

Street Maintenance Trends and Developments Traffic and Parking

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Street and highway traffic parking have long been recognized as a major problem of cities and towns throughout the nation. In many communities it is the number one headache. Inadequate handling of this problem has resulted in blighted areas, decentralization, and decreasing of property values. Every community in the nation regularly experiences a huge economic loss from traffic accidents and congestion of traffic movement.

The development of adequate transportation facilities and traffic control measures requires comprehensive knowledge of the problems to be overcome. A thorough traffic study and survey is inevitable so as to provide safe and adequate means for those persons using the highway system. An intelligent gathering of facts regarding these problems is necessary to provide this knowledge. The analysis of factual data obtained in these studies can provide certain guide lines for the implementation of engineering projects.

Vehicular parking, pedestrian control and protection, elimination of traffic bottlenecks, and the development of an efficient traffic system, are major problems of increasing importance in all communities. The revision of parking time limits to insure most efficient usage of curb space, the creation of off-street parking facilities, the determination of where and what types of pedestrian controls are necessary, and the investigation of the causes of traffic delay and congestion, cannot be based on guesswork. Too much money and too many lives are at stake to permit development of traffic plans and controls by guesswork or by trial and error method. It isn't enough to simply observe what works successfully in one community and apply it in another. There are numerous remedies for a given problem, and the characteristics of the particular problem must be carefully studied in order to determine the most effective remedy. Traffic studies if practical and carefully planned, are valuable not only as a basis for working out specific engineering remedies but also to show important trends in traffic characteristics and transportation demand.

Studies also develop information that can be of aid to enforcement and educational agencies. The police will generally find traffic data

beneficial in planning more efficient selective assignment of enforcement personnel. Traffic survey data properly publicized, stimulates and makes public opinion, paving the way for acceptance of new traffic plans and control. Most traffic studies and surveys will prove beneficial from many other standpoints aside from the primary or engineering standpoint.

Studies and surveys may be either aimed at particular problems of a limited scope, or at collecting broad basic planning data. For instance, a particular intersection or street may require application of one or more studies to determine what safeguards, controls, or new facilities are needed. A typical example would be an intersection where numerous traffic accidents and frequent traffic delays are occurring. It might properly be decided to make the following types of studies: 1) high accident frequency locations, 2) driver observance of stop signs, 3) driver observation of speed regulations, 4) driver observance of traffic signals, 5) pedestrian observation of traffic signals, 6) motor vehicle volumes, 7) pedestrian volumes, and 8) motor vehicle spot speed check.

Basic planning surveys are usually made at intervals of several years. An exception to this statement is the continuous study which is made more frequently. Periodic traffic counts and accident frequency studies are continuing studies of a basic planning nature, which are generally conducted and summarized annually or at more frequent intervals.

Three of the most common types of basic planning surveys are as follows: 1) basic transportation planning survey, 2) traffic safety survey, and 3) parking survey.

Any city or town that is planning on inaugurating a traffic survey should consider the following points: 1) a successful survey is a practical one, this means that the proposed suggestions should be within the economic reach of the community, so that the community is in a position to make some traffic improvements as the survey progresses, 2) the ideal survey is one in which at least initial positive steps have been taken to put the major recommendations into effect before the final report is written. This is a real measure of the surveys value, 3) to undertake a survey without the backing of local organizations such as the administration, the transit company, the Chamber of Commerce, the news media, and other business organizations are more likely to end with the shelving of the final recommendations and report, 4) make certain that those in local government and business who will ultimately have something to say about accepting and putting into effect the survey recommendations, have a definite part in inaugurating the survey. For instance, knowing that the recommendations will involve transit route changes, be sure that the transit commission and the transit company are well represented or at least consulted frequently. Retail business executives and newspaper editors comprise two other groups that generally should be brought into the survey picture at an early stage, 5) cities and towns should obtain

the services of a traffic consultant if they do not have this type of staff within their organization. There is a need to aid in planning the survey and interpreting the findings. It's impossible to provide all the information regarding the details of how the factual material can be interpreted and applied to various local problems.

The basic philosophy for the Fort Wayne Traffic Engineering Department can be categorized into three areas: 1) To strive to produce and make available the maximum number of services for the least investment and the least initial and final cost. Physical entity resulting from creative planning requires perpetual maintenance, therefore such costs are considered in the final analysis. 2) The department continuously attempts to provide, for the public's benefit, the highest level of professional engineering application toward the central function of moving persons and goods safely and efficiently as possible. We have successfully been able to provide this by the development of new engineering techniques. 3) The department has industriously attempted to create and maintain a communication channel between the administration and the public who we serve, to align departmental basic thinking in accord with administration policy making, as well as to streamline the incoming and outgoing interchange of information with the public.

Traffic safety is comprised of three elements known as the three E's, they are: Engineering, Education, and Enforcement. Engineering is the planning, designing, purchasing of right-of-way, and construction of the street or roadway system. Education is the educating of all persons (by various means available), to voluntarily comply to the law, the do's and don't's regarding the rules of the road, etc. This includes planned pedestrian and bicycle safety programs, driver's training course for beginning drivers, and a driver improvement school initiated by the court. Enforcement would include the planned programs of the enforcement agency to apply selective enforcement tactics to bring about various city and state vehicle laws.

The City of Fort Wayne was experiencing throughout the 1970's an average of about 10,500 traffic accidents a year. This included an average of about 22 persons being killed a year. In 1980, it was determined an all out effort would be made to reduce those factual statistics. It was obvious there was a great need for the reduction of traffic accidents and traffic fatalities. This was done in a very systematic manner by certain engineering changes after thorough studies had been made, and by the assistance of the police traffic division and other engineering departments. Improved road maintenance, better snow removal, and additional street lighting were all part of the program. In 1980, the traffic accidents were reduced by 19%. In 1981, a further effort was made and the accidents were reduced by 8%. In 1982, a 7% reduction was realized in traffic accidents. In the three years of the planned program,

total traffic accidents were reduced by 30% and traffic fatalities were reduced by 40%. In 1982, the City experienced its lowest number of traffic accidents (7,575) since 1964, and the lowest number of traffic fatalities (15) since 1976.

Although some people would like to believe the results came from a reduction of trip generation or fewer trips being made by residents in and out of the city, our traffic counts prove this is not true. There has not been a reduction in city traffic volumes between 1980 and 1982. The accomplishments that were made in accident and fatality reduction are the results of a deliberate well-planned, well-organized effort. The story of how the City of Fort Wayne accomplished its promise to the citizens of the community, to provide the best transportation system available, working within the limitation of severe budget restraints so as to reduce traffic congestion is quite a story. The combined efforts of the persons involved, displayed professionalism and dedication that accomplished what seemed to be an impossible goal.

Keep in mind there are approximately 185,000 licensed drivers in Allen County, and approximately 2,500,000 miles being driven per day within our immediate area. The City of Fort Wayne ranks second in the nation in automobiles per capita. With these odds against us, we set out to accomplish our goal in the following manner: Communicating with the motorists is vitally important. There are three available means of doing this, 1) by traffic signs, 2) by traffic signals, and 3) by pavement markings. The flexibility as dictated by the *Manual on Uniform Traffic Control Devices*, sets up the standards for the legal requirements regarding the installation of traffic signs, traffic signals and the application of pavement markings. To be effective all traffic control devices should meet five basic requirements: 1) fulfill a need, 2) command attention, 3) convey a clear, simple meaning, 4) command respect of road users, 5) adequate time for proper response. By following the Indiana Manual on *Uniform Traffic Control Devices*, all non-standard signs and those advertising signs that had been installed in public right-of-way were removed. A study of night time reflectivity of all traffic signs was completed. A sign that looks good in the daytime may be of no value at all as far as its effectiveness at nighttime with the lack of proper reflectivity. A sign replacement program was initiated and followed as funds became available.

The modernization of traffic signals was next on the agenda. The removal of 8 in. traffic signals and span wires replaced with 12 in. signals on mast arms in the central business district was started. So as to reduce the number of roadside hazards, combination traffic signal poles and light standards were used to provide a more effective system and to reduce maintenance costs. The policy was adopted that all traffic signal poles and street light poles should be of a break away type base so that if a

vehicle did leave the traveled portion of the roadway and came into contact with this type of pole it would shear-off thus reducing the severity of the accident. All traffic signal systems must be maintained by skilled and knowledgeable persons that have been trained in the latest techniques and methods in which to maintain the latest type of solid state circuitry equipment. By continuous schooling and in-house training classes our work force was able to maintain a keen sense of knowledge regarding the entire system and the various types of traffic signal controllers in use. The department is responsible for the maintenance of almost 300 traffic signals, owned by the city, the Indiana Department of Highways, and the Allen County Highway Department. Traffic signal light bulbs are replaced on an annual basis, the lenses cleaned, and the reflectors polished. The traffic signal computer system for all traffic signals in the Central Business District was upgraded so as to provide a better progression in traffic flow. The "Signal Timing Optimization Project" based on Transyt 7-F was initiated in 1981.

The city then initiated a program of removing unwarranted traffic signals. The program started in 1981 and to date we have removed 26 unwarranted traffic signals within the city. It is our intent to continue this program with the removal of at least six or eight more. When the program was first started, we were hopeful that we would be able to remove 12 to 14 traffic signals. That number has almost been doubled. The method in which we went about removing the traffic signals was to conduct a very thorough traffic study the same as would be done to determine if warrants were satisfied for the installation of a traffic signal. The same guidelines were applied to the studies to see if the traffic signal was still warranted. Twelve-hour manual traffic counts were made at the selected intersections to be considered for possible removal. Flow diagrams were developed and a signal analysis was made to determine if the signal qualified for removal. If it was determined the signal should be removed and would not disrupt traffic, or would not cause unnecessary congestion or delay, and at no time would jeopardize the safety of the motorist or pedestrian using the intersection, the necessary legal work was prepared for the amendment to the traffic code. The signal was then put on flash for a period of not less than 30 days nor more than 60 days during which time the intersection was restudied to determine what, if any, effects it had on traffic. We wanted to be certain there was no unnecessary congestion or delay that developed and also to observe if the speed of vehicles approaching the intersection had not increased. When this study was completed and it was determined the signal was no longer needed, our Signal Division then removed the signal and all related equipment. It was vitally important to the program to have a very well planned publicity program. Working through the various neighborhood associations that would be effected, we went about the removal of 26 traffic

signals in a very systematic manner.

Pavement markings are used for the purpose of regulating, warning, or guiding traffic. Markings as defined for this purpose are classified in the following categories: 1) centerlines, 2) lane lines, 3) no passing zone markings, 4) pavement edge lines, 5) turn markings, 6) channelization lines, 7) stop lines, 8) crosswalk lines, and 9) parking space limits. There are numerous types of pavement marking materials such as paint, premixed beaded paint, hot paint, thermoplastic, cold plastic, just to name a few. All are a very important means of communicating with the motorist if used as defined in the manual. Thermoplastic, both hot and cold, are the more permanent type; however, naturally more expensive. One of the policies that we have adopted is to include the cost of thermoplastic pavement marking in all new resurfacing or roadway construction projects. About 23,000 ft of thermoplastic was applied in 1982, and almost 200 miles of city streets were painted with hot paint. About 480 crosswalks were painted at various school locations. There were also about 275 lane control arrows painted with reflective premixed beaded paint.

The city has several overhead railroad elevations that are supported by center abutments. Through the years, this has become a very hazardous situation in that on numerous occasions motorists have run into the immovable abutments resulting in serious injury or death. Impact attenuators were installed at each location. The abutment post was then protected by a cell cluster. The plastic tubes are filled with a calcium chloride solution to prevent freezing during the winter. Upon impact with the cell cluster by a vehicle the energy would be absorbed by the displacement of the water, thus reducing the seriousness of the accident.

The Police Traffic Division of the Fort Wayne Police Department has definitely played a vital role in the reduction of traffic accidents, particularly in the past 12 months. Our department receives a copy of every accident report that is investigated by the police department. Vital information from the report is stored in our traffic computer. Such information as location, the day of the week, hour of day, the type of accident, contributing circumstances, weather conditions, drive information, severity of the accident regarding injuries or deaths, etc. Each month we provide the police department with a complete computer printout of all the accidents that were investigated within that month's period. This information is then reviewed along with the list of the high frequency accident locations for that month. The oldest game in the book is then initiated. It is called "Selective Traffic Enforcement". By taking the high frequency accident locations, and determining the day of the week that most accidents occur, the hour of the day, and the contributing circumstance (what caused the accident) police officers are then assigned to observe that intersection on that day and hour. The apprehension of those persons observed violating the traffic law that would have resulted

in a traffic accident, has had a definite effect in the reduction of accidents at that location. I cannot emphasize enough, the effort and cooperation by the police traffic division to make this program a success. By observing intersections, or specific areas, and arresting persons for such violations as disregarding an automatic signal, disregarding a stop sign, excessive speeding, etc., a positive impact on the attitude of motorists is obvious. In the fall of 1982, a three month intensive selective enforcement program extending over the holidays was introduced. It was geared toward the apprehension of drunk drivers. The purpose of the program was to have police officers assigned to specific locations during the times that most traffic accidents were taking place where the contributing cause involved a drinking driver. As the officers observed and apprehended those persons each one was offered an opportunity for a breathalyzer test. Upon refusal their license was automatically suspended as required by state law. Each person who did take the test was photographed on closed circuit TV and a taping of that test was made to support other physical evidence presented to the court by the officers.

Several new radar units were purchased by the police department and put into use at pre-determined locations where excessive speeding was a contributing factor to traffic accidents. This is the first time that anyone has been interested in initiating selective enforcement program since early in 1973 when a federally funded program of selective enforcement was initiated for approximately four months.

The city constructed a safety village, to teach pedestrians and bicycle safety. Residential buildings, a school, commercial businesses, and industrial buildings were built on a reduced scale. The streets are one-third the normal size of an average city street. All traffic signals and signs are reduced in size accordingly. However, the same shapes, colors and word messages were identical to those out on the street. Children under the supervision of the Police Safety Education Bureau are brought to the facility, some were allowed to ride bicycles, some are pedestrians, and some drive miniature electric powered automobiles. They are taught to recognize the various signs and symbols and how to obey them. They are taught how to cross the street safely with a pedestrian traffic signal. The rules of the road and the application of certain traffic safety precautions are explained so as to provide maximum protection against traffic accidents.

An "Access Standards Manual" to control access was updated, and through the cooperation of the Allen County Highway Department, the City of New Haven, and the Indiana Department of Highways, it became a guide for all to follow.

A study of every school crossing in the city was initiated to determine what, if any, change was required to improve the protection of those persons going to and from the school. In many instances the

assigning of an adult crossing-guard was necessary. Street lighting became an important factor after studies were completed regarding high accident frequency locations involving nighttime accidents. A plan was initiated to install certain types of lights in certain areas. The street department devised a new system for sanding, salting, and snow removal. New equipment was purchased using a new type of rubberized plow blade so as to avoid damage to the street surface, pavement marking, and also manholes and catch basins.

In regards to parking improvements made throughout the city, but specifically in the central business district, several studies were made as traffic patterns change. It was determined that in areas presently marked "no parking" short-term parking could be installed. Fifteen minute parking meters were installed so as to allow parking from 8:00 A.M. to 6:00 P.M. in certain areas that would not disrupt traffic flow. This is possible in areas where perhaps two or three years ago four lanes of traffic were needed. These changes were brought about by the restructure of the central business district as far as commercial and retail businesses are concerned. These areas deserve careful study and consideration before initiating such a plan. We determined that certain areas could be designated as a "truck loading zone". With the cooperation of the motor carriers who made deliveries in the central business district and were not able to reach the stores where they are making deliveries from alleys, we designated at the beginning of a block or at the end of a block, "No Parking Truck Loading Zone from 7:00 A.M. to 11:00 A.M." This allowed truck deliveries to be made at a time when it would not be crucial to the movement of traffic or not inconvenience the shopper. After 11:00 A.M. the parking space then became available for those persons desiring to shop.

You can saturate your city with all types of traffic signs for parking control but unless you have an adequate enforcement program, the signs become ineffective. There are areas, of course, in which you can utilize an extra lane of traffic in the P.M. peak traffic hours between 3:00 P.M. and 6:00 P.M. These areas must be closely patrolled and enforced so as to be effective. In an effort to provide an easier and quicker method for motorists to get in and out of the moving traffic lanes while attempting to park on-street, we have adopted the tandem parking concept. You park two automobiles together and then have a "no parking" area of a minimum 10 ft. so as to allow an area for maneuvering when pulling-in or backing-in. This reduces the length of time the moving lane of traffic is blocked by those motorists attempting to park.

The city initiated several mini off-street parking lots and designed them so they would be attractive and provide off-street parking in areas where there was a demand. The city constructed phase one of the downtown parking garage that provides parking spaces for 465 vehicles.

The parking garage being connected to the Indiana & Michigan and People's Trust Bank Building, One Summit Square, by an overhead walkway that reduces pedestrian and vehicle conflict for those persons parking in the garage and working and doing business in the building. Phase two of the parking garage is now underway and will satisfy the parking needs of the convention center that will begin construction this spring.

In summary, let me say that anyone of these projects can be applied to any community regardless of size or population. By following basic proven engineering procedures much can be accomplished. We must remember that we are no longer operating in the ages where the old model T is driving down the street. We are now operating in an era where we owe our citizens the best possible and affordable transportation system available. It is time, gentlemen, to quit talking about it, quit making speeches, start planning, wade through all the paperwork that it takes, and all the studies and the analysis of studies involved, cut through all the red tape and actually apply what has been proven to be very complete and successful type of safety program with the most gratifying results.

The success of our efforts would not have been possible without the total cooperation of the mayor, director of department of transportation police traffic, the board of public safety, and the board of public works, who expressed confidence and believed in our programs.