Policy and Plan Development Related to Corridor Traffic Management for Major Highway Reconstruction

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Major metropolitan highway reconstruction presents many challenges. The technical challenges, the scheduling challenges, the political challenges—all are enormous. The projects are typically expensive, so the financial challenges are equally large. Probably the greatest challenges, however, are those of systems analysis and customer service.

Nowhere is systems analysis more appropriate than when developing the policy and plan for a major metropolitan highway reconstruction project. Transportation planners learned a long time ago that, in urban areas, getting from point A to point B is a lot more complex than it appears. Typically, metropolitan areas have complicated, interconnected transportation systems. Also typically, major urban areas have complex, poorly connected decision-making systems. Reconstruction of major metropolitan highways has an enormous impact on the transportation system and the socioeconomic system of the area, as well as on the political system.

Highway engineers are only beginning to appreciate the concept of customer service. For years, if not decades, they saw themselves as highway builders. The simple solution was—build a new one, bigger and better! Now they are beginning to understand that, for many highways and in many metropolitan areas, the citizens don't want a new, bigger, better highway. Instead, they want better service from their old highways, their old and new political leaders, and particularly their highway and transportation agencies.

What do you do with an old, tired, and worn-out highway in a major metropolitan area? Many of these highways were built in the early days of the Interstate Program, often even before the program began. The design standards and construction methods in those days differed greatly from the modern, high-tech standards of today. Typically, these old highways carry huge volumes of traffic. In Pennsylvania, this means about 80,000 to 100,000 vehicles per day on four-lane highways. In short, states cannot afford to fix these highways, nor can they afford to leave them unrepaired.

Political leaders shudder when they think of reconstructing a major metropolitan highway. The political liability of possible failure and the many chances of failure get attention quickly. Reconstruction gives local politicians an opportunity to protect the interests of their city, borough, or village and maybe get a few extra benefits in

the process. For state legislators, reconstruction is an opportunity to protect and serve their constituents who live and do business in the corridor. For the governor, however, highway reconstruction is a huge, extremely visible project that will undergo public scrutiny in every possible medium.

For all politicians, whether state or local, the key is to turn a potential political liability into an opportunity to better serve constituents. To put it another way, it is a chance to turn a potential nightmare into a politician's dream. What is a politician's dream? A politician's dream would be to run unopposed. But we'll settle for getting reelected.

A key to getting reelected is to not only do good, but more important, to be perceived as doing good. The secret is to avoid disasters. Do a good job and create a public perception that you are doing a good job. Because of the great political liability associated with major metropolitan highway reconstruction, a good place to start when developing policy and plans is with the goal of turning a potential political nightmare into a politician's dream.

Project management is perhaps the most critical element in successfully reconstructing a major metropolitan highway. The most important organizational activities require the attention of top management. In the case of major metropolitan highways, it is critical to involve both the top elected officials and the top appointed officials. At the state level this means the governor and the secretary or commissioner of transportation; at the local level, mayors and county commissioners. The public perception that top elected and appointed officials are giving the project personal attention is paramount to successful policy and plan development.

When developing policy and plans, the management and decision-making team should include members with a broad range of expertise. Elected political officials are a key part of the team, as are top administrative officials of the various governments and public agencies. Finally, technical experts should be on the team—including transportation systems analysts, project design engineers, construction engineers, project scheduling and management experts, and public relations specialists. The management team for a major metropolitan highway reconstruction project might well follow the matrix model composed of individuals representing both the breadth and depth of political, administrative, and professional interests involved.

Even when the management team's expertise is both broad and deep, a clear line of responsibility must be retained for accountability. The chief administrative officer of the public agency that owns and operates the highway assumes primary accountability. A short chain of command between the day-to-day project manager and the chief administrative officer should be established and retained throughout the project. The single greatest project challenge is probably gaining broad participation in decision making, while retaining strict accountability for developing policy and plans and carrying out the project.

In Pittsburgh, during the reconstruction of the Parkway East, the district engineer retained day-to-day responsibility for policy and plan development. The media and the public both perceived the district engineer as a competent manager, as well as an effective engineer. In the Pittsburgh case, the district engineer personally coordinated both political and professional involvement in the project. Because of his prestige, he was able to gain broad political support and favorable media coverage. His professional expertise also allowed him to manage both the development and technical aspects of the project. Despite the complexity of the project, there was never any question about who was in charge and who had the authority to make decisions.

In Philadelphia, a bright young engineer was project manager. He was given broad

latitude in policy and plan development and making day-to-day decisions. He organized a 27-member task force of state and local officials to advise on policy and plan development. During the project he was in touch daily with the district engineer and in contact with the secretary of transportation at least weekly. In Philadelphia, too, no one questioned who was in charge. The young engineer's willingness to take responsibility and be held accountable is in no small way responsible for the success of this project thus far.

Successful policy and plan development requires both a great deal of imagination and the most careful attention to detail. Each major metropolitan corridor is unique, as is each area, and each group of people who live and work in the corridor. In many ways, each project must be started from scratch. Imaginative, innovative, and creative approaches to managing traffic and implementing actual reconstruction certainly pay off.

SPECIFIC ISSUES

Policy and plan development for corridor traffic management during major highway reconstruction raises certain specific issues. The issues came from the conference chairman, Michael Meyer. The responses came from the project manager on the Philadelphia project, Jeffrey Greene.

Issue 1: Importance of Having an Overall Plan for Dealing with Reconstruction Projects

It is vital to have an overall plan/strategy for a major reconstruction project that affects three fourths of a million users daily but we went further with the I-76 project—the administration made a strong, unwavering commitment to complete the project by the end of its time in office. Within that framework, the plan was to minimize disruption to the traveling public and do the job right—temporary fixes were not acceptable. Also, back in 1981, the department's finances had begun to rebound but were not, for many reasons, sufficient to finance such an effort. At the project level, while efforts to secure the funding were underway, planners devised a series of cash flow plans to provide for any eventuality.

It was only when the funding picture cleared that work on the traffic plan began in earnest. In short, *before preparation of construction plans began,* the department approved a comprehensive plan for the project that included

- A financial plan,
- An overall traffic management plan,
- A construction schedule, and
- A public information program.

With these four elements, the department could proceed in a unified, purposeful manner. In fact, except for Section 400, the plan held, the construction schedule was met, the budget remained intact, traffic flowed as expected, and the public perceived a job well done.

Had the department not done this level of planning, the schedule probably would not have been met; the development of traffic plan and public information plan would have been perceived as last minute add-ons and the department's efforts would not have been as credible.

The plan was central to the success of the I-76 project, and other agencies should undertake and complete this level of planning before construction plans are drawn—not after the construction plans are complete.

Issue 2: Political Implications of Doing a Good (or Bad) Job

In Massachusetts, many said the governor's reelection depended on successful completion of the Southeast Expressway reconstruction. In Pennsylvania, no one's reelection depended upon successful project completion, but the administration wanted to be remembered as the one courageous enough to tackle what some called an impossible project and determined enough to do it right. The public and public officials had to *perceive* that the department was devising and then carrying out a plan to minimize disruption.

Through a 27-member task force that guided project planning, local governments, elected officials, public agencies, and public interest groups were all involved in the development of the plan. Although some were involved more actively than others, all had the opportunity, through 14 formal task force meetings and over 50 public and private meetings requested by task force members and legislators, to influence all aspects of the traffic management plan as it was developed.

Further, the department made every effort to truly permit the task force to make project planning decisions. For example, the task force

- Reviewed the results of the origin-destination survey after approving the questions to be asked;
- Reviewed the diverted peak hour traffic volumes and the potential impacts; then

—Suggested, then approved, the off-system improvements based on an analysis of benefit;

—Determined the construction section limits after reviewing construction implications, such as what could be accomplished in *one construction season;*

—Determined that the task force wanted to actively manage the traffic demand on the expressway by closing ramps; and

—After each task force meeting, participated in a news conference (or other media contact) to announce the decisions made.

In short, every effort was made to make the final plan the task force's plan, even though the department kept ultimate responsibility for its success or failure.

Issue 3: Need to Look at the Entire System to Identify Potential Problems

All agencies that were responsible for operating transportation facilities were on the task force, formally or otherwise. A map was made showing potential construction conflicts, and each agency, including the department, worked to either accelerate, postpone, or modify the construction. This was not a problem, but had it not been done, many key diversion routes would have had traffic restrictions on them.

The regional transit operator in the Philadelphia area, through a subsidy from project funds, added additional services. Under the subsidy agreement, additional patronage diverted by the project reduced the subsidy paid to the transit operator, who was allowed to keep fare box revenue. The service added due to the project operated at lower subsidy levels than estimated from the results of the origin-destination survey. In fact, one line required no subsidy at all and operated at a profit.

Issue 4: Determination of Project Design Criteria to Meet Future Construction and Maintenance Needs

No one wanted to have to go through this effort again on I-76, and a plan was made to minimize future maintenance and eliminate the need for later major reconstruction. Key elements of the plan included

- A thick asphalt overlay on a fully repaired concrete base,
- Saw cutting and sealing the overlay to eliminate reflective cracking,
- Concrete "jersey" barriers rather than guiderail,
- A concrete median barrier high enough to be a glare screen, and
- Epoxy reinforcing steel in all bridge decks and concrete exposed to corrosive salt.

The construction materials used should make future reconstruction unnecessary. Routine pavement maintenance includes milling the old asphalt surface course and then overlaying with new or recycled material. This would be expected at 10-year intervals.

There is no maintenance-free highway, but by managing project design and construction materials, planned maintenance can be minimized, as can the associated traffic disruption. In this case, the milling and overlay operation for next resurfacing can be done at night without affecting daytime traffic.

Issue 5: Level of Service Acceptable for Highway Users During Reconstruction Projects

The task force discussed no specific level of service as a goal either on the expressway or on the diversion routes.

What members discussed instead was expected travel delays on the expressway over preconstruction travel times and the location of bottlenecks on the diversion routes created or made worse by diverted traffic. The key issues were travel time increases and the greater difficulty side-street traffic would face when entering diversion routes. Level of service really has no meaning to the public. Consequently, in the project planning, bottlenecks received attention for TSM type improvements and arteries for coordinated signal system installation.

Issue 6: Importance of a Corridor Management Team or Some Institutional Framework to Guide the Project

The I-76 corridor management team was the Traffic Monitoring Program. The traffic planning consultant stayed to work with department traffic engineers to solve problems as they arose. Program officials undertook an extensive program of traffic counts, field observations, and travel time studies. Signal timing plans were optimized, and the performance of temporary traffic signals was evaluated. Decisions to resolve traffic problems were made virtually on the spot.

The first two construction seasons, the biggest, came off without serious traffic disruptions. In fact, they went so smoothly that the media covered a nonevent the first year, and the second year reported that the traffic diversions and delays occurred as predicted. In many cases, as problems arose and were reported by the media, engineers were on the scene solving them. The Traffic Monitoring Program was designed to be one step ahead of the media, so that when the media reported a bottleneck, they also reported that it was being corrected.

On the expressway, the plan was to make the unavoidable delays predictable—the same each day and of reasonable length—less than 20 minutes at any given location.

Issue 7: Need for Funding Mitigating Measures or Improvements on Alternate Routes

Had funding for improvements to alternate routes, the transit system, or other programs such as ride sharing not been available, the project would probably not

have been as successful. In fact, the government would have looked unresponsive to a real and documented need.

The I-76 project proved the need for off-expressway strategies. Bottlenecks were eliminated, improving traffic flow over existing conditions even with increased traffic. Overall flow on major parallel arteries was improved with the new coordinated signal systems. These were visible and, in most cases, permanent improvements. The government appeared to be in front of the issue in the eyes of the public and not reacting to public pressure after the fact.

Issue 8: Trade-off Between Scheduling Project Construction to Minimize Disruption or Speeding Up the Construction Process

This is, in a way, a false issue. Every project is different—its setting in the transportation picture, the type of traffic it carries, and the work to be done. A better issue is the maintenance of the movement of people, goods, and services to the greatest extent possible and fitting this movement into a construction plan that is as rapid as possible. The interests are not competing ones that can or should be the object of a trade-off analysis. If serious disruptions are unavoidable, then incentive/disincentive contracts are indicated. The construction industry can respond to a challenge to speed work. They also can respond with surprising ingenuity to work around traffic. However, the plan must be well thought out from the point of view of design. The biggest challenge is changing the institutional aspects of normal highway construction to meet the special needs of a potentially disruptive project. Once a project is no longer business as usual, the industry will respond successfully.

Once traffic restrictions are in place and construction is underway, the public expects to see daily progress. If all they see is one crew doing one operation, the public's confidence will erode. Every portion of the work zone should have work going on. To the extent possible, the construction schedule should demand this. Only then is the price the public is paying in travel delay tolerable.

GENERAL COMMENTS

To summarize, these are the general subtopics for policy and plan development generated by the conference steering committee. These topics were selected to stimulate discussion.

There is no question of the importance of an overall plan or strategy for dealing with the project. Each city, each transportation system, each corridor is unique. Opportunities are limitless for creative solutions and innovative approaches. Plan development is most likely to succeed when there is broad participation in the plan development process. In the case of corridor traffic management during major highway reconstruction, it is impossible to plan too much.

The political implications for major highway reconstruction are enormous. On the negative side are the potential liabilities of possible disasters. On the positive side are the opportunities to serve citizens in a very special way. Major highway reconstruction is most certainly going to generate a lot of publicity. Be prepared to give the credit to politicians when things go right and to take the responsibility when things go wrong. Although the potential political pitfalls are great, so are the political benefits of being part of something as important as a major highway reconstruction, and particularly one that goes reasonably well.

Having a corridor management team is a definite advantage. People affected by the project want to be involved in decisions that touch their lives. The corridor

management team is an excellent mechanism for informing various interest groups of what to expect. The corridor management team is a way to get others involved in the project and share responsibility for what happens. In the long run, managing the corridor management team may well be even more difficult than managing the project itself. But the advantages are certainly worth every effort.

The need to look at the transportation system as a whole is critical in major highway reconstruction. First of all, transportation systems always seem to have more capacity than they appear to have. We need to find this capacity and use it. Every conceivable alternative route and mode should be considered. Coordination of possible construction work on alternative routes is another critical element in managing traffic during construction. Clearly, a good understanding of systems analysis and its application to both urban transportation and traffic operations is valuable in major highway reconstruction.

Non-highway or rather, off-highway, mitigation measures should be considered. Experience has shown that commuter rail and rail transit alternatives are more effective when they already are part of the corridor system. Also on-highway transit and paratransit are probably the most effective alternatives as far as transit goes. Most travelers who are diverted from the primary facility somehow find an alternative route using their regular mode of travel. Even though most people still use their cars, every possible alternative should be identified and promoted.

In many ways, level-of-service is the most critical issue. Also, in many ways, it's a non issue. Most people interested in the project don't really understand the level-of-service concept. People do know how long they have to wait to get through certain bottlenecks. The key measure of performance for the public and elected officials is minimal delay at bottlenecks. It seems that they place more importance on the level of effort to minimize delays. The public expects delays. They will accepts delays given sufficient information on where they are likely to be, when they will happen, and how long they will last.

Project design criteria now reflect great sensitivity to the next reconstruction cycle. For example, shoulders are redesigned to serve as extra lanes during reconstruction, even though under normal circumstances they would be reserved for reasons of safety and emergency storage. Pavements, in particular, are designed to minimize future reconstruction requirements, as well as to minimize disruption when reconstruction is required. In general, project planners are tending to use materials and designs that will require a minimum of maintenance and last indefinitely if not infinitely. Apparently, many public, political, and psychological costs are associated with major highway reconstruction that were not accounted for in the original cost-benefit analysis when these projects were first designed and constructed. These should be considered in reconstruction.

The public must feel as if project sponsors are doing absolutely everything possible to shorten the inconvenience. Of course, the ultimate solution is to close the facility to traffic during reconstruction. Most lack the courage to do this, even though it has been suggested. Construction scheduling is even more important in the snow belt states where the season is short and winter driving is hazardous in itself. In general, it is best to keep the facility partially open to traffic during reconstruction and, as far as possible, completely open to traffic during the winter. Within these constraints, do everything possible to compress the schedule.

Public information is by far the most critical ingredient in a successful major reconstruction project. The public information aspects of major reconstruction projects are too critical to assign to an engineer, no matter how skilled. A trained public relations and communications expert should be assigned to the project. This expert

will advise on how to educate the public about possible problems, inform them when things are going to happen, advise them on alternatives, and explain things that don't go quite right. In the final analysis, of all the experts, the public relations and communications expert will have been the most valuable.