

The Need for Coordination of Street Improvements and Traffic Operations

JOHN A. MASCARI, Assistant City Civil Engineer
Indianapolis

In the urban area there is definitely a need for the coordination of street improvements and traffic operations.

The street commissioner, city civil engineer, and city traffic engineer in the small cities and the large cities are all affected by street improvements. In some cases the city engineers and street commissioners are performing the duties of the traffic engineer. In the larger city their duties are separated, due to the establishment of three individual departments.

Let's review some of the recent street improvements completed in our cities and ask ourselves several questions. As city engineers, did we take into consideration in designing the street improvements how they fit into a thoroughfare plan, traffic volumes, traffic capacities, geometric design, the installation of traffic controls, and detours for the streets during construction?

As traffic engineers, have we taken into consideration the limited amount of monies available for street improvements? Is the geometric design an economical one, and does the design take into consideration facts other than those relative to the vehicle?

As street commissioners, were we consulted during the planning stages to find out what part we may have in street improvements? Is it our responsibility to establish and sign a detour? If it is, were we given sufficient notice, and did we sign the detour according to a standard?

If we can answer the above questions in the affirmative, I would say there is very little need for coordination. But let's be truthful, we can't say yes to all of them.

The traffic engineer can be of great assistance to the city engineer when it comes to traffic analysis and geometric design, for he has the knowledge and training. If your city does not have a traffic engineer, the planning section of the State Highway Department would be

more than glad to assist you in obtaining traffic data and doing a traffic analysis. The city engineer can be of great assistance to both the traffic engineer and street commissioner. He plays an important role when it comes to street improvement, for he must coordinate the improvements with traffic operations. He has the tools at his finger tip, but he has to consult with the agencies involved during the design stages, not after the contract is let or during construction.

Basically, the problems of coordination of street improvement and traffic operation can be minimized by proper cooperation during the planning and design stages.

During the planning stages there are many questions! For example, does the improvement fit into the thoroughfare plan or is it a political pressured project? We find the thoroughfare plan we have in Indianapolis has served as a Bible to the laymen who are elected to office and then constantly pressured for street improvements. If your city does not have a thoroughfare plan, I suggest you start immediately. If your staff is not capable of preparing one, there are a number of consulting firms that have traffic engineers on their staff that are capable of producing a thoroughfare plan. With this you will find the political pressures minimized.

In designing any street improvement, we must take into consideration the vehicle using it. Some of the critical errors I have seen in design are as follows:

1. *Ending the street improvement at curb lines without providing proper transition across the intersection.* This is also true when beginning the project—the other part of the street may be in next year's program, but traffic must continue to use the street. As engineers, we would be very foolish to never look at the other side of the river if we were designing a bridge. This is the same for traffic; it crosses the intersection, and if two lanes must squeeze into one lane there must be a transition which is long enough to allow the vehicles to weave into the proper lane. A good policy is to provide tapers of not less than twenty to one.

2. *Placing longitudinal and keyway joints at random spacing.* In this case the traffic engineer would perhaps place the paint lane lines on the plans first and then this would establish where the longitudinal joints should be placed. How many times have you seen where joints do not match lane lines? Why can't the two be coordinated?

3. *Negative super elevation on reverse curves or on street widening projects.* There are some negative thoughts and attitudes of city

engineers in designing super elevation on reverse curves in urban areas. Normally the radii of these curves are short because of property acquisition, but to keep the vehicles in their proper lanes super elevating the pavement is necessary. I know there are a number of problems in super elevating streets in urban areas because of abutting property or abutting street grades, but as city engineer we should be able to solve these problems that often arises.

When streets are widened it is very easy to invert the pavement; whereas, the existing gutter line remains and the new pavement has a negative super elevation. The next time you see a street widening project where they have inverted the gutter, give it a test run. You will get the idea right away that your vehicle is not designed to operate with perfection on this section of pavement. Normally this type of construction is brought about when the abutting walks and property are higher in grade than the top of the curb. It is true that if we drop to a new gutter line we may have excessive curb exposed and if we do have sufficient walk area to regrade, it will be necessary to remove and replace the walk and introduce steps at approach walks. But a solution must be found and the time to do it is during the design stage.

4. *Driveway replacement.* Many engineers have the feeling that it's a law that a driveway of the same width and shape must be replaced at the same location when a street is widened or reconstructed. Often a driveway leads to a small area which is used for parking and is within the right of way. When the street is widened, much of this area is used and the area remaining may not be large enough in size to accommodate parking vehicles without creating a serious traffic hazard. Why replace the driveway?

The number of driveways for service stations is another problem; why replace three or four drives when two will do the same job?

To solve many of the problems of replacing commercial driveways, a strong policy of design would be helpful. But I have not seen a strong policy in any city as of this date. The State Highway Department has one; but will it be satisfactory for our urban conditions? I think this should be a number one project for the traffic engineers because it is a major problem in designing street widening projects and would be a help to all of our cities in Indiana.

5. *Coordination in locating utilities and traffic signals.* This is a case where whoever gets to the corner first has the first choice. This is where the city engineer could restrict an area for the installation of traffic signals where they would best serve traffic. We must remember traffic signals are a part of the operational features of the street im-

provements and should come first in location. Another problem occurs when the city engineer forgets to place conduit for underground cable on the plans. The street is constructed and this forces the cable to be strung over-head. If the city had a master plan for the installation of traffic signals, conduit could be installed at the various locations during any construction. The conduit may not be used at present but its installation at this time would eliminate the necessity of cutting the pavement to place the conduit at some future date.

6. *Location of traffic signs during construction or after construction.* In many cases the traffic engineer or street commissioner after construction places traffic signs in the lawn area behind the sidewalk, because it is a messy job to tear up a new walk—or would you say we all take the easiest line of resistance. How effective these signs are in this location I don't know, but I doubt if the effectiveness is very great. One of the easiest ways to place these signs would be to place the U-Irons in the sidewalk area before the cement walks are poured. This would take an alert crew which would have to be notified well in advance, but it can be done.

This problem seems to belong to the agency charged with installing signs; however, we as city engineers can take this problem into consideration in our design. How many times have we as city engineers placed the sidewalk next to the curb in our design when there was sufficient right-of-way to place a lawn area between the curb and sidewalk? This area could be used for the installation of traffic signs beside other utilities, and would also serve as a safety barrier between the street and sidewalk. I know of the other considerations—such as, it's more economical to construct them next to the curb, or the abutting property owner will have longer front yards, but these still do not override the safety value of having a barrier between the traveled portion of the street and the sidewalk area.

7. *Detours.* This is one subject which we as city engineers must think of in our design. The engineer who does not think of this and feels that traffic can find its own detour is in for a lot of criticism; not only from the public but from other agencies involved. Let's point out some examples of where there was no thought given to other agencies:

During the summer of 1960 the State Highway Department, through a simple request from their maintenance department, started to resurface a highway in the city of Indianapolis. As usual, the work started at 7 a.m.; by 8 a.m. everybody was in a state of confusion except the contractor, who forgot to notify the agencies involved. It is my under-

standing that this has happened in other cities also. Why can't the State Highway Department give a few days' notice to the proper agencies?

I am not criticizing the State Highway Department because we have had the same condition in our city until one day several years ago when our mayor, enroute to work, followed a well-marked detour, only to find another contractor had just opened a sewer trench across the marked detour. The mayor turned around and took the next street to to his right only to find he had run into a dead-end street. With him there were several large trucks that were stranded. You can guess what happened; the police department was called at once to help untangle the traffic mess. As soon as the mayor arrived at his office, on the green carpet were the traffic engineer and the city engineer. From this meeting came a mandate from the mayor that all contractors give a five-day notice to all the agencies involved before any construction projects start.

Recently our department has established the policy that before any street improvement is started the contractor and agencies involved meet for a general discussion of all the problems involved. This has proved to be very satisfactory. The project is discussed and the responsibilities are assigned to the agencies involved.

Today the layman defines our responsibility as follows: the traffic engineer has to worry about the operations, the city engineer has to worry about design and construction, and the street commissioner has to worry about maintenance. This is true and it's all for the same street system. So with this in mind, there *must* be coordination of street improvement and traffic operations if that one system is to operate satisfactorily.