads, more than twenty in highway transport and ten in electric roads and waterways. That is to say, in about a quarter of a century highway transport has from nothing already passed the railroads, and is steadily increasing in relative volume and importance. It is needless to say that the best minds must be employed on the regulation of highway traffic, if we expect to prevent the now appalling and needless loss of life and to make highways transport function without undue delay and with the greatest efficiency.

It is up to all associations interested in traffic regulation to keep their eyes on city engineers (note) and other officials who in their ignorance of traffic requirements are cutting off corners on a rule of thumb radius, permitting car-tracks to be laid out unscientifically, placing traffic towers in the wrong places and allowing fountains and other monuments to be erected where they unduly limit ranking and parking facilities, and so forth, and so on. It is easier to prevent than it is to remedy.

It may be interesting to know that on account of the urgent necessity for solving this question of ranking and parking, especially by dead vehicles, the Eno Foundation for Highway Traffic Regulation is this year giving prizes at Yale and at George Washington Universities for essays on the subject which will add value in bringing about a satisfactory solution.

NOTE: Each city should of course have a Traffic Engineer to plan out all special regulations in relation to the ranking and parking of live and dead vehicles, etc. (See Part I—Division A—Section 12.)

The best solution for the storing or garaging of dead vehicles on roadways is one of the most serious civic problems of the day. In cities like New York, Boston or Philadelphia it may even be reasonably required that there be no dead vehicles permitted in the congested parts of these cities during certain hours. In Washington, on the contrary, where there are such a great number of places where ranking and parking spaces may be scientifically marked out, there is no very great difficulty. It is, in Washington, simply a matter of lack of ability of the authorities to use what available space they have with intelligence.

The primary reason for roadways is to enable vehicles to move from place to place and to permit them to take up and set down passengers and load and unload goods. Vehicles which are not engaged in these activities are of secondary importance and should be permitted to be stored or garaged on roadways only when they do not unreasonably interfere with those vehicles which are moving or loading or unloading.

Live vehicles can be given more liberty than dead ones because they can be immediately moved out of the way of moving vehicles and of those which have to load or unload.

If there is to be any preference given to any kinds of passenger vehicles over any others, it should be to public carriers such as street cars, buses and taxicabs for the reason that they accommodate more people than private cars.

If the street car, bus and taxi service were improved there would be less reason to garage private cars in the street during business and theater hours.

Beginning in 1913 a crusade was begun in New York to improve the taxi service with great success and the methods adopted there have been followed by our more progressive cities. At that time (1912-3) there were but a very few cab stands in New York City. At the request of Mayor Gaynor, the writer undertook to lay out cab stands all over Manhattan Island, Brooklyn, and even down to Coney Island. The first stands in the middle of streets ever used in this country were among those installed at that time. This idea was copied from London.

Many more cab stands should now be added in New York to reduce the number of cruising cabs and to make it easier to find a cab when wanted. At the time the fight was begun in New York it was reported that the hotels were selling the privilege of standing alongside their buildings to cab companies for over $500,000 a year. Now any cab can stand on a hotel cab stand, though owing to recent laxity by the police, this is made as disagreeable as possible by the hotel cab starters for those cabs that are not the ones they wish to have taken. A move to correct this should now be made by the police.

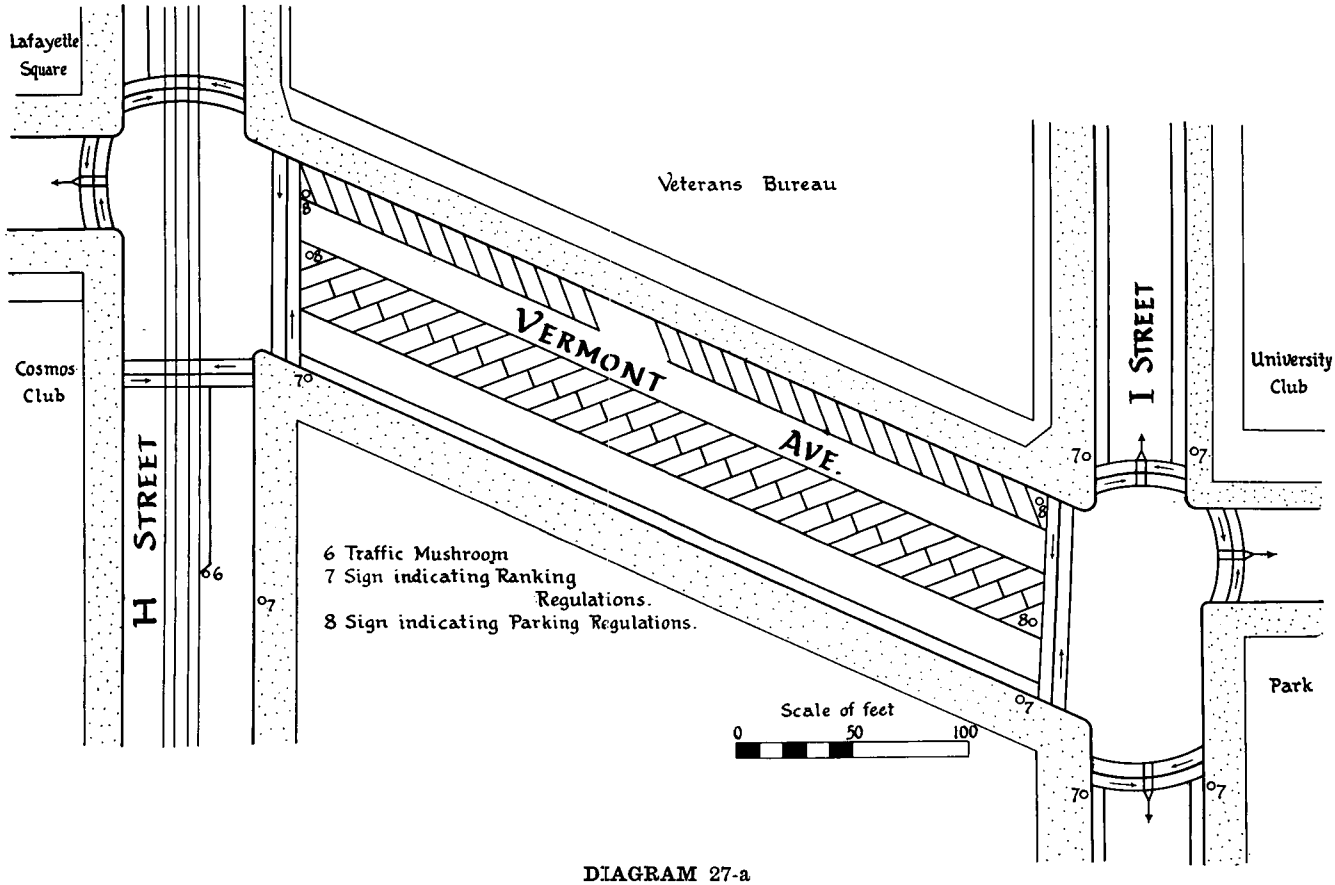

DIAGRAM 27-a

represents a certain location in Washington with parking and ranking spaces and crosswalks marked out scientifically. Notice that the method of dovetailing the parking spaces in the middle of Vermont Avenue saves 7½ feet over the usual method where an unbroken central line is employed.

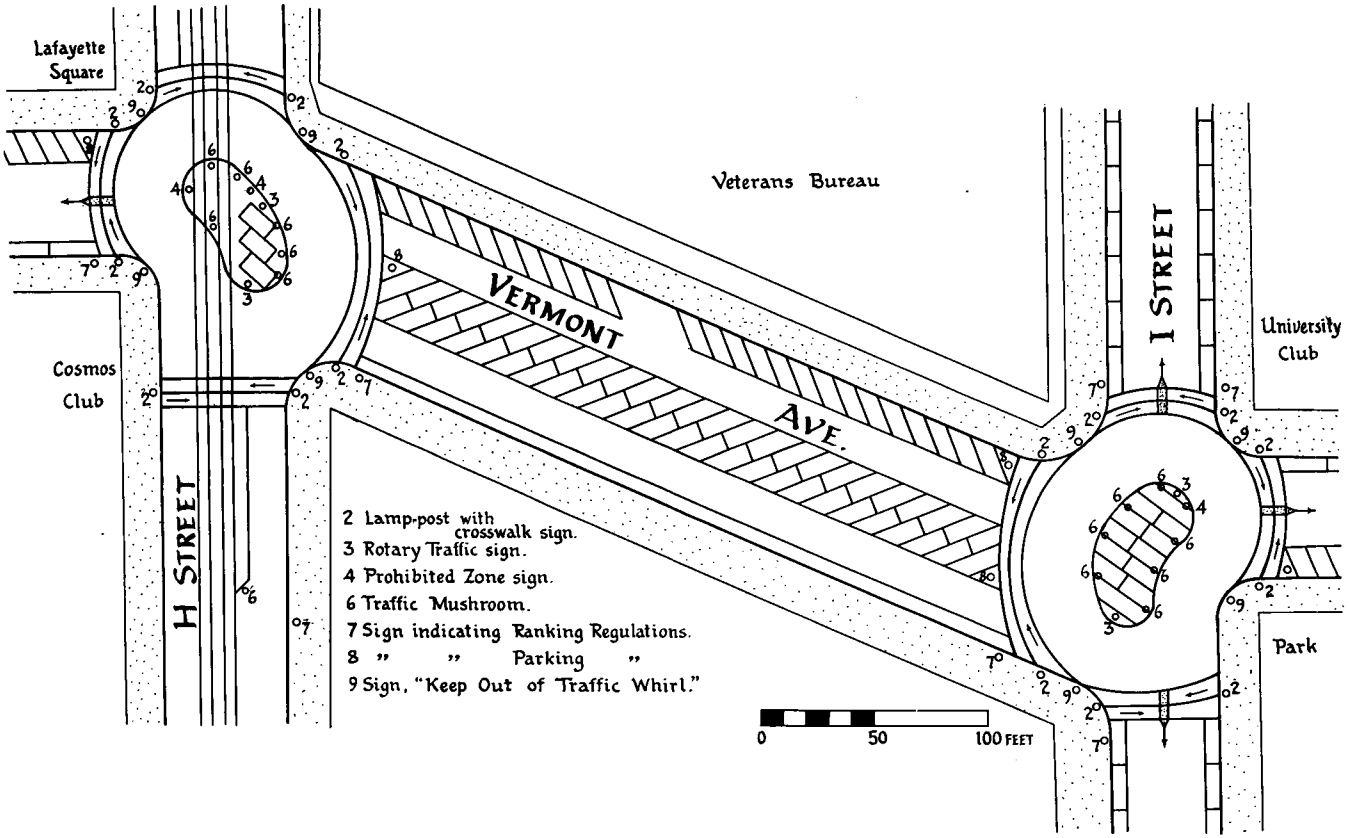

DIAGRAM 27-b

shows the same locality if both H and I Streets are made a uniform width instead of as now having part narrower than the other part and the corners are cut back on a scientific radius and rotary traffic introduced at two intersections.

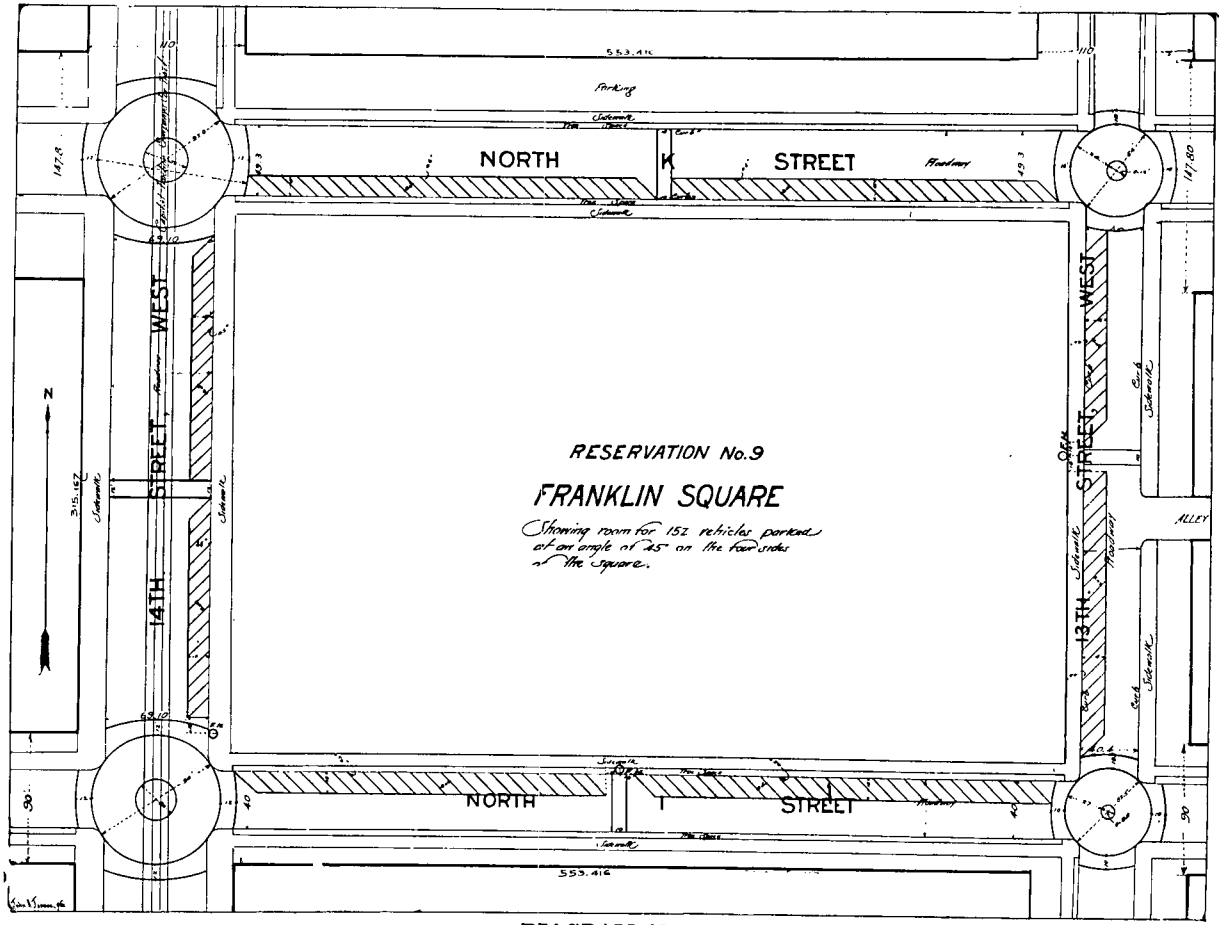
NORTH K STREET
14TH STREET WEST
13TH STREET WEST
NORTH I STREET
ALLEY
553.416
315.162
147.8
147.80
N
RESERVATION No. 9
FRANKLIN SQUARE
Showing room for 152 vehicles parked at an angle of 45° on the four sides of the Square.

DIAGRAM 28

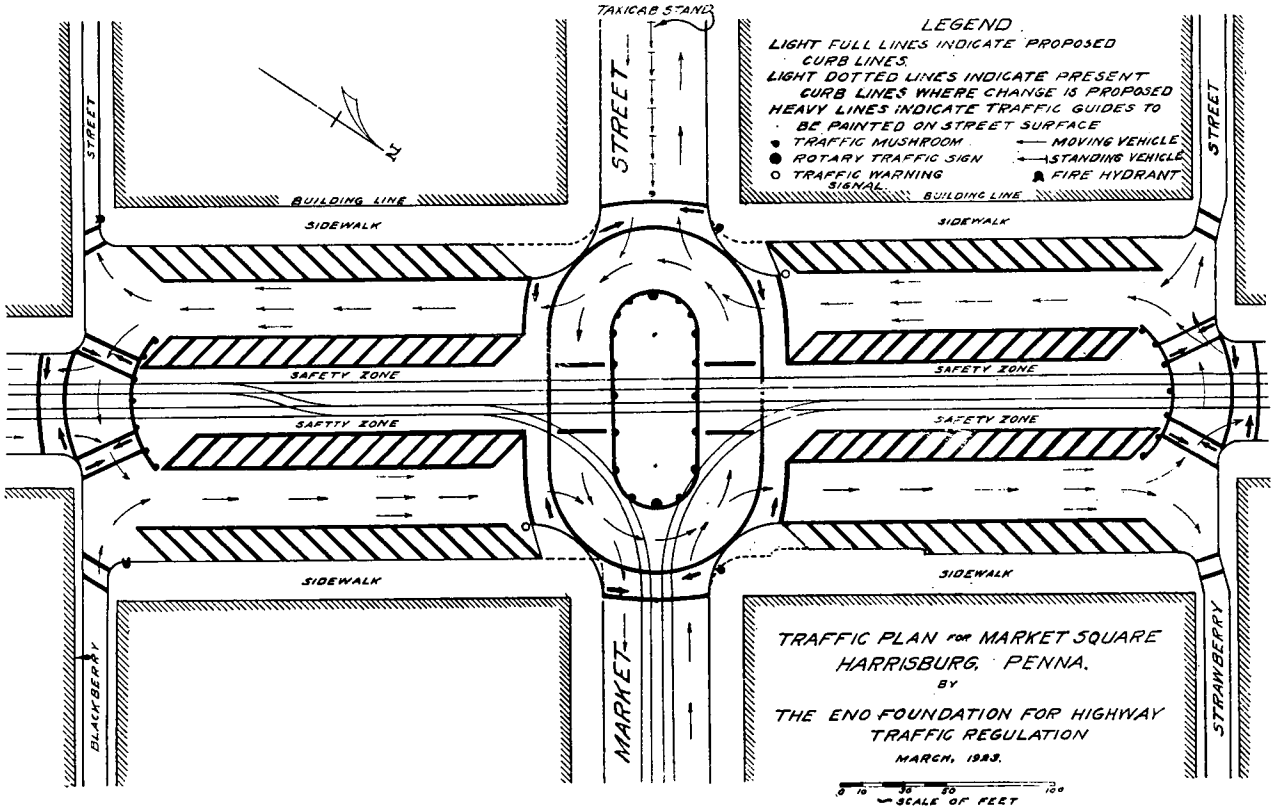
TAXICAB STAND
LEGEND
LIGHT FULL LINES INDICATE PROPOSED CURB LINES.
LIGHT DOTTED LINES INDICATE PRESENT CURB LINES WHERE CHANGE IS PROPOSED
HEAVY LINES INDICATE TRAFFIC GUIDES TO BE PAINTED ON STREET SURFACE
TRAFFIC MUSHROOM
ROTARY TRAFFIC SIGN
TRAFFIC WARNING SIGNAL
MOVING VEHICLE
STANDING VEHICLE
FIRE HYDRANT
STREET
BUILDING LINE
SIDEWALK
SAFETY ZONE
SAFTTY ZONE
BLACKBERRY
MARKET
STRAWBERRY
TRAFFIC PLAN FOR MARKET SQUARE
HARRISBURG, PENNA.
BY
THE ENO FOUNDATION FOR HIGHWAY TRAFFIC REGULATION
MARCH, 1923.
SCALE OF FEET

DIAGRAM 29

There is no reason why in a city like Washington a move like that which was made in New York should not be started. There should be many cab stands in Washington in convenient places and many more cabs. Cab fares are ridiculously high in Washington as they are still in many of our cities. Really if there is any difference, the fares should be cheaper in Washington than in New York.

Considerable of our traffic trouble in cities comes from the fact that it takes too much room to turn a car in and so they have to back to make a turn or go around one or more squares which, of course, continues the car in moving traffic over a longer distance than would be otherwise necessary. This means extra street surface used by that car during its progress to get to a given point and is therefore wasteful of street capacity as well as of gasoline.

In London, taxicabs are required to be able to turn in a street twenty-six feet wide without backing. This is a tremendous advantage because it reduces its interference with traffic. If taxicabs can be made in England which can turn in twenty-six feet they can be made in the United States and after a certain date to be specified they should be required to do this in our most congested cities. It would also be advantageous to have a short turning radius for small private cars for city use, but there is at present no car made in our country that has, although they are rather common abroad. Our car manufacturers should turn their attention to this point.

Undoubtedly buses will, eventually, very largely if not entirely, replace street cars in our more congested cities for the reason that bus companies do not have to lay any rails, which is of advantage to them and also to the city, as the joint between the rail and the pavement is where the pavement always breaks down. Buses, being flexible, are less in the way of traffic and they are much less noisy if properly made and maintained. It the event of a street being blocked by fire apparatus or for some other reason, street cars have to wait, whereas buses can make a temporary detour. Therefore, for these reasons and others, it is the belief of the writer that buses will be more desirable than street cars which have not improved very much during the last two decades.

I have ventured these remarks about public vehicles because if the public vehicle service is good, the necessity for leaving dead vehicles on streets will be reduced.

Much discussion has lately come up in connection with the all night storage of dead vehicles on streets which is commonly called all night parking. As usually the vehicles are not parked but ranked, the term parking is inaccurate. What happens is that they are left at the curb continually when not

in use. To stop this practice suddenly would be to inflict a hardship on many people and therefore it should be modified gradually. If a person wishes to leave his car all night in front of his own house, there can be no reasonable objection to that but if he lives in an apartment house, he should have consideration for the other tenants and surely he should not presume to leave his vehicle all night in front of another person's house.

Whether or not it is economy to leave a car out of doors all the time is extremely doubtful. It is, however, easier for the owner who has no garage near his residence to leave it on the street. Whether it is fair to his neighbors is, however, another question, and it certainly increases fire risk.

Undoubtedly much of the unnecessary noise made by motor cars is largely due to the fact that they are unprotected from the weather and because the owner does not take the care of them that he would if he kept them in his own or a public garage.

The infernal racket caused by attempts to start motor cars at night that are out of order is a public nuisance that should be abated by the mayor acting through the Police Department.

The problem of the storing or garaging of dead vehicles, whether they be placed in a ranked or parked position, is in each city a special problem which should be worked out by an experienced traffic engineer who is open-minded and willing to change plans from time to time as he sees how he can improve conditions. It is a difficult job because of the complicated vested real estate interest in properties affected and the selfishness of human nature, but by and large it is a problem which must be solved for the best interests of the people collectively.

CHAPTER 9

THE TERRIBLE COST OF TRAFFIC ACCIDENTS

There is as yet no adequate system for recording highway traffic accidents anywhere in the United States and in many places practically no system at all so that many who are injured get home or out of town and there is no record of the accidents although they may finally result in death.

During the nineteen months of the World War, it was estimated that the loss of life by highway traffic accidents in the United States was pretty nearly twice as great as our loss of life through the war itself. During that period hundreds, perhaps thousands, of pedestrians were run down by army trucks driven with a recklessness never surpassed.

A record by the United States Bureau of the Census for 1923 gives deaths 22,621, serious personal injuries 678,000, and economic loss $600,000,000, but

as there is no adequate system of recording accidents these figures are necessarily very incomplete.[1] This was an increase of 3,418 in the number of deaths, over 1922. If the same increase in the number of deaths is shown for 1924 and 1925, it will bring the record to 29,436 for 1925.

If a complete tabulation were possible, 1925 might well show a loss of life of 100 per day or 36,500 per year and taking the same relative proportions as above, serious personal injuries 1,100,000 and economic loss $970,000,000 in round numbers.

Estimating the value of a life at $10,000 and of a personal injury at $500, it shows in money value, loss of life, $3,600,000,000; personal injury $1,100,000,000; economic loss, $970,000,000, or a total of $5,720,000,000. This is a staggering sum when we consider that the actual expenditure by the United States Government for 1923 was only $3,532,269,266.32.

The main object of this chapter, however, is not to attempt to give an accurate computation of loss, but rather to show that it is so great that no means should be spared to reduce it.

The only valuable purpose of a traffic accident census is to ascertain the number and causes of accidents in order to devise means for their prevention. A reasonably reliable traffic accident census could be made by the United States Bureau of the Census through sending out specially prepared blanks to every state which in turn should issue them to cities and towns to be returned to Washington for tabulation within a specified time.

The primary object of this book is to demonstrate a plan which if followed faithfully should reduce accidents to a minimum. The writer believes that the first year after it is put in operation the accidents on our roads would show a falling off of at least fifty per cent, to be halved again in the second year of its operation. Assuming that the figures in the fifth paragraph of this chapter are correct, there would be a saving of $1,860,000,000 the first year and $930,000,000 the second year.

CHAPTER 10

DRIVERS' SIGNALS

With the increase of cars which are closed-in in front and from which it is difficult to make hand signals, if any attempt to standardize these signals is made, it should be confined to such signals as can be easily simulated by an arm semaphore attached to the car.

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[1] A later calculation gives 24,000 recorded deaths for 1925. How many were not recorded it is not possible to say.

So far, the committees who have investigated this subject have been in favor of but one signal which shall indicate caution. However, this signal can be made in such a way as to mean, first, caution and, second, information as to what the driver is going to do.

Silhouette 1 shows arm extended horizontally to indicate caution, but a car turning to the left, silhouette 2, would automatically swing the driver also a little to the left and therefore also automatically lower his arm, whereas if he were turning to the right, it would raise his arm as shown in silhouette 3. Silhouette 4 shows the driver indicating to those behind that they can pass and simply means raising and dropping the arm slightly. If the driver is sitting on the right hand side of the car, these signals would be adapted for that condition.

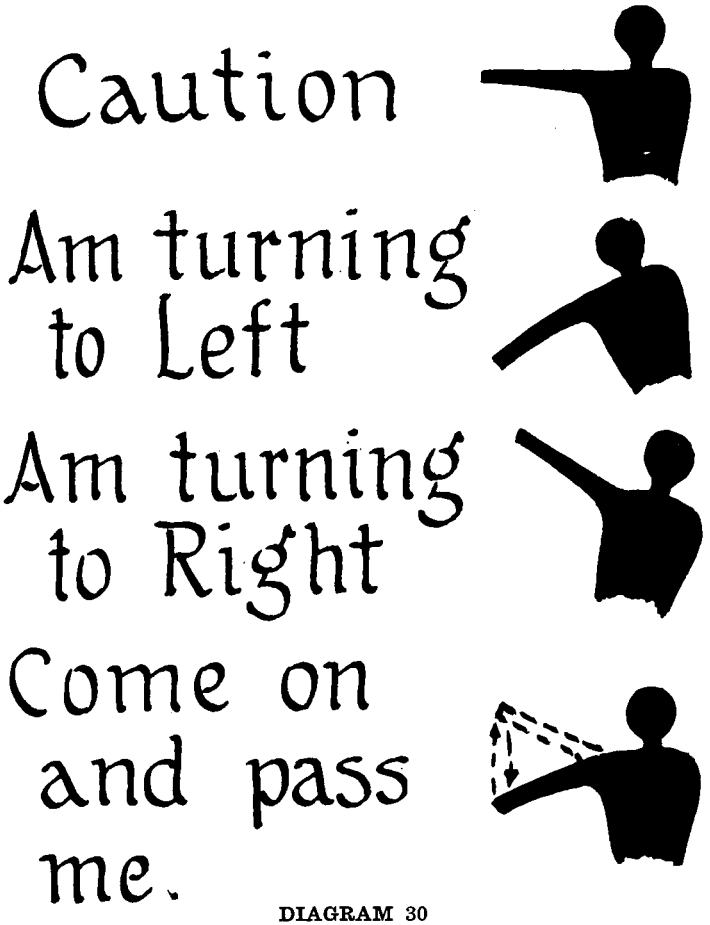

DIAGRAM 30

I am indebted for assistance, encouragement or courtesy to the following people and organizations:

MAJOR GENERAL FRANCIS VINTON GREENE, *deceased, formerly Police Commissioner of New York.*

CAPTAIN ALEXANDER R. PIPER, *U. S. Army, Resigned, Deputy Commissioner in charge of Traffic under General Greene.*

MAJOR GENERAL THEODORE A. BINGHAM, *formerly Police Commissioner of New York.*

FREDERICK H. BUGHER, *deceased, Deputy Police Commissioner in charge of Traffic under General Bingham.*

MAJOR RAYMOND W. PULLMAN, *deceased, formerly Major and Superintendent of Police of Washington, D. C.*

SENATOR JAMES COUZENS, *formerly Police Commissioner of Detroit.*

W. P. RUTLEDGE, *Superintendent of Police, Detroit, formerly in charge of Traffic.*

WM. T. DAVIS, *formerly Inspector of Police in charge of Traffic in New York.*

FREDERICK L. SIDDONS, *Associate Justice of the Supreme Court of the District of Columbia, formerly Chairman of the Board of Commissioners, Washington, D. C., and in charge of Traffic.*

WM. J. EYNON, *who served as member of several of the important traffic committees of the District of Columbia.*

THE BUREAU OF PUBLIC ROADS, *Washington, D. C.*

THE ADVISORY BOARD ON HIGHWAY RESEARCH OF THE NATIONAL RESEARCH COUNCIL, *Washington, D. C.*

THE TRAFFIC SQUAD OF NEW YORK CITY.

THE AUTOMOBILE CLUB OF AMERICA.

THE BOARD OF DIRECTORS OF THE ENO FOUNDATION FOR HIGHWAY TRAFFIC REGULATION, INC.

THE OFFICIALS OF NEW SCOTLAND YARD.

SIR HENRY MAYBURY, *Minister of Transport.*

ALFRED EDWARD, *Sidney, New South Wales, Australia.*

COLONEL PHILIPPE BUNAU-VARILLA, *formerly Engineer of the Panama Canal and first Minister to the United States from the Republic of Panama.*

M. LÉPINE, *formerly Préfet de Police of Paris.*

M. JOLTRAIN, *formerly Inspecteur Divisionnaire, Préfecture de Police Secrétariat General Inspection Divisionnaire de la Circulation et des Transports.*

M. HENNION, *deceased, formerly Préfet de Police of Paris.*

M. RAUX, *formerly Préfet de Police of Paris.*

M. NAUDIN, *formerly Préfet de Police of Paris.*

M. MORAIN, *now Préfet de Police of Paris.*

M. WM. H. DUMONT, *formerly on the Matin.*

CHAMBRE SYNDICALE DES COCHERS ET CHAUFFEURS DE VOITURES DE PLACE DE LA SEINE.

L'UNION SYNDICALE DES TRANSPORTS ET MANUTENTIONS.

FEDERATION NATIONALE DES ENTREPRENEURS DE TRANSPORTS.

BARON DE CARTIER, *Ambassador from Belgium to the United States.*

BURGOMASTER MAX, *of Brussels, Belgium, who has accomplished much for traffic in Belgium.*