

TRAFFIC CONTROL

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IT is nearly 400 years since the forerunner of the modern car first appeared. It was built by a Nuremberg watchmaker named Hautsch who claimed that it was self-propelled and could travel at 2,000 paces an hour. However, it transpired that the motive power was provided by two men in the interior, pedalling vigorously. But the car did have some unique features such as a dragon's head at the front which squirted water on anybody in the way, and two mechanical angels which gave warning of approach by raising bugles to their lips and blowing loudly. On rainy days we can still be squirted by a moving vehicle and some of the horns still sound like bugles.

Since the advent of the automobile around the beginning of the 20th century, it has been found necessary to devise methods of controlling this increased traffic. It was about 1917 when the city of Detroit installed the first traffic control tower. At the present time, it is estimated that there are about 70,000 signalized intersections in the United States. The average citizen is sure that the traffic signals are always timed against him. In Syracuse, New York, a traffic official who was responsible for timing the signals received a phone call from a certain politician who claimed that the red light burned three times as long on the street he used as on the other. A second politician who used the other street at this intersection maintained just as forcefully that the red light shown three times as long on his street. This is an example of some of the problems encountered by a traffic engineer. What was this man to do? He had made a careful traffic survey, thus determining the proper split for this particular signal. He decided to wait, not changing the timing of the signal. A few days later he contacted each politician separately, asked him how he liked the timing of the signal as now operating. Each politician said the new timing was perfect and thanked the traffic engineer for his prompt attention.

The purpose of traffic control is to promote the safety of moving vehicles and pedestrians. It also insures that the available street space will be used as efficiently as possible. The desirability of traffic control was illustrated a few years ago when the Mayor of Colorado Springs, Colorado, decided the city could save money by turning off its signals during the off-tourist season. The city electrician had this order submitted to him in writing, then turned off the signals on a Sunday night, locked the control boxes and with the keys in his pocket left on a fishing trip. The next morning, Colo-

rado Springs was in a terrific traffic snarl. Accidents and confusion occurred at all formerly signalized intersections. Officials managed to open the control boxes and put the signals back in operation.

There is a wide variety of traffic controls. We have our Motor Vehicle Laws which have been written for the safety of the drivers and pedestrians as a paramount consideration. All of us should know, and periodically review the Motor Vehicle Laws of our state. I have with me a small pamphlet entitled, "The Driver's Manual," published by the Department of Motor Vehicles of the State of Connecticut. All those interested in having a copy of this resumé of the Motor Vehicle Laws are welcome to it. Each one of us would find it beneficial to re-read this pamphlet periodically.

Another form of traffic control is traffic signs. Regulatory signs are those which tell the driver how he shall operate his car when in motion such as: STOP, KEEP RIGHT, DO NOT ENTER, SPEED LIMIT, ONE-WAY signs, etc. Included in this classification also are the parking signs, which describe the parking limits, no parking zones, loading zones, etc. Another type is the warning sign which advises the motorist of sharp curves, intersecting streets, railroads, narrow bridges, hills, poor road conditions, proximity of children, etc. All these signs are erected for the safety of the motorist and should be heeded. Guide signs include direction signs to certain cities and towns, route numbers, detours, etc. The safety of the motorist and the pedestrian would increase considerably were all of us to obey these different types of signs implicitly. Many apparently believe that the speed limit signs posted on our highways are for minimum instead of maximum speeds. These speed limits have been established after careful survey by those responsible for their erection. Drivers frequently forget that those living along highways have children which may run into the road unexpectedly. Those driving within the speed limit are much more apt to avoid an accident and possible fatality.

Traffic paint is a useful form of traffic control. Henry Barnes, Director of Traffic of Baltimore, Md.—the highest paid traffic engineer in the United States—says that more control can be effected with a bucket of paint than in any other way. Who will deny that the white center line on our highways is a most useful guide, especially when driving at night. In the city, the capacity of streets and intersections can be increased considerably with the use of center lines and lane lines thus inducing the drivers to form multiple lanes in each direction instead of only one lane. Stop lines, which are usually about 12 inches or more wide, show the driver the safe place to stop at a signalized intersection or a stop street. Painted crosswalks indicate to the pedestrian the safest place to cross main streets and warn the driver of the possibility of pedestrians. Occasionally paint is used to paint signs on the pavements to indicate the proximity of schools and to designate left-turning, straight through, and right-turning lanes. Curbs are painted

yellow to designate bus stops, loading zones, and occasionally no parking zones. This traffic paint may have small glass beads imbedded in the paint or the beads may be dropped on the surface of the wet paint. These beads reflect light and are especially useful at nighttime to emphasize these lines.

Recently, a plastic type of white line has been developed by an Englishman and during the past year or so has been introduced to this country. This type of line can be laid on black top or concrete surface. It is considerably more expensive than traffic paint but lasts several times as long. It is not affected by sand and salt used on our pavements during snowstorms, as is the traffic paint. I understand that the State of Connecticut is running tests on this plastic material. We have not, as yet, made any application in the city of Hartford.

On expressways and parkways and some busy city streets, medians are used to separate the opposing lines of traffic. Confusion at some complicated city intersections is frequently eliminated by the use of channels and pedestrian islands. Wide open intersections with no definite indication to the driver of his proper location within the intersection increases the probability of accidents. We have used medians, channels, and pedestrian islands in the city of Hartford. Pedestrians are appreciative of these isles of safety wherever installed. Our improved pedestrian accident picture in the city of Hartford is due considerably, I am sure, to the use of these islands in conjunction with our "Walk, Don't Walk" signals which will be mentioned later.

The adoption of one-way streets is being adopted more and more in cities throughout the United States. In some cities a heavily traveled street may be one-way in one direction during the morning rush period and one-way in the opposite direction during the afternoon peak period. Cities have also adopted one-way grid patterns in busy sections. In the central business district of Hartford, Ann Street and High Street are complimentary one-way north-south streets respectively. State Street and Asylum Street, from Market to Ford Streets, have been one-way westbound for a number of years. The city has recently adopted an alternate one-way system for north-south streets in the Park Street area. These were narrow streets ranging in width from 23' to 30' between curbs with parking permitted on both sides of most streets. With continuous parking on both sides, the maintenance of two-way traffic was difficult. It was desirable to maintain as much parking space as possible, hence the decision to make these streets one-way.

During the afternoon peak period from 4:00 to 6:00 P.M. weekdays, Asylum Street, from Farmington Avenue to Woodland Street in Hartford, is one-way westbound. It handles a tremendous volume. Without this arrangement, the city could not possibly handle the heavy westbound flow

at this time. It is anticipated that additional one-way streets will be adopted in Hartford as the need arises.

Heavily traveled streets, which efficiently accommodate an an odd number of lanes, can have what is called a reversible lane. This lane would be in the center of the street and would be in one direction during the morning peak period and in the opposite direction during the afternoon peak time if the volume of flow so dictated. The direction of this reversible lane would be indicated by overhead traffic signals placed directly over the individual lanes. Another method of indicating these reversible lanes is by raising or lowering a movable median. This has been done successfully on one of the expressways approaching the center of Chicago.

The police officer is a very important factor in traffic control. Traffic regulations are of no use whatever unless obeyed by the public. Enforcement of the parking regulations and of the rules governing moving traffic is the duty of the Police Department. Parking regulations are made to improve the flow of traffic. Any violation tends to decrease the capacity of our streets. Certainly the narrow streets of our older cities must be used to their maximum capacity for moving traffic. The \$1.00 fine now used in Hartford for each parking violation, no matter how many are committed by a single individual, is not effective in reducing these parking violations. At the present time, the adoption of an ordinance providing for an increased fine as the number of violations per individual increases, is being urged. On some of our east-west streets from 4:30 to 6.00 P.M., tickets are being issued to illegally parked cars for impeding traffic. This involves an appearance in Traffic Court and usually a heavy fine. The Police Department attempts to tow away these vehicles parked so as to impede our heavy afternoon traffic movement.

In a modern interconnected signal system, the police officer should be used to see that the signals are obeyed by the drivers and the pedestrians as well. He should see that the intersections are not blocked by over-anxious drivers. In a system of this type, it is not desirable for the officer to operate the individual signals by hand. These signals are so timed to provide progressive movement and to give all drivers an equitable opportunity to pass through an intersection.

Police are used extensively in Hartford to protect school children at difficult intersections. This is done even at signalized intersections. It is unfortunate that drivers have a tendency to ignore pedestrians, even school children, for whom they should have special consideration.

Traffic signals are an indispensable form of traffic control. In the early days when first adopted, there was considerable difference of opinion concerning their construction. I am informed that one of the early traffic signals in the city of New Haven, Connecticut had the green on top instead

of on the bottom as is now standard. The man in charge of traffic in the city at that time was an Irishman.

There are a variety of traffic signal controllers. There is the fixed time controller, which requires a given number of seconds to complete a cycle, that is, from the start of the green signal on the main street until the green signal is again shown on this street. The split or the green time given to each street at an intersection is adjustable on the controller dial. An added refinement of the fixed time controller is the addition of two or three dials to this one controller, each dial varying, for example, the split of the green time, or providing an advance green for one street to accommodate left turns, or illuminate "Walk, Don't Walk" signals or cutting them out during periods of light pedestrian loads. These changes from one dial to another can be accomplished by an electric clock at the individual controller, or in a so-called interconnected system, by a master controller supervising a series of intersections.

By properly timing individual controllers operated by synchronous motors, it is often possible to provide progression, that is uninterrupted flow of traffic on a main artery. If, however, there is an interruption of power in any one controller, it is thrown out of synchronization with the other intersections in the system.

In an interconnected traffic signal system, a master controller supervises the local controllers of the system. This prevents any individual controller getting out of step with others in the system. In an interconnected system, the master controller can change dials on the individual controllers at pre-determined times of the day or week, thus accommodating the traffic control to traffic loads which have been previously determined. On our Main Street system in Hartford, for example, the master controller turns off all the "Walk, Don't Walk" signals about midnight and turns them on again about 6:00 A.M. The master controller on our interconnected Farmington Avenue signal system is not only able to vary the percentage of green time at individual intersections, but also varies the length of cycle throughout the system, thus accommodating itself to varying volumes of traffic throughout the day.

The traffic actuated signal is a comparatively recent development. The city of Hartford has quite a few of these installations and it is anticipated that many more will be made. The cars themselves, within limits, control this type of signal by running over pressure sensitive detectors or magnetic detectors as they approach the intersection. This type of controller, in many instances, assures the most efficient use of an intersection. It operates as follows: cars constantly approaching an intersection can keep the green light for themselves as long as there are no large breaks between adjacent vehicles. If a vehicle is lagging behind and a demand for the green signal has been made by a vehicle on the opposing street, the green signal auto-

matically changes. It must be noted, however, that the green signal will not remain indefinitely for a given street if there is a constant demand. A maximum time can be set for each street. These actuated controllers may be semi-actuated, that is with detectors on the side streets only, or two, three, or four phase actuated.

The latest type of traffic signal controller involves a combination of actuated and fixed time devices. Detectors on the main street record the traffic flow in each direction. These detectors send impulses to a controller which automatically registers the traffic flow and supervises a fixed time interconnected system in such a way that the heavier traffic flow can be favored over the flow in the minor direction. During the past two years, the city of Hartford has installed quite a few of the "Walk, Don't Walk" type of pedestrian signal. From February 15, to October 26, 1953, there were 24 pedestrian accidents, including one fatal, before the pedestrian signals were installed. In this same period in 1954, after the installation of the "Walk, Don't Walk" signals, there were a total of 4 pedestrian accidents with no fatalities. This improvement of accident experience is due largely, I believe, to the installation of these pedestrian signals and the observance of them by the public. In our Main Street system, we have adopted the (so-called) scramble system for pedestrians at certain intersections. At these locations, all traffic is stopped and pedestrians have exclusive use of the intersection. During the period the "Walk" signal is illuminated, it is safe to *start* from the curb. When the "Don't Walk" flashes, it is no longer safe to start to cross the street, but sufficient clearance time is provided to adequately clear the intersection before the next traffic movement takes place.

At other intersections in the city there are pedestrian islands part way across a wide street with the "Walk, Don't Walk" signals on the island as well as on the sidewalks. As these locations the pedestrians may walk part way across the street taking refuge on the island until the signal indicates it is safe to complete the crossing. This is done so that some traffic movement can take place all the time and pedestrians can cross other sections of the intersection without conflict with moving vehicles. At some intersections in various parts of Hartford, we have pedestrian actuated signals. At these locations vehicle movement is continuous until a call is sent to the controller by a pedestrian pushing the push button. After a certain interval of time, all traffic is stopped, the "Walk" signal is illuminated, and the pedestrian has exclusive use of the intersection. A few years ago, one of the signal manufacturers in this country attempted to introduce the traffic signal to the South American city of Buenos Aires. A sample signal was installed at one of their busy intersections, one of the streets being a wide boulevard with safety islands in the center. The signal proved to be a challenge to the hot Latin sporting blood. Local hot rods tried constantly to shoot across the boulevard against a red light. If a driver made it against heavy traffic

he was applauded soundly by the populace assembled nearby to enjoy the sport. If he got only half-way and had to take refuge in the safety island area, he drew loud Bronx cheers. The installation proved a failure, nor have any additional installations ever been made in that city. It may seem unlikely that something comparable would be the case in this country; however, I must point out that pedestrians oftentimes have a tendency to disobey our traffic signals, whether they are the overhead suspended type, or the special "Walk, Don't Walk" variety. It seems to me that it is just as important for a pedestrian to obey these signals as for the driver of a car to do so, in fact, more so because a pedestrian is not surrounded by steel armour as is the vehicle driver.

I shall be pleased if I can leave you gentlemen with two important thoughts:

- No. (1) As a pedestrian, it is your duty to yourself to obey the traffic signals.
- No. (2) As a driver, always remember your good driving manners.