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THESIS
TOPICAL OUTLINE OF
HIGHWAY TRAFFIC CONTROL

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Communication Traffic
Traffic regulation
Title

TOPICAL OUTLINE

OF

HIGHWAY TRAFFIC CONTROL

by

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THESIS

P R E F A C E.

The reason for existence of this outline is the almost complete absence of books, or even chapters thereof, on the subject of highway traffic control.

A somewhat larger, but by no means adequate, amount of literature in the form of magazine articles exists. This is increasing rapidly.

In much of the literature and almost completely in the popular view, highway traffic control is confused with a single phase of it, namely, highway traffic control by traffic police. This narrow view of the subject and its problems is undoubtedly the greatest single factor in retarding the development necessary to meet the needs of today. No one understands better than the traffic policeman that leaving the matter to him without proper support and understanding of the manner in which his hands are tied and his sphere is limited, is the chief difficulty.

There is really a need for a treatise upon the subject. The outline form has the merit of not only of conforming to the time available but it also emphasizes salient points and logical relationship better.

The purposes of the outline are:

- (a) To cover the subject in a fairly thoro manner;
- (b) To picture police control of traffic and so much of transport control and city planning as might be necessary to show their bearing on traffic control;
- (c) To present enough of the legal and commercial aspect of highway traffic control to give to the technical traffic control man, the legal man and the commercial expert a clear view of their common ground and a better understanding of the others' field.
- (d) To afford a similar basis for the coordination of the efforts of traffic experts, municipal engineers and planners of the city useful and beautiful.

Most users will experience a feeling of at least momentary disappointment that the "outline has been complicated by the number symbols at the left of each page", but this will give way to a reversion of feeling after short study. The more common method of using mixed Roman, Arabic and letter symbols to indicate the relationship and subrelationship of the many items was rejected only after thoro trial showed its inadequacy.

A decimal classification, patterned after the Dewey Decimal System, has been employed. In addition to its simplicity, there is a great advantage from the clarity of logical relationship shown by it.

To have used the Dewey Decimal System itself, covering all phases of human knowledge, would have resulted in a percentage of missing numbers, relating to extraneous matters, so preponderatingly large that all sense of logical relationship would have been lost.

Returning to the character of the matter presented, what we seem to need is a picturing of the subject in such a way as to make clearness of outline and contrasts stand out sharply. We also desire to see clearly just how the picture is woven into the fabric of modern civilization.

Nearly everyone is brought into contact with highway traffic control every day. There are some very different accounts of what it consists. Is there a parallel between this situation and the description of the elephant as given by the three blind men? If this is our situation, the author would smile with his fellow writers, rather than at them, because he is altogether too conscious of how little he knows about this new-old subject. His aim has been only to aid in advancing our grasp of the matter in hand and its problems.

The author has helped himself generously wherever helpful matter could be found in the works of others. Effort has been made to acknowledge each source at the point of use.

While work was started upon this outline prior to the issue of "Preliminary Topical Outline of the Economics of Highway Transport by Prof. Lewis W. McIntyre, for the Highway and Highway Transport Committee, National Research Council, the author has had, as the result of the interruption of his work, the great advantage of comparing the two undertakings. In order to test whether a rather parallel arrangement was desirable, real effort was made to find a distinctly different basis of treatment. That none proved as satisfactory is at least fair proof that the arrangement of the two outlines is of considerable natural value and logical soundness.

"The outline", like the one on highway transport, "makes no pretense of being either complete or adequate. It has been limited in many ways". The newness of the subject in the limited aspect of police control has caused many to see no connection with the older forms and aspects of traffic control. The research that it has been practicable to make in connecting the two is not as thoro as was desired. The amount that has been done may leave some few persons not fully convinced of the connection.

"Some of the topics", like those in the outline of highway transport, "are capable of considerable expansion; their

use will be determined by the local situation. Others may be used as outlined. It is confidently expected that use of the outline will develop innumerable suggestions for its revision. Such suggestions or criticism will be greatly appreciated.

The references by no means constitute a complete bibliography", particularly of collateral subjects; "neither is it at all essential that all of them be read. Quite often the meat of the reference is only a very small part of the published article and it is hoped that the more important references may shortly be abstracted for more convenient use. In many cases similar references can be found in periodicals more easily available to the individual. Here again lack of time has been the handicap rendering the best selection of these references difficult."

After having thus pointed out some of the similarities between the two outlines, it is pertinent, in order to correct any impression thus created that either one is but a replica of the other, to state that they really join together at but two or three places. Each is rather the counterpart of the other. Prof. McIntyre has dealt quite largely with the features of transport control in his field of "Economics of Highway Transport". In this outline transport control is pictured as the junior control and traffic control as the senior under the principles of law and custom which give precedence to the rights of the State in the exercise of its police power over the rights of the public and the individual, and assert the dominance of public convenience over private. The safeguards against tyrannical employment of these principles forms a large part of the legal phase of transport and traffic controls.

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TENTATIVE CONTENT OF OUTLINE.

THE MAJOR ASPECTS OF HIGHWAY TRAFFIC CONTROL.

- 000. GENERAL. THE FIELD OF HIGHWAY TRAFFIC CONTROL.
- 100. HIGHWAY TRAFFIC CONTROL AND THE PUBLIC.
- 200. THE LEGAL PHASE.
- 300. THE PRINCIPLES OF HIGHWAY TRAFFIC CONTROL.
- 400. THE UNIFICATION OF TRAFFIC CONTROL METHODS.

HIGHWAY TRAFFIC CONTROL EXPANDED INTO THE FIRST ORDER OF DETAIL.

000. GENERAL THE FIELD OF HIGHWAY TRAFFIC CONTROL.

(Where highway traffic control is applied now and where it is likely to be applied.)

010. The Development of Highway Traffic Control.

Steps in development traced from sources; The history of traffic control on the highway; The relation of traffic control to the population capacity of the country; The bearing of highway traffic control upon civilization; Problems awaiting solution and their magnitude; Definitions of traffic control, direction, control enforcement and regulation; Definition of transport control, direction, control enforcement and regulation; General financial aspects of highway traffic control; The logical means and agencies for the development of traffic control on the highway; The field for trained men and the salaries available; The probable future development.

060. Interrelationship of Highway, Railway and Water Traffic Control.

Executive action (and the results thereof) for the correlation of all forms of traffic control to handle routine traffic and extraordinary variations therefrom, due to public gatherings, epidemics, catastrophes, disturbances of the public peace thru rioting, insurrection, invasion or foreign war; also for the reduction of transportation costs, duplications of service, wastes, etc.

070. Traffic Engineering and Community (City) Planning.

Interrelationship of transport and community (city)

planning, each as the outcome of the desire for orderly management of transportation and civic development; Historical development of community transportation with problems peculiar to the type of transportation employed; Traffic control as an after-thought; Community planning as an after-thought; Economic value and limitations on community planning; Economic value and limitations on traffic control; Traffic control studies made as the technical basis for executive correlation of all types of transportation; Human relations and other factors.

100. HIGHWAY TRAFFIC CONTROL AND THE PUBLIC.

(The practice of the art of highway traffic control and its standing before the bar of public opinion.)

110. The Fundamental Customs and "Law of the Road", antedating the Practice of Traffic Control on the Highway.

(Popular knowledge and acceptance of traditional customs and the "law of the road"; courtesies of the highway; Local sectional and national customs and rules.

120. The Practice of Highway Traffic Control.

(The gradual transformation from a crude art to a recognized science - The slow development and slower acceptance of the tactics of traffic control, as the product of scientific research and study of the art and its environment.)

Systems for routine and emergency handling of highway traffic, suited to rural town, city, and military conditions.

130. The Public Welfare.

Effect of highway traffic control on accidents, public health, education, cost of living, wage earning, wealth, content, hours for recreation, and political, economic, social, and cultural progress.

140. The Public Attitude. Its Bearing upon Future Developments.

Present public habits, as regards rules of the road, courtesy to others met on the highway and sidewalk, observance of traffic rules and laws, instincts for playing safe and avoidance of hazards; Individualism, restiveness under the restraints of regulation; Capacity for self control and self government by coordinated political groups, amenability to police direction; Inertia to new ideas, etc.

Public opinion upon traffic control matters, as expressed in the popular and class press, in class organizations, popular movements, political speeches, platforms, and campaigns.

The state of public feeling; Evidences of trend; Evidences of steady progress in certain directions and of oscillation, pendulum like, in other directions; Psychology of the public upon traffic control matters.

Public knowledge of highway traffic control; Centers for the procurement of information and the dissemination of intelligence upon highway traffic control.

Public action upon traffic control matters, as expressed by local, state, and federal legislation, referendum votes, and legislative extensions thru ruling of public service commissions.

Caution: Do not confuse the reflection of public attitude by even public action in a legislative way with the technical jurisprudence falling under "THE LEGAL PHASE". Court decisions, for instance, do not necessarily reflect public attitude but are based upon justice in the abstract but nevertheless progressive form, wholly in keeping with the broad general spirit of the times.

200. THE LEGAL PHASE.

210. The Sources of Highway Traffic Control Authority.

Historical tracing of sources from early tribal military control and protection of the public highway, thru the royal prerogatives over the highway, and the gradual transfer of the royal prerogatives to the public; History of the right of eminent domain, right of adverse user, the "law of the road", and other public rights in relation to their bearing upon the highway; History of the right of the public to free and safe use of the highway; History of the rights of abutting property owners; The modern balance which must be struck between freedom and safety.

220. Analysis of Legal Sources of Highway Traffic Control Jurisprudence.

Constitutional, legislative, and common law sources; Judicial notice of custom and the "law of the road"; Rulings by public service commissions; Municipal ordinances; Police regulations; Judicial decisions.

230. Highway Law of Today.

Legal principles involved; Precedents; The state of the law as to its clarity, being in step with modern developments and requirements, need for codification, etc.

240. The Profession and Practice of Highway Law.

The field for the legal specialist; The status and recognition accorded it as a specialist's field; The volume of cases and the adequacy of present personnel and facilities for handling them; The courts in which it is practiced; The advisory and consultive opportunities afforded; The financial prospects for beginners; The future outlook.

250. The Trend of Developments in Highway Traffic Control Jurisprudence. Its Bearing upon Future Developments.

300. THE PRINCIPLES OF HIGHWAY TRAFFIC CONTROL.

(The basis for the growth of a science from the art of traffic control thru research and investigation.)

310. Safety to the Public.

Principles governing risks and the choice of corrective precautions; principles for measuring the relative importance and economic aspects of various hazards; economic comparison of risks and the expense of safety precautions.

320. The Law of Economic Necessity.

The greatest good for the greatest number in its broadest aspects. Specifically, the obtaining of the value to the public from the cost of its investment in the public highway. The proper application increases, while improper application decreases, highway capacity.

Real and apparent saturation of highway capacity and the tell-tales of each.

330. The Law of the Balance Required Personnel, Rolling Stock, Traffic Terminal, and Traffic Channel Capacity.

Methods for measuring each of the four capacities and determining the state of balance. The first two as the junior control, called Transport Control; The second pair as the senior control, called Traffic Control. The strategy of Transport Control and Traffic Control flow from investigation and grasp of the interrelationship of the four capacities.

340. The Strategy of Traffic Control in General. The Inter-relationship between Highway, Waterway, and Railway Traffic Control.

350. The Dominance of Physical Laws.

360. The Law of Evolution, or Adaptation to Progress and Needs.

370. Human Factors and Psychology.

(In their relationship to the other factors entering into the composite greatest good for the greatest number.)

380. The Principle of Vested Rights and Interests.

390. Basic Principles of Coordinated Effort and Organization.

400. THE UNIFICATION OF HIGHWAY TRAFFIC CONTROL.

410. Historical Summary of the Trend toward Unification.

420. The Forces Working for Unification.

430. The Forces Opposed to Unification.

440. The Merits of Unification and the Opposing Arguments.

450. InertiaObstacles to the Correct Solution.

460. Plans for Expediting the Correct Solution.

P A R T II.

HIGHWAY TRAFFIC CONTROL EXPANDED INTO THE SECOND ORDER OF DETAIL.

000. GENERAL. THE FIELD OF HIGHWAY TRAFFIC CONTROL.

- {02} Compends, text books, etc. Dewey Classification 336.3(02)
- {03} Cyclopedias, dictionaries, etc.
- {04} Essays, addresses, magazine articles.
- {05} Periodicals.
- {06} Societies, associations, etc.
- {07} Education, teaching. Schools, colleges, universities.
- {08} Tables, calculations. Miscellanies.
- {001} Statistics.
- {002} Quantities and costs.
- {003} Contracts and specifications.
- {004} Designs and drawings.
- {005} Executive.
- {006} Working and maintenance.
- {007} Laws.
- {008} Patents.
- {009} Reports.
- {09} History. Progress and development.

The above parenthetical numbers are the set form numbers that are used whenever occasion arise thruout the Dewey Decimal Classification System to indicate the form in which material to be classified is found.

010. THE DEVELOPMENT OF HIGHWAY TRAFFIC CONTROL.

- 011. The History of Highway Traffic Control.
- 011.1 Evidences of highway traffic control ante-dating the Roman era.
- 011.2 Highway traffic control as practiced by the Romans.
- 011.3 Byzantine Roman highway traffic control.
- 011.4 Medieval European highway traffic control.
- 011.5 European and American highway traffic control, 1492-1900.
- 011.6 European highway traffic control since the advent of the automobile.
- 011.7 American highway traffic control since the advent of the automobile.
- 011.9 Miscellaneous historical data on highway traffic control.
- 012. Relation of Traffic Control to Civilization.
- 012.1 The relation of traffic control to the population capacity of a country or district. Famines, epidemics, invasions.
- 012.2 Highway traffic control as a fundamental element in the ability of a people to defend themselves. Victory goes to the one that "gets the most men there first".
- 012.3 Highway traffic control as a fundamental element in the commercial and trading capacity of a people.
- 012.4 Effect of highway traffic control on the diversity of industry of a people. Economic specialization of effort

as a result of the diversity of industry. The growth of trades, vocations and professions change the habits of a people from nomadic to settled habits. Need of markets force organized effort at transportation and the control of trade.

- 012.5 Effect of safety in travel upon intercommunication of ideas. Education, moral and mental development.
- 012.51 Social intercourse a necessity for all mankind. Social intercourse is everywhere dependent upon the safety, convenience and dependability of controlled transportation.
- 012.52 Education, especially in rural communities, is everywhere dependent upon the capacity to render transportation safe, convenient, and dependable.
- 012.53 Distribution the greatest problem of our civilization.
- 012.531 American manufacturing and raw material industries highly specialized and grouped in districts. Same is true of specialized agriculture, horticulture and animal husbandry.
- 012.532 Food distribution dependent upon efficient transportation.
- 012.533 Much of difference in price to producer and consumer due to avoidable transportation and storage charges arising from uncoordinated management, avoidable delays, loss and shrinkage in transit, etc.
- 012.534 Economic gain by change from unorganized, unskilled, inefficient and individualistic transportation effort to organized, skilled, efficient, unified or coordinated transport.
- 012.535 Economic gain from cut-throat competition by small irresponsible companies rendering expensive and unsatisfactory service being displaced by service of larger enterprises commanding the highest capacity for management, responsible to public service commissions and rendering dependable service of grades suited to the economic requirements of the several classes of trades.
- 012.536 A practically constant decrease in transportation rates as a result of gradual development and more intelligent application of the principles of transport control and traffic control in spite of an increase in first cost of plant and equipment per unit of capacity of vehicle and, frequently, an upward tendency in the total cost of producing a unit of transportation results. Principle of the economy of mass production.

013. Highway Traffic Problems and Their Magnitude.

In the interest of brevity, this phase is merely outlined here. The acuteness of the traffic situation arising out of the existence of some 14 000 000 motor vehicles in the United States is an every day experience of the public. No more is required here than to show the method of tying in this phase. In use this number, 013, will be best employed as a "form" number, similar to the Dewey Classification form numbers shown above, to indicate the problem character of material falling elsewhere thruout the outline.

(013) Problems arising:

- 000. Under the 000. section of the outline.
- 100. Under the 100. section of the outline.
- 120. From the practice of highway traffic control.
- 120.1 From general speed regulations.
- 121. From traffic customs and rules developed from usage.
- 122. From registration, in general.
- 122.1 From registration of vehicles.
- 122.2 From registration of drivers.
- 122.3 From registration of public carriers.
- 123. From legal and regulative restrictions on enterprises conducted upon the public highway, including franchises.
- 124. From time and seasonal restrictions on moving traffic.
- 125. From parking.
- 126. From adaptating traffic control to the rights of abutting property owners and rights of the adverse user.
- 127. Thru establishing restricted routes.
- 128. Thru establishing guarded or police controlled routes.
- 200. Under the 200. section of the outline.
- 300. Under the 300. section of the outline.
- 400. Under the 400. section of the outline.

020. Definitions of traffic control terms.

021. **TRAFFIC CONTROL:** The directive function flowing from public ownership of the highway. It comprises:

- 021.01 Control over the routing of traffic entering the controlled area.
- 021.011 Establishment of restricted routes.
- 021.02 Control over the priorities (time schedules) of traffic, especially over congested routes.
- 021.03 Coordination with waterway, railway and air traffic.
- 021.04 Unification of authority over single routes.
- 021.05 Providing for uniformity of traffic control regulations.
- 021.06 Application of unified traffic control regulations.
- 021.068 Establishment of guarded or police controlled routes.
- 021.07 Making of highway and terminal inspections, investigations, surveys, and traffic plans.
- 021.079 Making circulation maps with necessary instructions.

Caution: Fragmentary parts, or the dismembered and inarticulate whole, do not constitute highway traffic control. The essence of the thing lies not merely in the union of the parts but in the rational working of all parts in unison. The subdivision of 021068, which stands for the hand waving of the traffic policeman at the street corner is merely symbolic of the whole to an extent not greater than the crossed wig wag flags of the Signal Corps typify the work of that Corps thru the employment of the communication systems represented by wig wag, heliograph, Ardois lanterns, semaphore, field buzzers, telephones, couriers, telegraph, cables and radio. Impaired control may at times suffice but control really exists only when it is complete.

- 021.1 **TRAFFIC DIRECTION:** The making of traffic laws and rules.
 - Government of traffic affairs;
 - Legislation relative to traffic;
 - Power over traffic affairs;
 - Dominance in traffic affairs;
 - Command over traffic affairs;
 - Active direct control of traffic;
 - DIRECTION OF TRAFFIC AFFAIRS;**
 - In charge of traffic affairs;
 - Management of traffic affairs;
 - Authority to act or withhold action in traffic matters;
 - Issuance of orders relative to traffic affairs;
 - Superintendence of traffic affairs;
 - Supervision of traffic affairs;
 - Inspection of traffic and traffic control;

Investigation of traffic and traffic control;
Advisory management of traffic affairs;
Technical examination of traffic and traffic affairs;
Surveillance of traffic affairs;
Oversight of traffic affairs.

021.2 TRAFFIC CONTROL ENFORCEMENT: Constraint of traffic to the laws and rules.

Coercive enforcement of traffic control;
Peremptory enforcement of traffic laws and rules;
Compelling obedience to traffic control;
Obliging traffic to conform to traffic laws and rules;
Summary enforcement of traffic control;
Obedience to traffic laws and rules under duress;
Constraint of traffic to laws and rules;
Restraint of traffic to laws and rules;
Securing obedience to traffic laws and rules;
Requiring obedience to traffic laws and rules;
ENFORCEMENT OF TRAFFIC LAWS AND RULES;
Carry thru traffic control;
Execution of traffic laws and rules;
Proceeding with traffic control enforcement;
Securing the observance of traffic laws and rules;
Requiring the observance of traffic laws and rules;
Carrying on traffic control enforcement;
Putting traffic control into effect;
Putting traffic control into practice.

021.3 TRAFFIC REGULATION: The adjustment of traffic to laws and rules.

Requiring traffic to conform to laws to laws and rules;
Requiring the observance of traffic laws and rules;
Putting traffic control into effect;
Putting traffic control into practice;
REGULATING TRAFFIC;
Fitting traffic to laws and rules;
Reconciling traffic to laws and rules;
Educating traffic to laws and rules;
Adapting traffic to laws and rules;
Teaching traffic obedience to laws and rules;
Making traffic and the laws and rules dovetail;
Instructing traffic in the laws and rules;
Adjusting traffic to the laws and rules;
Informing traffic upon the laws and rules;
Readjusting traffic to the laws and rules;
Enlightening traffic upon the laws and rules;
Conciliating traffic to obedience to laws and rules;
Imbuing traffic with respect for laws and rules;
Accommodating traffic to obedience to laws and rules;
Implanting in traffic a knowledge of traffic control;
Securing a respect for traffic control;
Suiting traffic to the laws and rules;
Disseminating a knowledge of traffic rules and laws.
Harmonizing traffic with the laws and rules.

022. TRANSPORT CONTROL: The management function of proprietorship.

022.06 TRANSPORT TECHNICAL CONTROL: The authority and responsibility for determining:

PART I: The transport service requirements for:-

1. PERSONNEL

- a. The type required;
- b. How to procure;
- c. Where to procure;
- d. Qualifications of the procured
- e. Basic training required;
- f. Tests of readiness and tactical (technical) skill.
- g. Replacement;
- h. Tactics or technique.

2. MATERIAL

- a. The type required;
- b. How to procure;
- c. Where to procure;
- d. Specifications;
- e. Any adaptation necessary after procurement;
- f. Technical inspections;
- g. Repair and replacement.

PART II: Execution of all of Part I not excepted.

Caution: The exceptions need to be very clearly stated in each case.

022.1 TRANSPORT DIRECTION: The superior command over transport; The authority to say to what uses available transport will be put: The question of what to do. Also general responsibility for results.

022.16 TECHNICAL TRANSPORT DIRECTION: Advisory professional supervision which formulates the doctrines and defines the objectives of transport control - The making of the transport laws, rules and regulations.

022.2 TRANSPORT CONTROL ENFORCEMENT: Active direct command of transport organizations; Transport control execution. The subordinate command of the actual transport unit involves an inseparable trio of one authority and two responsibilities, namely: (a) The authority to execute the mission: The question of how to do it; (b) Specific responsibility for the readiness and tactical (technical) skill of personnel; (c) Specific responsibility for the completeness and serviceability of equipment.

022.3 TRANSPORT REGULATION: The adjustment of transport to laws and regulations.

022.4 TRANSPORT ORGANIZATION: The functional arrangement and disposition of the interdependent parts of a transport system, corporation, or service.

022.40 Headquarters organization.

022.400 The ownership element - The stockholders, including stock holders' associations.

022.4001 The directive element - The board of directors.

- 022.40011 The chief director. The president of the board.
- 022.4010 The management element.
- 022.4011 The president of the system or corporation. The chief of the transport service.
- 022.40111 Assistants to the president. Aides.
- 022.40112 Executive and administrative contact with regions.
- 022.4012 First vice president or deputy chief, frequently in charge of headquarters organization.
- 022.4013 Secretarial function.
- 022.4014 Financial and treasury function.
- 022.4015 Legal advisory service.
- 022.4016 Personnel service.
- 022.4017 Engineering service. R.R. frequently place this in the operating dept.
- 022.4018 Accounting and statistical service.
- 022.4019 Purchase, real estate and insurance service.
- 022.402 Transportation or operating department.
- 022.403 Maintenance department. Several of the largest R.R. unite operation and maintenance in the operating dept
- 022.4033 Maintenance of rolling stock.
- 022.4034 Maintenance of plant and facilities.
- 022.4035 Maintenance of way (when a private right of way exists)
- 022.404 Traffic department - Sales (of services) department. Acts as an inspection and reporting service upon the work of the operating and maintenance department in particular.
- 022.410 Regional organization. Subdivided as above, as required
- 022.420 Sectional organization. " " " " "
- 022.430 Divisional organization. " " " " "

NOTE: Transport organization having their own right of way merge traffic control and transport control. The term, traffic, is therefore used most frequently in the sense of patronage. The necessity for civilian highway traffic organization is just now coming to be appreciated as the point of the caution under 021.079 comes to be grasped. It is not practicable therefore to show a civilian traffic control organization.

030. Evolution in the devices and means of transportation.
031. General law governing the development of a transportation device: The history of all successful mechanical devices show the same period covering variable time intervals, namely; Early period of struggle for recognition; Development period during which the number of the device in use multiplies rapidly; A period of no marked gain or very slow gain at the best, commonly called the "saturation point"; Not infrequently a period of decline. Few transportation devices show the fourth period because of the next principle.
032. The insatiable demand among occidental races for transportation facilities. Eliminating sporadic cases of imprudent investment, demand exceeds the supply of transportation facilities except during temporary periods of business depression. So long as investment is prudent this will continue.
033. Transportation devices are subject to the principle of the survival of the fittest for meeting the ever growing demand for transportation.
034. The four elements of transportation capacity, arranged in the usual order of insufficiency, stand as follows, the weakest first: 1. Terminal capacity; 2. Transportation channel capacity; 3. Rolling stock capacity; 4. Personnel capacity.
035. Capacity for management develops only under the pressure of necessity for it, hence both transport control and traffic control are always after-thoughts born as the result of expensive and chastening experience. It is not too much to say that they are, in general, chronically insufficient.
036. The economy of transportation is dependent upon the degree to which the insufficiency of transport control and traffic control for their respective tasks is minimized.
037. Most of the ^{fundamental} principles of transport control and traffic control are independent of the type of transportation and the devices employed.
038. The surface aspects and principles pertaining to the different types of transportation not infrequently appear to be quite dissimilar.
039. The world is now on the threshold of coordination of highway, waterway, railway and air transport. Hence many of the bearings and effects of evolution in the devices and means of transportation are not yet clear.

040. Financial aspects of traffic control.

040.1 The elements of cost of rendering highway traffic control service.

040.11 Elements properly chargeable to capital expenditures.

040.12 Elements properly chargeable to operating expense.

040.13 Elements properly chargeable to taxes, license fees, etc. payable to another taxing element of government, if any

040.14 Elements belonging under fixed charges.

040.15 The magnitude of the several elements under various conditions.

040.16 Ways and means of minimizing each element of cost.

041. Highway traffic control is a part of the general police (legal sense) power of the State. Part is exercised by delegation of authority to counties and municipalities.

041.1 Registration form, 122., of traffic control is exercised by States; Forms 123, 124, and 127 are exercised jointly by States, counties and municipalities; Forms 125. and 128. are exercised largely by municipalities.

041.2 Proportions of total costs, by classes, borne by the States; by the counties; by the municipalities.

041.3 Analysis of tax paying sources and amounts paid for traffic control purposes to the States; to the counties; to the municipalities.

041.31 Evidence of any large and widespread inequalities in distribution of burden in proportion to the benefits accruing.

041.32 Same, for any large local inequalities.

041.33 Bearing of evidence upon the common belief that it is unnecessary to go beyond the principle that the economic benefits from highway traffic control rest, as does the taxation which supports it, upon the consumer of transportation and of things transported.

042. Tax distribution methods adapted to the accruing benefits of highway traffic control.

042.1 R.R. accounting methods as a point of beginning.

042.11 Points for the affirmative side.

042.12 Points for the negative side.

042.13 Decisions based upon 042.11 and 042.12.

- 042.2 Capital charges, like those for highway construction and other creations by the several elements of government, designed for public welfare, safety and convenience, should be borne by general taxation.
- 042.21 Points for the affirmative side.
- 042.211 Granted that general taxation should be fairly distributed. If it is demonstrable that this is not done, apply the correction at the source. Dragging such faults if they exist, into proposition 042.2 only serves to increase confusion of mind when clarity of reasoning is essential.
- 042.22 Points for the negative side.
- 042.23 Decisions based upon 042.21 and 042.22.
- 042.3 Operating expense is properly chargeable (a) by elements of the government to vehicles using the highway (b) on a flat rate (c) on a mileage rate.
- 042.31 Points for the affirmative of (a).
- 042.311 The size, load and character of the vehicle has little bearing on the amount of traffic control supervision required.
- 042.312 The big factors are:
- (a) The lack of organization of the traffic mass;
 - (b) The great variety of purpose and objective of the individual vehicles;
 - (c) The playing for advantage in which the driver makes full use of the nimbleness and sometimes of the capacity for blocking others which is inherent in his vehicle;
 - (d) The mixing of different classes of vehicles with speed characteristics (animal drawn vehicles and local stop street cars in particular) which slow up all traffic, thereby decreasing highway traffic capacity;
 - (e) Safety considerations affecting the pedestrian and other vehicles;
 - (f) The habits of the public in desiring to all be at the same place at the same time, thereby adding to the seriousness of the problem when there is a special attraction, an accident, catastrophe, or in getting to and from work, the athletic contest, theater, etc.
 - (g) The heaviest expenditures are made to cope with the general average of peak load conditions; then the infrequently used car in the hands of an inexperienced driver is likely to be much more troublesome than cars of high mileage in experienced hands.
- 042.313 Cost of the registration form of traffic control is almost directly proportional to the number of vehicles.

042.32 Points for the negative of 042.3 (a).

042.321 It is improper to put the whole burden on the vehicles when the reason for traffic control are the convenience and safety of pedestrians primarily and of vehicles secondarily. The pedestrian would thus fail to pay any of his rightful proportion.

042.322 The automobile should bear the principal part, out of proportion to its proportionate number representation:

042.3221 Points for the affirmative of 042.322.

042.32211 The speed of the automobile, its inability to stop promptly and the recklessness of its drivers make it the predominating menace.

042.32212 The passenger automobile wastes highway capacity at a fearful rate. With maximum width vehicles of 8 feet establishing traffic lane width, 1 person in a 5 passenger car occupies 30 times as much street space as 1 person walking on the side walk. With all 5 seats filled, each passenger occupies 6 times as much space as the pedestrian and 7.3 as much space as 1 person in a street car with all seats filled. When standing room in the street car is filled, the ratio against the passenger automobile is 17 to 1. In congested streets the automobile moves no faster than the street car and each of them move but little faster than the pedestrian.

042.32213 Pedestrians and street cars seldom park in the highway except when forced to do so temporarily. Parking problems were almost unknown before the day of the automobile. Now many of them habitually overstay the time limits granted to them as a special consideration. They absorb a large highway space for long periods without rendering any service whatever except to the convenience of their few passengers.

042.32214 Parked automobiles produce congestion by blocking the passage of other vehicles.

042.32215 Parked automobiles contribute materially to accidents by obscuring the view and by occupying space that other vehicles need.

042.32216 Parked automobiles cost much in lives and property lost by fire by delaying the passage of fire apparatus and because vehicle frequently have to be moved before fire fighting can begin; also the congregation of vehicles in the vicinity of fires greatly hampers apparatus responding to second and later alarms.

042.32217 Parked automobiles occupy much of the time of the police and the traffic control authorities.

042.3222 Points for the negative of 042.322.

042.32221 See 1923 statistics for street accidents in London, Eng, Item 993, Automotive Abstracts, Apr. 1924. "A conveyance that travels 10 000 miles per year is obviously subjected to twice the risk of highway accident incurred by one running only 5 000 miles. On this basis it may well be questioned whether the present statistics show the horse as any safer than the motor, seeing that the proportion of motor to horse mileage in London is probably more than the than the proportion of motor to horse accidents". There were only 5.6 as many motor as horse accidents. The brake system of automobiles is much more efficient than that on horse drawn vehicles. Where any considerable congestion exists the speed of automobiles is not so very much higher than that of animal drawn vehicles and, when animal drawn traffic is present it slows all traffic to its pace. For the same speeds, the automobile can stop much more quickly. A runaway automobile tearing madly thru a crowd is almost unheard of thing. It was only yesterday we stopped talking of the terrible accidents due to runaway horses. We have simply forgotten the hair raising accounts of the wreck and havoc of the runaway horse of yesterday. See in this connection the view of the courts upon 042.32211 under 250.

042.32222 042.32212 ignores the fact that the automobile, due to its flexibility as to route, as compared to the street car and pedestrian, and its speed, dodges around traffic congestion whenever adequate by-passes are created. Its speed is also an important factor in the promptness with which modern congested conditions clear up, as compared with the slower traffic of earlier days. Furthermore it is at least 17 times as comfortable to travel with a good seat in a 5 passenger car as it is to be a strap-hanger in a sardine packed street car.

042.32223 Hitching of horse vehicles upon the principal thoroughfares was stopped years before there was an automobile. They were allowed to stop only long enough for passengers to alight or enter in that day, as the passenger car is now. The crowd of pedestrians gather to watch an accident, fire, street parade, etc. now just as they did formerly. The automobile has produced many new conditions but the failure of people to recall at once the conditions in our streets only a few years back is not in itself valid evidence on which to condemn so great a utility as the automobile.

042.32224 A parked automobile occupies only about 2/3 of the space required for the horse and carriage of yester-

day. The fact that thousands of working people who could not afford a horse and carriage 25 years ago ride to town and park their car today is not a sound argument against the automobile, nor does it justify the heaping of additional taxation on to the poor man's car of today. 81.6% of the cars produced in 1923 were under the \$1 000. class.

No evidence is shown that cars are parked today on streets on which the hitching of horse was prohibited 25 years ago, while no one can doubt that the reverse is true in many instances.

Men were prosecuted not infrequently 25 years ago for cruelty to animals on account of the time they left animals hitched on the street without food, water or shelter. Because the greater number of cars today, as compared with the buggies of 25 years ago, have forced a reduction in the parking time allowed and required the setting of limits where there was no limit before, is not a valid argument against the automobile.

The number of vehicles placed in day garages or parked on private property grows by leaps and bounds, absorbing every garaging facility or guarded parking opportunity as promptly as they are made available. The percentage of automobile thus cared for probably exceeds by a large margin the percentage of carriages similarly provided for 25 years ago.

042.32225 The validity of 042.32215 depends entirely upon the increase in the number of automobiles today over the number of horse drawn carriages 25 years ago. In other words it depends wholly on the greater popularity of the automobile and on the increased purchasing power of the average American citizen. Acceptance of such argument leads logically to the false conclusion that the desire for an automobile is wrong and the power to buy it is a disadvantage.

No one has yet seen a runaway automobile charge thru a mass of other automobiles and start them to running away by communication of its own fright and panic.

042.32226 While point 042.32216 is formed on a tissue of truth of quite serious portent, it is but the old argument that the total number of vehicles in use has increased to a marked extent in 25 years to the manifest advantage of the American public. This attendant disadvantage sounds big but is really small. However it is recognized as a serious problem which merits close attention and prompt remedy by increasing the private parking facilities.

042.32227 Point 042.32217 brings the old argument of increase in numbers, answered above, in new guise, but without new merit. It is plain that the increase in vehicles has required a disproportionate increase in police forces. It is doubtful whether the proportion of police time devoted to parking abuses has materially increased.

042.32228 It was only 15 to 20 years ago that our American cities pointed with pride and picture to its white winged army of street cleaners working in day and night gangs to clear the streets from the tons of disease breeding offal dropped upon them every day by the thousands of horses which then fouled the streets. Can it be true that this army of laborers and their bosses are already forgotten?

Our quantity production experience teaches that it certainly should have been far cheaper to remove this offal per ton 20 years ago than it is today. The horse drawn vehicle is an expensive luxury to clean streets after today and yet public health demands that it be done.

042.32229 Now when the automobile is already ~~is~~ paying more than the total cost of highway maintenance (See Nat. Automobile Chamber of Commerce Bulletin of Feb. 1924 on "Transportation and Taxes"), it is time to consider the reduction of taxation on automobiles rather than ways and means of increasing it.

042.3223 Decision based upon 042.3221 and 042.3222.

042.33 Decision as between 042.3 (a) and (b) versus 042 (a) and (c).

042.4 Highway traffic control, being a function of government by whatever agency it is exercised, should not be taxed by any other form or agency of government.

042.5 Fixed charges, being the cost of hiring capital or of protecting it, except in instances where the State or its subdivision obtain loans for running expenses under emergency conditions, should be met by taxation which supplies capital, namely, general taxation. That proportion of fixed charges due to meeting extraordinary expenses for highway traffic control operation might reasonably be charged to the kind of taxation which meet the operating expenses of highway traffic control.

042.51 Points for the affirmative side.

042.52 Points for the negative side.

042.53 Decision based on 042.51 and 042.52.

042.6 Executive action needed to make effective the decisions reached.

042.7 Legislative action needed to make effective the decisions reached.

042.8 Legal problems requiring the solution of judicial decision before the objectives can be reached.

043. Tests of the need for change or improvement in traffic control system.

043.001 Present and probable future state of public opinion.

(001) Statistics on accidents, volume of traffic, serious of congestion, frequency and duration of congestion, comparative tax rates and property valuations in other communities with and without the advantages proposed.

043.002 Who will benefit most and least and who will pay the most and least?

3 Tangible public advantages of change.

4 Intangible public advantages of change.

5 Arguments advanced for the change:

51 Sound arguments of weight;

52 Arguments of small weight or doubtful quality;

53 Unsound arguments;

54 Important points in rebuttal of negative side.

6 Arguments advanced against the change:

61 Sound arguments of weight;

62 Arguments of small weight or doubtful quality;

63 Unsound arguments;

64 Important points in rebuttal of the negative side.

7 Decision on the basis of 043.005 and 043.006.

8 Legislative and executive action necessary.

9 Legal decisions required before proceeding.

043.1 Balance between cost and value.

.2. Ability of the community to pay the cost.

.3 Merit of developing existing organization and methods versus change.

.31 Adequacy of present organization and capacity for expansion.

.311 Adaptability to future requirements.

.312 Changes necessary incident to expansion.

043.313 When will the law of diminishing returns begin to apply to organization as now constituted?

31 What are the remedial measures, if any.

32 Adequacy of present methods.

321 In what way are they deficient?

322 Can the desired results be accomplished in a less drastic manner than in that proposed? How?

323 Are the methods in vogue basically palliative or remedial?

324 Are they adaptable to future requirements?

325 Do the present methods or those proposed offer the more promising lines for new developments?

050. TRAFFIC CONTROL ORGANIZATION. The Logical Means and Agencies for the Development of Highway Traffic Control - A Suggestion.

050.00 The ownership element. The American public.

050.001 National organizations (of stock holders) for the promotion of traffic control.

050.0011 President of national organization.

050.002 State organizations (of stock holders) for the promotion of traffic control.

050.003 County organizations (of stock holders) for the promotion of traffic control.

050.004 Local organizations (of stock holders) for the promotion of traffic control.

050.010 National headquarters organization.

050.011 The legislative power vested in Congress.

050.012 The executive power vested in the President and executive departments within their normal functions.

050.013 The judicial power vested in federal courts.

050.014 The directive management power vested (and which might be vested) in the Interstate Commerce Commission.

Functions appropriate to the I.C.C.: Broad general plans, limited in detail to that which is necessary
(a) To give head and leadership to the work of lower elements, particularly the States; (b) To unify aims, main objectives, principles and methods; (c) To conduct research and investigation for the whole or jointly with the State Commissions; (d) To afford an agency for the adjustment of administrative differences between State Commissions not affecting rulings upon inter-state traffic upon application from the parties at interest.

050.10 Regional organization by a group of States associated by State treaties effected by and with the consent of the federal organization. Precedent: State treaties for the division of Colorado River water rights. Occasion: Thru route interests, like those of the Lincoln Highway or on some mountain pass, gorge or canon route. This would be an infrequent used link in the chain of traffic control agencies.

- 050.20 State headquarters organization.
- 050.21 Legislative power vested in the State legislature.
- 050.22 Executive power vested in the governor and executive departments within their normal functions.
- 050.23 Judicial power vested in the State courts.
- 050.24 Directive and administrative management vested in the State Highway Commission or Public Service Commission. For the sake of brevity, substitute S for 050.24.
- S010 Headquarters organization.
- S011 Chief or president of the state commission. The usual subdivisions already shown under 022.4011 are omitted here for the sake of brevity.
- S02 Highway Traffic Control Section of state commission
- S021 Highway Circulation Dept., corresponding to Operating Dept. in R.R. organization. This department would be in liaison with the Highway Construction Section of the state commission, would be the channel of contact with the county and municipal traffic control organizations and the predominating department to about the extent and in the ways in which the operating department in R.R. is the dominant influence. Personnel of this department should have police power of the traffic brand only.
- S022 Information and Plans Department. This department would gather information from all available sources, evaluate it and supply intelligence bulletins upon the state of the highway and of traffic. It would conduct highway inspections (not for highways under construction), highway capacity and terminal capacity surveys, make traffic counts, investigations and plans. Its personnel should be made up of trained highway transport engineers.
- S023 Highway Maintenance Dept. This department would maintain all highways of the federal and state system after they had been turned over by the Highway Construction Section.
- S024 Highway Traffic Department, corresponding to the Traffic Department of railways. This would be the department of relations with the travelling public.
- S025 Communication Department. A department for the technical handling and maintenance of communications by other means than mail. In many cases the state organizations would not experience a need for this department because of finding that it was preferable to depend upon the service of existing public service companies.

- 050.30 County headquarters organization. In many cases this link of organization would not exist or be only partially developed. Subdivide as under 050.20 to the extent necessary.
- 050.40 City headquarters organization. Organization of this link would vary greatly according to the size and character of the city. Subdivide as under 050.20 to the extent necessary. When borough organization in a metropolitan district is necessary, carry out organization in the manner indicated below.
- 050.44010 Headquarters organization City Traffic Commission. For = C010 the sake of brevity, substitute C for 050.44.
- C10 Borough or community headquarters organization. Pattern after 050.40.
- C20 District or zone headquarters organization. Pattern after 050.40.
- 050.46 Executive municipal action needed to make effective the organization shown under 050.40 to 050.44 inclusive.
- 050.47 Legislative municipal action needed to make effective the organization shown under 050.40 to 050.44 inclusive.
- 050.48 Legal problems requiring the solution of judicial decision before the organization can be perfected.
051. Personnel for highway traffic control.
- 051.1 Types required.
- 051.101 Directive management type. The transport executive type.
- 051.11 Operative management type. Operating transport engineers.
- 051.12 Investigative and planning type. High. transport engineers.
- 051.13 Highway maintenance type. Highway maintenance engineers.
- 051.14 Traffic department type, with the sales and service characteristics predominating.
- 051.16 Traffic police types not above the sergeant's grade. Personnel in this class to be eligible for promotion by examination and recommendation to other classes.
- 051.15 Communications type, with the necessary vocational and professional training to fill the several grades as required.
- 051.19 Clerical type for clerical and office administrative positions.

051.2 Sources of personnel supply. For types, see 051.1.

051.201 Must be developed on the job or by adaptation from other transport control and traffic control positions.

051.21 Must be developed on the job or by adaptation from other transport or traffic operative positions. While an engineering training is not essential for this type, it confers a great advantage. Engineers to be successful in this capacity must place results NOW by expedient or otherwise above delayed perfection. Recruits from civil and mechanical engineering graduates specializing in highways, highway transport and automotive engineering and from vocationally trained personnel of unusual adaptability.

051.22 Recruited from engineering sources described above.

051.23 Recruited from highway engineers and vocationally trained personnel of unusual adaptability.

051.24 Recruited from sources named above and from vocationally trained salesmen of technical capacity.

051.25 Recruited from the sources for communications personnel.

051.26 Recruited from the present sources for traffic police.

051.29 Recruited from the present sources for clerical forces.

For information concerning the general qualification required of the higher types of personnel named above, see "Preliminary Topical Outline of the Economics of Highway Transport" by Lewis W. McIntyre, 1922, pages 12-15, published by the Highway & Highway Transport Education Committee, National Research Council. This reference also give information on qualifications, duties, positions open, range of salaries and opportunities in the competing fields of highway engineering and construction and highway contracting, also highway transport engineering and operation in public and private service. The highway traffic control field is yet too undeveloped to admit of a paralleling of the information given in this reference.

052. The Future of Highway Traffic Control.

052.1 Highway factors. Quotations below are from above reference

052.11 "Increasing mileage of good roads will bring greater use of the motor vehicle.

052.111 More extensive use by farmers.

052.112 More rural motor express lines.

052.113 Rural post trucks used by Post Office Department.

- 052.114 Use by railroads to replace non-paying branch lines."
- 052.115 More rural motor bus lines, also inter-urban lines.
- 052.116 More sight-seeing and picnicing char-a-bancs.
- 052.117 More tourist traffic.
- 052.118 "Development of separate high speed and heavy traffic roads between congested centers.
- 052.1181 Revival of toll roads on private rights of way".
- 052.119 New features of highway construction.
- 052.1191 Elimination of grade crossings.
- 052.1192 Elimination of sharp turns at corners and corner jogs.
- 052.1193 Elimination of narrow and weak bridges.
- 052.1194 Elimination of grades and saturated subsoil spots.
- 052.1195 Reduction of danger by improving field of view and warnings.
- 052.1196 Elimination of low bridges, other overhead obstructions, and factors causing bottle necks in highway capacity.
- 052.1197 Construction of traffic by-passes and circumferential streets.
- 052.1198 "Improved terminal facilities.
- 052.1199 Heavy and light traffic streets" extended and improved.
- 052.2 Highway transport factors.
- 052.21 Freight factors.
- 052.211 Used by railroads to
- 052.2111 "Replace non-paying branch lines".
- 052.2112 Eliminate small terminals on land of extra high valuation in favor of cheaper terminals farther out.
- 052.2113 Make store-door pick-ups and deliveries.
- 052.2114 Eliminate part of the local way freights by eliminating about 70% of the way freight stops thru parallelling main lines with way freight trucks, thus relieving congestion on main railway lines.
- 052.2115 Make interline transfers at terminal cities of L.C.L. freight.

052.2116 More readily abandon or extend service in accordance in accordance with changing needs.

- 7 Increase the area of territory tributary to existing rail lines. Former railroad rule that branch lines tapped territory ten miles on either side of the track in animal transportation days now changed to twenty five miles. For example of branch lines built into unoccupied territory on parallel lines and 20 miles apart to develop the territory, see railroad map of northern Minn, and N. Dak. When branch lines 50 miles apart will develop the country, much capital expenditure is saved.

052.212 Increasing the strength of ~~or~~ public carriers employing the highway and improving the character of service rendered in:

- 21 Interurban haulage;
- 22 Interurban express;
- 23 Rural haulage;
- 24 Rural express;

052.213 Changing the character of the territory served by trunk line highways.

- 31 Industrializing decadent residential areas.
- 32 Developing raw material sources which could not be profitably handled by other means.
- 33 Developing districts which cannot be profitably developed by railways.
- 34 Increasing the truck gardening and small fruit bearing areas within market distance.
- 35 Increasing the value of land for general farming, cattle raising, dairying, etc. by enlarging neighboring markets and making access to them easier.
- 36 Making areas not penetrated by trunk line highways, or at least good secondary roads, more isolated and less desirable.

052.22 Passenger factors.

- 21 Used by steam and electric roads to:
 - 211 "Replace non-paying branch lines".
 - 212 More readily extend or abandon service in accordance with changing needs.

052.2213 Increase the area of territory tributary to existing rail lines. See 052.2117 above.

4 Give more frequent service.

5 Carry their service into urban districts in which the tracks and greater noise of rail traffic would be both objectionable and very expensive. Example: City of London proper. See "The Planning of a Modern City" by Nelson P. Lewis.

052.222 Increasing the strength of public carriers employing the highway and improving the character of service rendered in:

21 Interurban motor bus service;

22 Rural motor bus service;

23 Sight-seeing and picnicing char-a-banc service;

24 Service to and from summer and winter resorts and recreation places;

25 Cooperative service with inland waterways.

052.223 Changing the character of the territory served by trunk line highways.

31 Conversion of hamlets and farming lands into suburban residential districts.

32 Changing the areas of high values and rentals for residential purposes from territory contiguous to commuters' rail lines to territory accessible only or most conveniently by private car. The motor bus as a counteractive influence.

33 Making small village and farm life more attractive thru removing the isolation of inhabitants from other people.

34 Increasing the contact of the city dweller with country life.

35 Bringing educational facilities within reach of larger numbers by suburban development and thru the rural community school bus.

36 Helping to make the "melting pot" melt by breaking up the exclusiveness and isolation of city foreign colonies.

37 Tending to increase public health by increasing the out-of-door life of the people.

060. INTERRELATIONSHIP OF HIGHWAY, RAILWAY, WATERWAY AND AIR
TRAFFIC CONTROL.

060.00 GENERAL CONSIDERATIONS AFFECTING ALL TYPES OF TRANSPORT.
(Quotations are from "Preliminary Topical Outline of the Economics of Highway Transport by Lewis W. McIntyre, page 17, published by the Highway & Highway Transport Education Committee, National Research Council.

060.001 "Transportation a service of a public nature.

- 11 Unified system necessary. See 'Motor Truck Transportation', F. W. Davis, Eng. News, V. 85, pp. 1194-5.
- 111 Error in past has been in concentration on one type for a time.
- 1111 One type cannot profitably be favored above others.
- 1112 Danger of overestimating value of highway transportation. 'Freight Movement by Motor Trucks from Viewpoint of Carrier and Public', H. E. Yound, Western Soc. of Engineers' Jnl., V. 26, pp. 204-9.
- 112 Compare with factory.
- 1121 Large machines for some processes.
- 1122 Small machines for other processes.
- 1123 From raw material to finished product and thru sales to consumption of product, processing and transportation steps alternate.
- 1124 The factory and the transportation device are tools of constant capacity which are adaptable only by economic loss or adjustment to meeting fluctuating demands.
- 1125 When developed to meet peak demands, taxes and fixed charges frequently become ruinous.
- 1128 Little hope of widespread public understanding of these immutable economic principles. Safety of the investment lies in substantial recognition which these principles have already received in the Constitution of the U. S. and decisions thereunder and in the laws of the land.
- 1129 Tendency of personal income tax returns and increasing popular investment in public utility stocks to widen the grasp of these principles is highly encouraging.

060.0012 "Rehabilitation of transportation the pressing problem of the country.

- 21 Waterways fallen into comparative disuse in spite of liberal public expenditures.
- 22 Very few railroad stocks above par.
- 221 Freight cars carry only half of their capacity"
- 222 Freight cars in motion only about 10 per cent. of the time in an average month. See p. 2, "Freight Terminals and Trains," John A. Droege, 1912, McGraw-Hill Book Co.
- 223 On an average about 7 per cent. of a railroad's freight cars are in the repair shop. See p. 2, "Freight Terminals and Trains".
- 224 Time of freight cars in yards and terminals. One of largest roads testified in a meeting of Ass'n of Transportation & Car Accounting Officers that average time on its line was found to be 18 hours, had been reduced to 13 and they hoped ultimately to get down to 5 hours. See p. 9, "Freight Terminals and Trains".
- 225 A principal factor in railway congestion is failure to unload cars promptly.
- 2251 While same amount of storage space can be built for about one fourth of cost of freight car and maintained for one fifth cost of freight car maintenance, it is frequently cheaper to hire freight car storage at demurrage rates with car resting on high priced but convenient railroad land than to pay city storage and extra transfer costs.
- 226 225 means needless investment of millions in R.R. capital and constant car shortage except during periods of depression. Freight rates must pay taxes and fixed charges on idle equipment during both depressions and boom times.
- 227 Too many yards where "all tracks lead into it and none run out of it". See p. 9, "Freight Terminals and Trains".
- 23 "Electric systems largely in the hands of receivers.
- 24 Motor transportation retarded by lack of road development.
- 241 Burden of taxation.
- 242 Adverse legislation."

060.00243 Infancy of highway transport industries. Period of small, weak, inexperienced companies making many imprudent investments and, while in existence, engaging in ruinous competition.

4 Need of franchise legislation to insure dependable service at reasonable rates with freedom from irresponsible cut-throat competition.

5 Inexperience of public service commissions with the economic values and limitations of highway transport.

6 Traffic congestions and bad terminal and unloading facilities as a financial drain on new weak highway transport companies.

060.0025 Air transport dependent upon government development.

51 Commercial air transport experiencing very indifferent and slow development under government subsidies in Europe. Almost non-existent in America.

52 Airplane factories dependent upon government business.

53 General feeling that marked development will come but present outlook quite discouraging.

54 Expense of landing facilities and traffic control stations on air route one of the retarding factors.

060.002 Comparative Traffic and Mileage of different types.

21 Freight traffic in ton miles: (I.C.C. figures for R.R. for 1921. Motor figures from U.S. Bureau of Public R.
211 Railroad traffic - 306 755 332 000.

212 Motor truck traffic - 6 479 200 000.

213 Railroad tonnage carried - 1 642 251 000. tons

214 Motor truck " " 1 430 000 000. "

215 Great Lakes & Miss. R.-1918 90 000 000. "

22 Passenger traffic: (Same sources as above)

221 Railroad passenger mileage - 37 329 114 000.

222 Motor car " " - 70 820 000 000.

223 Railroad passengers carried - 1 034 315 000.

224 Motor car " " - 6 990 862 000.

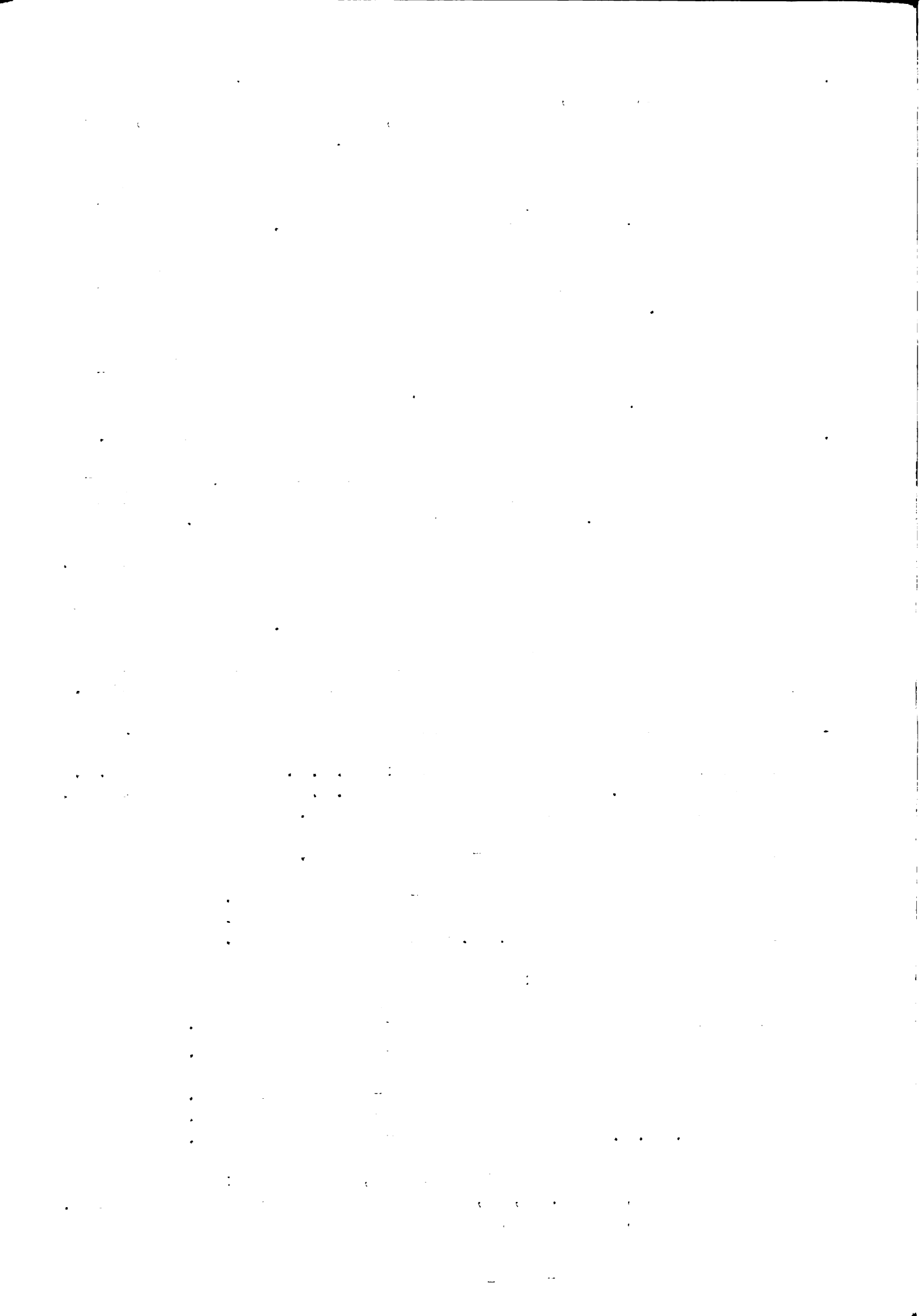
225 Elec. R.R. " " - 16 000 000 000.

23 Transportation channel mileage, main line:

231 Railroad, incl. 2, 3, & 4th trackage - 270 859 miles.

232 Highways, improved, exclusive of cities 350 000 "
" unimproved

233 Navigable waterways 2 500 000 "
15 000 "



060.003 "Government Subsidization.

- 31 Railroads - Land grants to early railroads.
- 32 Highways - Entire cost should not be charged against transport. Tendency toward charging even all maintenance to transport of motor type is of doubtful justification. See 042.32229 above. Motor transport had early misfortune to be regarded as a luxury. Penalty of the name "pleasure car" still clings in taxes.
- 33 "Waterways - Continual large governmental appropriations due to popular value attached to port facilities as means of developing home industries and interests, which survives from pre-railroad days in spite of the retrogression of waterway transport.
- 34 Airways - Practically all development thus far has been governmental, mostly military but some for air mail service. Airplane factories developed at government expense as a national defense measure during World War.

060.004. "Comprehensive plan needed. See 'Traffic & Transportation A. H. Blanchard, Canadian Eng., V. 40, pp. 129-31"; "A National Motor Transport Service" - coordinated with railways and waterways, Major B. Taylor, Q.M.C., Jour. S.A.E., May 1923: "Coordination of Highway Transport", James Dalton, Automotive Industries, Nov. 15, 1923, p.983-92, on the work of the special committee of the Chamber of Commerce of the U.S.

060.01 A Comprehensive Highway, Railway, Waterway and Air Traffic Control Plan should cover: correlation of all forms of traffic control for the purposes of:

- 11 Handling routine traffic demands;
- 12 Handling the natural growth of traffic;
- 13 Handling periodic variation therein, due to:
 - 131 Seasonal conditions;
 - 132 Business conditions, such as those arising from:
 - 1321 Economic conditions;
 - 1322 Temporary effect from weather conditions;
 - 1323 Adjustments to the habits of the people in seasonal buying, travelling, congregating for temporary purposes, observation of holidays and national customs.

060.014 Handling extraordinary variations in traffic due to:

- 41 Public gatherings of unusual and overtaxing size for recreational, historical or political reasons;
- 42 Epidemics;
- 43 Catastrophes, such as great conflagrations, tornadoes, earthquakes, floods, etc.
- 44 Disturbance of the public peace by:
 - 441 Rioting;
 - 442 Insurrection;
 - 443 Invasion by armed enemy;
 - 444 Foreign war.
- 5 Fostering the development of unproductive sections by the most economical means.
- 6 Aiding in the reduction of transportation costs and the elimination of duplications of service.
- 7 Reducing the time of transit, thus reducing shrinkage, waste, spoilage, and fixed charges on capital tied up.
- 8 Reducing breakage, damage, and pilferage in handling and conserving time, money, timber and other materials now employed for a higher grade of packing and crating than is necessary under the attainable average of conditions. Example: Savings effected by the unit container idea.
- 9 Reducing traffic congestion by reducing the large amount of misplaced traffic.



070. TRAFFIC ENGINEERING AND COMMUNITY (CITY) PLANNING.

070.000 INTERRELATIONSHIP OF TRANSPORT AND COMMUNITY (CITY) PLANNING.

- 11 Transport and community planning as orderly developments from riotous growth of communities and transportation
 - 11 The general situation in perspective:
 - 111 The first period - Haphazard development.
 - 112 The second period - The inception and development of order.
 - 113 The third period - Extremes in theories and ideas.
 - 114 The fourth period - Solid and sure progress.
 - 115 In which stage are we today in our most advanced thought? In which stage is the local problem under consideration? Are the stages in the two fields in step?
 - 2 Public service character of each.
 - 21 Community planning essentially an official and public spirited service.
 - 22 The organization of transportation leads to public carrier service.
 - 23 Growing use of private transportation tends toward improved public spirited observation of traffic regulations and community development plans.
 - 24 Corporation discipline in public carrier organizations gradually submerges the rampant individualism of the employee and he acquires a capacity for cooperation.
 - 25 This development of the spirit of teamwork is the civilian counterpart of the results from military discipline. Gradually there will accrue to the civilian traffic control situation a considerable part of the great advantages which military traffic control experiences, namely, those flowing from a closely knit, well disciplined organization.
 - 26 Privately owned and operated transportation will welcome the opportunity to conform to the methods which get results for organized transport.
 - 27 Public opinion in traffic control matters is molded by the owners of private transportation and the management of public carriers.

- 070.003 Vital influence of transportation upon character of community growth.
(Quotations which follow are from "Preliminary Topical Outline of the Economics of Highway Transport" by Lewis W. McIntyre, 1922, pages 23 & 24.)
- 31 "Life of a community tends to crystalize in centers. 'Municipal Engineering Practice', A. P. Folwell. John Wiley & Sons.
- 311 Wholesale and retail district.
- 312 Amusement and educational centers. 'The Planning of a Modern City'; Nelson P. Lewis,
- 313 Park and playground area. See above reference.
- 3131 Park units should be connected.
- 314 Warehouse and factory districts.
- 315 Freight and passenger terminals.
- 316 Residence communities.
- 317 Effects of over segregation, with particular reference to traffic problems.
- 3171 Theaters and needle trades of New York City."
- 3172 Financial districts in New York and Boston.
- 3173 Stockyards district in Chicago.
- 32 "Zoning laws.
- 33 Intercommunication between centers. See references under 070.0031 and 070.00312 above.
- 331 Rectangular system.
- 332 Diagonal system.
- 333 Radials and circuits.
- 334 Topography and contour plan.
- 34 Ideal transportation system must provide:
- 341 Easiest means of reaching each center.
- 342 Easiest means of passing thru each center.
- 343 Easiest means of avoiding a center entirely by a by-pass route. See 'City Building and Transportation', J Rowland Bibbins, Western Soc. of Eng., Vol. XXV, No. 12, Aug. 20, 1920.

070.0035 Expediency often overweighs careful planning. See above reference.

51 Pittsburgh 'hump removal' of only 14 feet.

52 San Francisco rebuilt without betterment of its street plan.

53 New York with three pieces of subway under Broadway.

54 Cleveland permitting disruption of the 'Mall Plan'.

55 Disruption of the 1807 plan for the development of Detroit, made after the 1805 fire. Expensive corrective measures now employed by Detroit. See "The Planning of a Modern City", Nelson P. Lewis.

36 "Problems of transportation in cities must be considered as a whole."

61 Problems of the electric railways.

62 Problems of the waterways and port.

63 Problems of the steam railways.

64 Thru traffic problems.

65 Local traffic problems.

66 Problems with traffic originating or terminating.

67 Highway transport as the medium of adjustment and solution.

671 "Trucking. See 'Joint Report of the N.Y., N.J. Port & Harbor Development Commission', Chap. 17, Part II." Chap. VII, 'Ports and Terminal Facilities', MacElwee, McGraw-Hill Co.: Chap. I, XII, XVI, XX, XXI, & XXV, "Freight Terminals and Trains", Droege, McGraw-Hill Co.

6711 "Truck livery.

6712 Pick-up and delivery. (Merchants and laundry delivery).

6713 Trucking express.

6714 Freight transfer and haulage contracting.

672 "Terminal warehouse and dock congestion..

6721 Losses thru excessive haul.

6722 Losses thru vehicles waiting.

070.00³6723 Losses thru freight being buried in freight house.
"Come again tomorrow".

- 4 Losses thru late arrival. "No freight received after 4:30 P.M."
- 5 Losses thru excessive handling due to congestion in freight house. Loss, damage and pilferage.
- 6 Time losses of freight in yards and freight houses. See 060.0022 and subdivisions, 060.00246, and 060.017-3-9.
- 7 Losses from faulty billing, packing, crating, boxing, and marking.
- 8 Losses from careless and indifferent loading, handling, exposure to weather, fire hazards, etc.

070.00³673 "Store-door delivery with

- 31 Unit containers." "The Container System of Freight Transportation", Ry. Age, V. 69, No 13, Sept. 24, 1920, pp.515-517, 3 fig.
- 32 "Demountable bodies. See 'The Motor Truck as an Aid to Business Profits', S. V. Norton, Chap. VIII.
- 33 Nest bodies or other containers.
- 34 Individual hampers.
- 35 Platform lifting warehouse trucks.
- 36 Belt conveyors
- 37 Gravity loading and unloading systems.
- 38 Box lifters.
- 39 Power winch with falls and net.

070.00³674 Improvements in terminal warehouses, docks and platforms, also in team tracks and facilities and approaches thereto.

- 41 Warehouse location, and design.
- 42 Terminal layout with special consideration for rush hour service and freight movement.

070.00³675 Merchants' delivery and package transport".

- 51 Pooled service economies.
- 52 Gasoline haul to delivery and pick-up districts with electric or animal distribution and pick-up trucks.

Practice of Marshall Field & Co., Chicago. See also "Motor versus Horse Traffic" p. 11-12, "Motor Road Transport for Commercial Purposes", John Phillimore, Sir Isaac Pitman & Sons, Ltd., and "Advantages of Electric Transport", p. 78-79, same reference; also "Observations on Horse and Motor Trucking", Pender & Thomson, Bul. 3, Elec. Eng. Research, Mass. Inst. of Tech., 1913: "Relative Fields of Horse, Electric and Gasoline Trucks", H. F. Thomson, Bul. 4. Elec. Eng. Research, Mass. Inst. of Tech., 1914.

070.004 The community plan involves great economies or wastes.

- 41 Merits and faults have a widespread effect as to persons and interests and are far reaching in point of duration and cost of correction of faults.
- 42 Importance of adherence to basis principles at expense of elimination of non-conforming structures.
- 43 Convenience and economy in the traffic plan not inconsistent with economical, sanitary and asthetic considerations in building construction and other developments.

070.005 Community planning and traffic planning are engineering problems.

51 Engineers are the logical men to solve these questions.

070.0 History. Progress and Development.

(For "The Development of Highway Traffic Control", see 010.

070.010 History, Progress and Development of Community Transportation.

0101 Waterways.

0102 Steam railways.

21 Long haul systems.

22 Gathering and distributing short haul lines.

0103 Electric railways.

31 Horse car predecessor.

32 Cable car predecessor.

33 Surface street railway.

34 Elevated street railway.

35 Subway railways.

36 Trackless trolleys.

070.0104 Highway transport.

- 41 Sedan chairs and palanquins. Porters. Cargadores.
- 42 Jinrickshas. Wheeled chairs. Push chairs.
- 43 Animal passenger transport.
- 431 Dog or reindeer teams.
- 432 Elephants, camels and miscellaneous animals.
- 433 Saddle horses and mules.
- 434 Two wheeled vehicles.
- 435 Four wheeled vehicles.
- 436 Sleighs, cutters, etc,
- 44 Animal freight transport.
(Subdivide as under 070.01043).
- 45 Steam power vehicles.
- 46 Electric power vehicles.
- 47 Internal combustion power vehicles.
- 471 The passenger automobile.
- 472 The truck.
- 473 The tractor.
- 474 The motorcycle
- 475 The omnibus.
- 48 The bicycle and the tricycle. The velocipede. Wheeled
- 49 The trailer.

070.0108 Passenger and freight elevators.

070.0109 Miscellaneous types. Mono rail. Pneumatic tubes.

070.011 Traffic control as an after-thought of transportation development.

- 11 Economic values of traffic control.
- 12 Economic limitations on traffic control. See 043. and subdivisions.

070.012 Community planning as an after-thought of transportation development.

- 21 Economic value of community planning.
- 22 Economic limitations on community planning.

- 070.0123 Human relations factors in the development of the community plan. Life, liberty and the pursuit of happiness.
- 31 Public health and sanitation. Food, shelter and clothing
 - 32 Comforts of home and family.
 - 33 Opportunities for relaxation, recreation, rest.
 - 34 Opportunities for entertainment and communion.
 - 35 Educational opportunities.
 - 36 Gainful employment under favorable conditions.
 - 37 Spiritual, inspirational and devotional opportunities.
 - 38 Participation in civic and political activities.
 - 39 Aesthetic considerations.
- 070.0124 Business considerations as factors in the community plan, aside from all considerations of the transportation factors.
- 070.1 Technical correlation of transport control and traffic control.
- 11 Traffic control studies made as the basis for correlation of all types of transportation, See references under 060.004 above.
- 070.2 Correlation of transport and traffic controls with community (city) planning.

100. HIGHWAY TRAFFIC. CONTROL AND THE PUBLIC.

- 110. The **Broad Fundamental** "Law of the Road" Arising from Customs and the Statutory Law. From the standpoint of popular knowledge, recognition and custom.
- 111. The **Paramount Interest** of the **Public Convenience**.
 - 111.1 Principle of the Greatest Good for the Greatest Number.
 - 111.11 (Obverse) The exclusion of usurpation and of special privilege to the detriment of the public interest.
 - 111.12 Sub-principle of Equal Opportunity for **All**.
 - 111.2 The Right to Regulate Traffic in the Public Interest.
 - 111.3 The Right to Regulate Public Carriers and Servants.
 - 111.4 The Public's Right to Safe and Peaceful Transit over the Public Highway.
 - 111.5 The conception that the pedestrian has a practically unqualified right of way over the non-pedestrian.
 - 111.6 Customs and Courtesies of the Highway **Developed by Usage** before the Memory of Man.
 - 111.61 Keeping to the right.
 - 111.62 Passing to the left.
 - 111.63 Consideration for the party with the heaviest load or the timid and untrained horse.
 - 111.64 Waiting for the first to enter upon a narrow bridge, causeway or defile to pass.
 - 111.65 Aiding those, in so far as one's ~~own~~ interest admit, who have been subjected to the misfortunes of travel and storm.
 - 111.69 Miscellaneous customs.
 - 91 Nationally observed.
 - 92 Of sectional observation.
 - 93 Of local observation only.

- 120. THE PRACTICE OF HIGHWAY TRAFFIC CONTROL. (The tactics or applied science of traffic control).
- 121. Traffic Customs and Rules Developed by Usage within the Memory of Man.
 - 121.1 Rules of the Road governing moving traffic.
 - 121.11 Slow vehicles move in the curb traffic lane; Faster vehicles in central lanes.
 - 121.12 Bicycles not allowed on sidewalks.
 - 121.13 Hand signals by drivers. Johnson Oil Refining Co. v. Galesburg, etc. Power Co., 200 Ill. App. 392.
 - 121.14 Lighting systems and lamp signals.
 - 121.141 Dim headlights and show courtesy light to left in passing at night.
 - 121.15 Make left hand turns around center post of cross roads. Basis of the "Gyratory or Rotary System" at circles.
 - 122. Registration of Vehicles, Drivers, Owners, and Enterprises.
 - 122.1 Legal and regulative restrictions as to vehicles.
 - 122.11 Types of vehicles.
 - 2 Dimensions of vehicles
 - 3 Weights of vehicles.
 - 4 Types of accessory equipment.
 - 41 Alarm devices - horns, bells, whistles, etc.
 - 411 Elimination of unnecessary noise.
 - 412 Allotment of alarm devices to classes of vehicles according to priority claim on the right to free passage.
 - 4121 Emergency public and public service vehicles.
 - 4122 Vehicles of preferred priority.
 - 4123 Vehicles of ordinary priority.
 - 42 Lighting equipment.
 - 421 Physicians' red cross light.
 - 43 Brake equipment.

122.144 Tire equipment.

- 41 Solid rubber tires.
- 42 Cushion rubber tires.
- 43 Pneumatic tires.
- 431 Fabric type.
- 432 Cord type.
- 433 Balloon type.
- 47 Steel tires.
- 476 Steel tires with cleats.
- 48 Anti-skid devices.
- 5 Bumper and fender equipment.

122.2 Legal and Regulative Restrictions as to Drivers.

- 21 Age, physical and mental capacity.
- 211 General requirements.
- 212 Personal history as to accidents, records of traffic convictions, etc.
- 213 Classes debarred from registration - Idiots, imbeciles, epileptics, insane, paralytics, blind, deaf, etc.
- 22 Mental and practical driving requirements.
- 221 Ability to use and understand English.
- 222 Ability to read and react quickly to road signs.
- 223 Does use of colored signal lights necessitate tests for color blindness?
- 224 Knowledge of rules and courtesies of the road.
- 225 Practical driving tests.
- 226 Knowledge of causes of highway accidents and proper action in emergencies to avoid accidents.
- 229 Miscellaneous requirements.

122.3 Legal and Regulative Restrictions as to Public Carriers.

- 123. Legal and Regulative Restrictions as to Enterprises Conducted upon the Highway, Including Franchises.
 - 123.1 Illegal enterprises.
 - 123.2 Restricted enterprises and industries.
 - 123.21 Limitations on character of cargo.
 - 123.211 Limitations on explosives and inflammables.
 - 212 Limitations on dimensions of loads - structural steel, poles, pipe, hay, barrels, baskets, lumber, etc.
 - 213 Limitations on the handling of live stock, etc.
 - 123.22 Limitations on use of highway for commerce and gain.
 - 221 Prohibited use of streets and highways.
 - 222 Merchandizing and commerce restrictions.
 - 2221 Licenses for peddlars and hucksters.
 - 2222 Milk, ice and fuel vending permits.
 - 2223 Canvassers' permits.
 - 2224 Permits and identifications for persons soliciting funds.
 - 2225 Advertising and display restrictions. See Fifth Ave. Coach Co. v. New York City, 221 U.S. 467.
 - 22251 Signs, sign boards, etc.
 - 22252 Street exhibitions, demonstrations intended to promote trade, business and the vocations of entertainments and amusement.
 - 22253 Street parades for the same objects.
 - 2229 Miscellaneous permits.
 - 223 Restrictions on public celebrations on the highway and on parades not for profit.
 - 224 Public service installations other than railroads or other public carriers.
 - 225 Railroads, elevated, surface or subway.
 - 226 Public carriers operating by means other than railroads.
 - 123.3 Special franchises to public carriers.

123.31 Periods of franchises and of renewals.

32 Considerations for granting franchises.

321 Monetary considerations, including taxes, fees, etc.
especially stipulated by the franchise.

3211 Annuity return, based on flat rates, profits, revenue,
or other premises.

322 Right of public to acquire property at stated times.

323 Stipulations as to rates, when fixed for the period of
the franchise.

324 Stipulations as to the manner of public regulation of
the business in accord with the public interests.

3241 Regulation of the issues of securities.

3242 Rate regulation on the basis of "a fair return on the
fair value" of the prudent investment devoted to the
public service.

3243 Character of service to be rendered.

3244 Stipulations relative to the extension and withdrawal
of service in accordance with needs.

3245 Responsibility of franchise holder for damages for:

32451 Injuries to persons, including employees, passengers
and others.

32452 Loss or damage of baggage, property and goods of pa-
trons.

32453 Same for other persons using the street or abutting
buildings and lands.

3246 Engagement as to sharing the expense of bridging, pav-
ing, grade separation improvements, etc.

3249 Miscellaneous provisions.

33 Rights accruing to holder of franchise.

331 General legal rights which hold without specification
in the franchise itself. Example: Right to "a fair re-
turn on the fair value".

332 Rights specifically secured by the franchise.

3321 Right to acquire partial or complete monopoly on the
business.

3322 Security from unfair and uneconomic competition.

123.3323 Permission to employ the right of eminent domain.

(Transfer the following to the 123.331 group)

123.3311 ***** nor shall any person be subject ***** to be deprived of life, liberty, or property, without due process of law: nor shall private property be taken for public use, without just compensation". 5th Amendment to the Constitution of the U.S.

33111 Right to "a fair return" on the fair value of the property, useful and used by the company, at the time of inquiry". City of Houston v. Southwestern Bell Telephone Company, Advance Opinion of U. S. Supreme Court, May 29, 1922.

See also Smyth v. Ames, 169 U.S. 466, March 7, 1898, p. 546; Willcox v. Consolidated Gas Co., 212 U.S. 19, Jan. 4, 1909, p. 50; Minnesota Rate Cases (Simpson et al v. Shepherd, 230 U.S. 352, June 9, 1913, p. 434; Brooklyn Borough Gas Co. v. Public Ser. com. for 1st Dist. of N.Y., P.U.R. 1918F, July 1918; Lincoln Gas and Elec. Light Case, 250 U.S. 256, June 2, 1919; and Chap. VI, Depreciation of Public Utility Properties, H. E. Riggs, 1922, McGraw-Hill.

331111 Right to recover from rates the reasonable depreciation, as distinguished from decretion, (including obsolescence). See last reference cited above.

3312 Right to peaceful and orderly pursuit of business.

3313 Share in the common guarantees of freedom from harmful and unwarrantable molestations from disturbers or enemies of the public peace.

124. Time and Seasonal Restrictions of General Application to Moving Traffic. For application in specific cases, see 127.2.

124.1 Seasonal limitations.

2 Limitations incident to construction and repair.

3 Hours during which specified classes of traffic are permitted.

31 Store door pick-ups and deliveries.

311 Of passengers.

312 Of freight.

32 Railway freight traffic.

33 Railway passenger traffic.

124.34 Omnibus traffic.

35 Motor truck traffic.

36 Traffic to and from public markets.

37 Street cleaning, sanitary measures, scavenging.

38 Construction or maintenance by city or public utility forces.

39 Street vendors and other miscellaneous traffic.

125. Parking.

125.010 Origin and derivation of term: "It is uncertain whether the word is originally Celtic or Teutonic; it is probably Teutonic, connected with *par*, a bar, perhaps with original initial *s-*, and so ultimately connected *spar*, a bar, beam, etc. Related in origin to Irish Gaelic *pairc* = Bret. *park*, French *parc*, W. *park*, *parwg*, also Teut., E. *parrock*, also *paddock*, etc." Century Dict.

020 Definitions.

021 "Military term (a) The space or inclosure occupied by the guns, wagons, animals, pontoons, powder, provisions, stores, etc., when brought together, or the objects themselves: as, a park of artillery, of provisions, of wagons, etc." Always carrying the two ideas: of things having a considerable degree of mobility and of being but temporarily halted in a compact arrangement favoring rapid resumption of movement. "(b) A complete set or equipment, as of guns, tools, etc.: as, a park of siege guns".

Verb: "To bring together in a park or compact body as, to park artillery". Century Dict.

022 Civilian usage seems to be derived from military usage since the advent of the automobile. In civilian usage the idea of organizational connection with other vehicles is usually absent but the individual vehicle is frequently "parked" in the vicinity of other vehicles and in a space allotted or deemed to be suitable for such grouping.

From the legal standpoint of enforcing parking laws and regulations, two phases assume special importance,
(a) How long a halt is necessary to constitute parking? Is the stopping to pick up or discharge a passenger or item of cargo, parking? If not, how long a delay after the completion of such an act is necessary before the act of parking has been committed? Is it essential that the vehicle halt at, near, or beyond the curb line? If so what dimension governs? What part does intent of the driver play?

124.022 (b) Is a vehicle "parked" within the meaning of the law and regulations, when a person is left in the vehicle (the driver or another person), or, when the engine is left running idle? In so far as military practice has any bearing upon the case, it may be added that military parks are never left without guards or persons on duty as watchmen or overseers. It is contrary to military regulations to permit an engine to run idle for a longer period than 1 minute.

124.1 Parking off the highway right of way:

11 In garages:

111 On the first floor;

112 On other floors.

12 In open spaces, with or without shelter.

2 Parking on the highway right of way:

21 Curb parking, one side only:

211 Parallel to curb;

212 At an angle to the curb;

213 Perpendicular to the curb.

22 Curb parking, on both sides.

221 Parallel to curb;

222 At an angle to the curb;

223 Perpendicular to the curb.

23 Center parking:

231 Parallel to the main traffic stream;

232 At an angle to the main traffic stream;

233 Perpendicular to main traffic stream.

24 Parking in gores and places not employable for traffic lanes;

241 Parallel to main traffic stream;

242 At an angle to the main traffic stream;

243 Perpendicular to the main traffic stream.

125.3 Parking space and regulations peculiar to common carriers.

.31 Off the highway right of way.

.32 On the highway right of way:

.321 Curb parking, one side only;

.322 Curb parking, on both sides;

.323 Center parking;

.324 Parking in gores and places not employable for traffic lanes.

.4. Parking space and regulations adapted to the special rights of abutting property owners. Subdivide, when necessary as under 125.3 and 125.2.

.45 Can the abutting property owner grant at will his special privileges to his patrons? To the patrons of his tenants? See 126., and 230.

.5 Does the right of the adverse user apply to parking? See 126., and 230.

126. Legal and Regulative Restrictions of Highway Traffic Control Adapted to the Rights (a) of Abutting Property Owners, and, (b) of the Adverse User.

126.020 Definitions.

.021 Abutting property owner: Owner of property (land) which abuts or joins the highway.

.022 Adverse user: "If the public or a party use a piece of land or a way thru or over land in a certain way or for a certain purpose, they will after long usage, usually 21 years, acquire a right to continue to use the land or way, in spite of the owner's objections. Such rights are termed adverse or prescriptive rights. In such case the boundaries are restricted to the land actually occupied or used, for the full period."

.023 User adverse the State: "Adverse use or possession cannot be had against the State or government; so that persons and the public cannot deprive the State from asserting at any time its rights in property, unless by special act of legislature such rights are given to the public or to abutting land-owners." See "The Legal Status of Highway Boundaries and Disposal of Surface Waters," by John C. Wait, Better Roads, Aug. 1916; also abstracted in Am. Highway Engrs' Handbook, A.H. Blanchard, 1919, p. 350-6, John Wiley & Sons.

126.024 Law of Public Policy: "The law that prevails with respect to boundaries of roads and ways does not exist solely because the abutting owner ever did own to the center of the street, but is based upon public policy. All American and English courts recognize the existence of a rule or presumption that a conveyance of land bounded on or by a highway passes to the grantee a title to the center of the way. The difference in the opinions of the courts arises from the application of the ~~general~~ rule. The rule is founded upon a policy which tends to guard against inconveniences of the most alarming character. If such a rule were not adopted, confusion would arise and titles would not be secure." See two last references above.

- .1 Effect of above principles on use of highway incident to building operations.
- .11 Erection of construction scaffolding, fences (hoardings).
- .12 Piling and storing building materials.
- .13 Employment of derricks, hoisting engines, etc.
- .18 Responsibility of owner, contractor, etc., individually and separately for safety of passing public.
- .2 Status of encroachments pertaining to buildings - Basements under sidewalks, coal holes, fuel tanks, door steps, awning posts, hitching posts, overhead or subsurface passageways, overhead signs, streamers and flags.
- .3 Status of advertising material, sidewalk counters and stands of both abutting owners and squatters, private "No parking" signs, etc. See 125.4 and 125.5.
- .4 Husbandry in highway a privilege of abutting owners. Planting crops, trees or shrubs, pasturing animals, etc. Conditions under which limitations can be effected.
- .5 Disposal of waste materials on the highway right of way or removal of materials. Status when natural drainage is modified thereby.
- .6 Disposal of surface waters under the:
 - .61 Civil Law, in southern and some middle States;
 - .62 Common Law, in northern and eastern and some western States.

127. Traffic Control on Restricted Highways.

127.01 Speed limits applicable to restricted highways.

.011 Speed limits for designated traffic lanes.

.02 Physical limitations on specific routes:

.021 Ruling grades for vehicles of various classes.

.022 Limiting effect from the character of the surface.

.023 Dimensions of maximum clearance profile.

.024 Maximum capacity limitations of bridges, etc.

.025 Seasonal limitations due to weather.

.1 Restrictions arising from terms of dedication.

.2 Time and seasonal restrictions on moving traffic limited in application to specific routes.

.21 Seasonal limitations.

.22 Limitations incident to construction and repair.

.23 Hours during which specified classes of traffic are permitted. Subdivide, when necessary, as under 124.3.

.3 Traffic class restrictions:

.31 Animal drawn traffic excluded.

.32 Motor trucks excluded. Subdivide, when necessary by tonnage or other classification.

.33 Traction engines and (or) tractors excluded.

.34 Motorcycles excluded.

.35 Omnibusses excluded.

.36 Passenger cars, public and (or) private, excluded.

.37 Trailers excluded.

.38 Bicycles, velocipedes, etc. excluded.

.39 All vehicular traffic excluded.

127.4 Sign control of restricted routes.

.41 Prohibitory and penalty signs relative to 127.01, 127.2, 127.3, 127.5, 128. and subdivisions of said numbers.

.42 Warning signs relative to hazards of the way, 127.02,

127.2, 127.3, 127.5, 128. and subdivisions of said numbers, etc.

127.4201 Speed limit signs.

.4202 Warning signs relative to physical limitations.

.42021 " " " " grades.

.42022 " " " " change in surface.

.42023 " " " " "Low Bridge", etc.

.42024 " " " " bridge capacity, draw-bridge etc.

.42025 " " " " washouts, "bridge gone", etc.

.42026 " " " " "Bad Curve!", etc.

.421 " " " " dedicatory restrictions.

.4221 " " " " seasonal restrictions.

.4222 " " " " Construction and repair, including use of red lanterns

.4223 " " " " classes of traffic restricted at certain hours.

.423 " " " " permanent traffic class restrictions.

.424 " " " " traffic interference.

.4241 " " " " railway grade crossings.

.4242 " " " " highway intersections.

.4243 " " " " traffic lane stripes.

.4244 " " " " school and hospital zones.

.425 " " " " traffic direction.

.4251 " " " " "One Way Street. Do Not Enter" (Commonwealth v. Nolan (Ky) 224 S.W. 506).

.4252 " " " " two way streets.

.4253 " " " " traffic lanes. "Slow vehicles keep to the curb".

.43 Parking and "No Parking" signs for:

.431 Vehicles in general.

.432 Public carrier vehicles.

.433 "Reserved for (vehicles of special class or purpose).

127.44 Safety zone and pedestrian passageway signs.

.45 Dummy policemen.

127.5 Effectiveness of highway traffic control on restricted road with not more than occasional police supervision, and with traffic choosing its own route and time. Rural and small town type.

.51 Civilian traffic.

.511 Unorganized. Everybody for himself.

.512 Semi-organized - Occasional short convoys or large percentage of traffic from public carrier companies.

.513 Organized traffic - Street parades and processions.

.52 Mixed civilian and military traffic without military police control. - Conditions near camps and cantonments

.53 Military traffic alone without military police control.

.6 Same as 127.5, except with traffic allotted to roads but not operating under established priorities. A common form of military highway traffic control when the density of traffic is low. Subdivide, when necessary, as under 127.5.

Note: A "restricted route" in military traffic control almost always means that the route is "restricted" only thru being allotted to certain organizations. The customary restrictions, except those arising from physical conditions, would be ignored whenever the pressure of military necessity demanded.

128. Highway Traffic Control on Guarded or Police Controlled Routes.

128.1 Police employing extemporized signal equipment or hand signals.

.11 Traffic choosing its own route and time. Rural and small town type.

.111 Civilian traffic.

.1111 Unorganized. Block system of filling and emptying the street space within one or more city blocks. Compare with 127.511, 127.611, 128.1211, 128.1311, 128.133, 128.138, 128.2211, 128.2311, 128.233 and 128.238. Visualize the step by step process by which the highest type of highway traffic control is built up from the elements. Note carefully the elements which enter into the making of this highest type, 128.238.

- 128.1112 Semi-organized. Occasional short convoys or large percentage of traffic from public carrier companies.
- .1113 Organized traffic - Street parades and processions.
- .112 Mixed civilian and military traffic with police control. Conditions near camps and cantonments, or under martial law. Point at which civilian and military traffic are almost identical.
- .113 Military traffic alone under military police control, but not in formation. A state demoralizing to discipline.
- .114 Mixed troops marching and mixed transport. A neglected state which promptly results in establishing traffic control. This borders on chaos. The reduced results obtained from limited highway capacity and the great fatigue to troops forces improvement of method, hence further development at this point in the direction following 128.124 would be purely visionary.
- 128.12 Traffic allotted to roads but not on established priorities. A common form of military highway traffic control when there is medium to high traffic density.
- .121 Civilian traffic. Civilian traffic control when the segregation of classes of traffic is highly developed.
- .1211 Unorganized. See 128.1111 and comparison cited there.
- .1212 Semi-organized.
- .1213 Organized traffic.
- .122 Mixed civilian and military traffic.
- .123 Military traffic, not in formation but alone. An unusual case involving the presence in one place of large number of staff cars and messengers. Usually found only in the immediate vicinity of a large headquarters.
- .124 Mixed troops marching and mixed transport.
- .125 Troop movements.
- .1251 Mixed troops with combat and field trains. A very common condition to which military highway traffic control is applied.
- .1252 Foot troops marching. Very uncommon for large bodies of foot troops to be alone on the road.
- .1253 Mounted troops with combat and field trains.
- .1254 Foot troops riding in motor transport convoys. A common situation for distances of from 10 to 150 miles.

- 128.1255 Foot and mounted troops (including animals) in motor transport convoys. Not a usual method for troop movement.
- .126 Animal transport columns. Common when conditions are distinctly unfavorable to motor transport.
- .127 Mixed animal and motor transport columns. A condition always to be avoided.
- .128 Solid motor transport columns.
- 128.13 Traffic allotted to roads and scheduled according to road priorities. The highest type of military traffic control practicable on rural roads.

Subdivide as under 128.12. Subdivision omitted in the interest of brevity.

- 128.2 Police employing permanently installed high grade signal equipment. The most advanced type of city highway traffic control. Equipment seldom available for military traffic control. See "A Comparison of Military and Civilian Highway Traffic Control", M.L. Ireland, Major, Q.M.C., U.S. Army, pp. 21-25, Quartermaster Review, Jan.-Feb., 1924, also item 423, p. 26, Automotive Abstracts, Feb. 1924.: "Military Traffic Control", same author, Journ of the S.A.E., Feb. 1920.

In order to simplify the complexity of arrangement which would result from carrying out in detail all possible combinations of signal equipment with all the various operating conditions enumerated in the subdivisions of 128.1, it is best to handle the signal subdivisions in parentheses as form numbers, as follows:

- (S1) Bell systems, for hand and distant operation.
- (S2) Hand operated "Stop" and "Go" signals.
- (S21) Isolated "Stop" and "Go" signals
- (S22) ~~Signs~~ ^{Signals} placed in group at nearby corners.
- (S221) Signals used to control short sections of main routes only.
- (S222) Signals used to control a main route of considerable length.
- (S223) Signals used to control the highway net of an area.
- (S23) Signals placed in a large group, larger than (S223).
- (S231) Operation uncoordinated.

- (S232) Signals operated semi-independently by the scheme of filling and emptying the street space within one or more city blocks. Sometimes called the block system. "Block system" is also used in the railroad sense as the section of track between "blocks" (signals). This is probably the most common form of city highway traffic control with signals.
- (S233) Signal operation coordinated by separate signal system between policemen. This is rare for, if one is going to install a signal system to coordinate the several policemen operating hand signals, he is likely to go the full distance in up-to-date installation and have the signals visible to the public as well as to the police.
- (S3) Semaphore system without lamps. Subdivide, if necessary, like (S2). This type of installation would be rare, being applicable only to places at which there was a certainty that the semafores would not be used at night.
- (S4) Colored light signals, with or without flag arms (semafores)
- (S41) Isolated light signals. Roadside reflectors and "blinkers".
- (S42) Light signals placed in a group at nearby corners.
- (S421) Signals used to control short sections of main routes only.
- (S422) Signals used to control a main route of considerable length.
- (S423) Signals used to control the highway net of a small area. Few installations have gone beyond this stage.
- (S43) Light signals placed in a large group, larger than (S423).
- (S431) Operation uncoordinated. An improbable situation.
- (S432) Signals operated semi-independently. See remarks under (S232). The more common method of light signal operation at present.
- (S433) Signal operation controlled for a considerable area from a central point. Police at intersections enforce compliance with signals but have nothing to do with operation. Signals must be adapted to being instantly operated by method (S432) when system gets out of order.

Employ signal system number, as (S433) with number showing traffic conditions, as 123.233, to show the particular combination of conditions which applies in any specific case. Note that the combination of these two numbers represent shows the acme of modern highway traffic control, the kind which the traffic control expert dreams of as being ideal for producing results.

- 128.21 Police employing permanent high grade signal installation with traffic choosing its own route and time. Indicate type and method of signal operation thus: 128.21(S433). This is the highest practicable type of city traffic control until public opinion recedes from its too thoughtless acceptance of the idea that the police must cope with whatever is thrust upon them.

THE REPUTATION AND SUCCESS OF THE COMMANDING GENERAL DEPENDS UPON THE RATE OF PROGRESS OF MILITARY TRAFFIC.

THE REPUTATION AND SUCCESS OF A MAYOR DOES NOT DEPEND UPON THE EFFICIENCY OF TRAFFIC CONTROL IN HIS CITY.

Subdivide 128.21 as under 128.11. Subdivision omitted in the interest of brevity.

- 128.22 Police employing permanent highgrade signal installation with traffic allotted to roads but not on established priorities.

This is the highest practicable type of city traffic control attainable after the public grasps the advantages of overcoming our greatest traffic sin of tolerating misplaced traffic. The principle which we now violate every day is: "KEEP CARGO AND PASSENGERS AWAY FROM THE PLACES WHERE THEY DO NOT NEED TO BE". See "Traffic Control Problems", Major Mark L. Ireland, Q.M. C., U.S. Army, pp. 368-9, 2 fig., jour. of the S.A. E., Apr. 1924.

Subdivide 128.22 as under 128.12. Subdivision omitted in the interest of brevity.

- 128.23 Police employing permanent high grade signal installation with traffic allotted to roads and scheduled according to road priorities.

Subdivide 128.23 as under 128.12. Subdivision omitted in the interest of brevity.

- 128.238(S433) The unattainable ideal of the traffic control expert. Unattainable in civilian traffic control because traffic is unorganized and cannot be made to run on schedule. Unattainable in military traffic control because political and commercial animosities draft the Army to settle what they have started and cannot stop. Therefore circumstances, rather than design, selects the field for military effort and fails to provide a fine signal system on the right spot.

180. Coordinated highway, waterway, railway and airway traffic control. The vision beautiful toward which all traffic control experts look with yearning and hope and for inspiration.

130. THE PUBLIC WELFARE.

130.001 Statistics, general.

131.. Effects of highway traffic control on accidents affecting the public health, including the bearing of the adequacy of supply of food, shelter and clothing.

132. Effect upon the home and family.

133. Effect upon relaxation, recreation, rest and content.

134. Effect upon opportunities for entertainment and communion.

135. Effect upon education.

136. Effect upon gainful employment, cost of living, economic progress and wealth.

137. Effect upon inspirational, devotional and spiritual life.

138. Effect upon civic and political activities and progress.

139. Effect upon the asthetic sense and cultural progress.

140. THE PUBLIC ATTITUDE. ITS BEARING UPON FUTURE DEVELOPMENTS.

140.1 Present public habits.

140.11 Attitude toward "Law of the Road".

140.12 Attitude in the matter of courtesy to others met on the highway and sidewalk. Progressive or decadent?

140.13 Observance of traffic laws and rules.

140.14 Individualism. Restiveness under the restraints of regulation. Would public opinion in past decades have accepted the restraints of present day regulations?

140.15 Instinct for playing safe and avoiding hazards. Is the habit of taking chances a vice or a virtue of the national character.

140.16 Capacity for self government. Amenability to police direction aimed at the greatest good for the greatest number. That ideal as the test of measures proposed from time to time.

140.17 The inertia of the public to new ideas is the surest test of their merit.

141. Public Opinion, as expressed in:

141.1 Publications:

141.11 The non-class publications.

141.12 The class publications:

.121 Labor publications.

.122 Financial and business publications.

.123 Educational publications.

.124 Religious publications.

.125 Technical publications.

.2 By the spoken word;

.21 The man on the curb stone.

.22 Business men and in their Ass'ns.

.23 Efforts of the schools to teach safety precautions.

.24 In the church and pulpit.

.25 By technical men and societies.

.26 In political speeches and campaigns.

.3 Expression of popular movements.

142. The State of Public Feeling.

142.1 Evidences of the trend.

142.2 Directions in which progress is steady.

142.3 Directions in which public feeling oscillates, pendulum-like.

142.4 Psychology of the public upon traffic control matters.

143. The State of Public Knowledge. See 110. for popular knowledge, and recognition of the "Law of the Road"; also 200. The Legal Phase, for technical jurisprudence.

143.001 Statistics.

143.01 The results of surveys. What are the indicators?

143,1 Centers of information for advancement of learning.

- 143.11 Governmental centers of research and investigation.
 - .12 Technical and scientific centers.
 - .13 Commercial and industrial centers.
- 143.2 Centers of intelligence for the dissemination of learning.
 - .21 Governmental centers.
 - .22 Educational commissions and societies.
 - .23 Educational institutions.
 - .24 Commercial and industrial centers.

144. Public Action.

For technical jurisprudence, see 200. The Legal Phase

- 144.1 Results on referendum questions.
- 144.2 Local community ordinances.
 - 144.21 Ruling of local public service commissions.
 - .22 Police regulations on delegated authority.
 - .3 State legislation.
 - .31 Rulings of state public service commissions.
 - .4 Federal legislation.
 - .41 Rulings of the Interstate Commerce Commission.

200. THE LEGAL PHASE.

210. THE SOURCES OF HIGHWAY TRAFFIC CONTROL AUTHORITY.
History, Progress and Development of Highway Traffic
Control Authority.

- 210.1 Theories as to the origin of principles and customs surviving from remote antiquity.
- 210.11 Early tribal military control and protection of the highway.
 - .12 Gradual transfer of prerogatives of military chieftains over the highway to the crown.
 - .13 Medieval and modern trend of prerogatives from the crown to the people, altho nominally continuing to rest in the crown, as in Great Britain.
 - . History of principles derived from:
 - .2 Roman law.
 - .3 Anglo-saxon sources.
 - .4 Norse sources.
 - .5 Norman and French sources.
 - .6 British common law.
 - .7 Spanish American sources.
 - .9 Miscellaneous sources.
- 211. Evolution of the precedence of the right of the State over the rights of the public and the individual.
 - 211.1 Right of Eminent Domain.
 - .13 User, public or private, may not adverse the state. See 126.023.
 - 212. Dominance of public convenience over private.
 - .1 Principle of the Greatest Good for the Greatest Number.
 - .11 Right of adverse user. (Obverse)
 - .11 Exclusion of usurpation and special privilege to the detriment of the public interest. (Reverse)
 - 213. Police Power of the State.
 - 2130 Prerogatives of the State derived from police power.

213.1 Responsibilities of the State under police power.

.11 Public right to free and safe use of the highway. (Obverse)

Guarantees of freedom from harmful molestations from disturbers or enemies of the public peace.

.111 Modern balance which must be struck between freedom and safety.

214. Rights of abutting owners.

215. "Law of the Road".

220. ANALYSIS OF LEGAL SOURCES OF HIGHWAY TRAFFIC CONTROL JURISPRUDENCE.

220.0 Common law sources.

.1 "Law of the Road".

.2 Judicial notice of customs and "Law of the Road".

221. Constitutional sources.

222. Legislation.

222.1 Federal enactments.

222.2 Legislation by States.

222.3 Community and municipal legislation.

223.1 Rulings of the Interstate Commerce Commission.

223.2 " " State public service commissions.

223.3 " " community authorities.

224. Police regulations by delegation of authority.

225. Judicial decision:

.1 By federal courts.

.2 By State courts.

.3 By lower courts.

230. HIGHWAY LAW OF TODAY.

(Expansion postponed for further investigation and study.)

240. THE PROFESSION AND PRACTICE OF HIGHWAY LAW.

(Expansion postponed for further investigation and study).

250. THE TREND OF HIGHWAY TRAFFIC CONTROL JURISPRUDENCE.

"Tendencies in Legislation" from Huddy on Automobiles,
6th Edition, 1922.

"The automobile legislation in the United States was originally framed upon the theory of regulation, in so far as registration requirements were concerned. In some of the States there has been a disposition to exact revenue from the automobilists under the licensing power of the government. The revenue features of the automobile laws, so far as they interfere with the right of transit from State to State, are clearly unauthorized, since the police powers of the State do not permit such taxation. (Gran dallv. Nevada, 6 Wall. (U.S.) 35, 13 L. Ed. 745.

The New York motor vehicle law of 1904 has been widely copied throughout the Union. This statute has, however, proven to be inadequate and has since been amended.

Effort has been made to persuade Congress to enact a Federal automobile registration law on the theory that interstate travel for pleasure constitutes interstate commerce. This has failed. It is doubted that interstate automobile travel constitutes interstate commerce, but it is suggested that such a measure might be within the domain of Congress if framed upon the theory of protecting interstate commerce actually carried on over interstate highways.

One of the developments in motor vehicle legislation has been the appearance of a movement to have enacted uniform automobile laws in the various States. Such laws would greatly facilitate interstate touring and commercial travel but it hardly seems possible to have many States enact the same kind of motor vehicle law, since conditions are different in different jurisdictions. Moreover, the registration and license fees adequate for one state would under certain conditions, due to the number of automobiles and the location of the State, be insufficient for another State. Precise uniformity in automobile legislation throughout the United States does not, however, at the present time, seem reasonably probable.

Tendencies in Judicial Decisions.

That the courts reflect public sentiment is well known. This is as it should be, provided no positive rule of law is warped or violated, since public sentiment is most always right. However, the courts should not blind their eyes to reason, and, merely because there happens to be some local and temporary agitation concerning the automobile, due to an automobile collision, for example, manifest the slightest prejudice against the

automobilist. All of the courts of the United States before whom the question as to whether the automobile is an agency dangerous per se, have emphatically held that it is not per se dangerous. The Appellate Division of the Supreme Court of New York has declared that the automobile is not more dangerous per se than a carriage. The sound judicial tendency has been to enlarge the motorist's rights, consisten with the safety of the public."

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