

CHAPTER 5

IN-HOUSE PAVING AND CONTRACTOR PAVING PROGRAMS

5.1 CONTRAST BETWEEN IN-HOUSE PAVING AND CONTRACTOR SERVICES

MPW has the flexibility to choose between in-house forces and outside contractors when implementing a pavement restoration project. Such flexibility is key to the timely and efficient programming of projects in the pavement management system. Choosing between in-house and contractual services requires an understanding of the unique characteristics of each choice.

Specific work skills such as paving operations must be utilized regularly or they will be lost. Paving contractors pave continuously; their crews and equipment are skilled and well maintained. Public Works employees often perform many duties, only one of which is paving. Employees with several years experience but without recent experience are better than employees with no experience at all, but such crews will rarely be efficient when pressed into service on paving projects. The equipment is likely to need repairs, crews will need more time to mobilize, and safety issues may be more likely to arise due to lack of practice of those paving skills. Newer employees will have few opportunities to work with veteran employees.

When choosing between in-house and outside crew assignments, managers should consider the amount of interaction needed with the public, the potential for change orders, and the discretionary judgment likely needed in the field. Typically, in-house crews interact more effectively with the public than do contractual crews. Change orders can be handled more efficiently with in-house crews, and policy decisions can be made and communicated easier with in-house crews.

By contrast, projects that require longer hours during the day or work on weekends should typically be assigned to outside contractors. Likewise, projects requiring longer commitment of personnel and more coordination among crews may be accomplished more efficiently by outside crews. Finally, a large number of similar jobs may be completed faster by contract.

In general, contractor crews are best used when a high degree of labor coordination or time commitment is involved. In-house crews are best used for complex projects involving citizen interaction, potential change orders, and policy decisions in the field. Wise choices among in-house and contractor crews will stretch pavement dollars further.

If a public works department has the appropriate equipment and skilled employees, that department should be undertaking significant paving projects each year. The annual volume of work ideally should approach the department's historic annual capacity of work. Younger employees should have mentors within the work force who will pass along the skills necessary to accomplish significant paving projects.

5.2 IN-HOUSE PAVING

The availability of an in-house paving crew is essential to any public works department that maintains public roads. In-house crews can respond on an emergency basis and significantly reduce downtime of critical roadways. In-house crews also have the flexibility to handle smaller projects, stretching resources by utilizing public staff and equipment that otherwise would not be engaged.

MPW has established paving crews that have engaged in complex paving operations for years. MPW crews have years of project experience, available and well-maintained equipment, and sufficient tools, signs, and transportation to accomplish paving tasks with no outside resources. HMAC is obtained from the batch plant using city trucks rather than relying on delivery by an outside contractor. A summary of MPW paving capabilities is located in Appendix A.

In-house crews provide tangible value that cannot be duplicated by outsourcing, and does not appear in a direct comparison of costs on a per-unit basis. When assessing the role of public works departments in paving, these additional benefits need to be considered. The ability of public works crews to respond to these circumstances, though, is directly related to those crews having a significant portion of ongoing paving projects. Keeping skills fresh and passing those skills on to new employees is vital to maintaining paving capacity in the department.

5.2.1 Emergency and Safety Projects

Most paving needs develop slowly, providing time for repair or pavement preservation methods to be programmed, often years in advance. However, some repair needs are immediate and constitute an emergency condition or a significant safety need that cannot be delayed, e.g., a sinkhole or burst water main.

In theory, emergency repairs could be outsourced, using a standard hourly rate for repair. In practice, outsourcing for such work presents significant problems in terms of response time, cost, and oversight of the work. Frequent use of outsourcing for emergency and safety repairs can be expensive, even when contractors are responsive and attentive to needs.

While small cities often have no choice but to use outsourced paving crews, larger cities have too many emergency conditions to make outsourcing feasible in all circumstances. The city may have to pay a considerable penalty to get the crew to the city project. If the city demands priority at the time of bidding without penalty, contractors may bid a high unit price in order to cover unknown conditions. Either way, the city will likely pay a premium for prompt service in emergency conditions.

In-house paving crews can be diverted from another task immediately, committing as much staff and equipment as may be necessary without having to negotiate with an outside contractor. A paving crew already in the field making routine repairs on other sites can often make an emergency repair in the course of the day's work with limited disruption. A safety project can be scheduled within days, sometimes hours, of the initial repair decision being made.

5.2.2 Budget Constraints

An in-house paving crew also gives an agency an opportunity to respond to critical projects during times of budget restrictions. Typically, members of a paving crew perform other tasks during the year, including right-of-way mowing and maintenance, storm drain repairs, snow removal, trash pickup along roadways, and sign placement. Such crew members can be shifted from those tasks to a paving project; in such a case, the only direct cost would be the materials and any equipment rental. Obviously, excessive diversion from other work will simply cause a backlog in those work areas, but the availability of in-house crews for paving can make a significant difference in project completion during times of budget restrictions.

The flexibility to shift resources during constrained budget periods is very helpful to public works management. When municipal budgets are restricted, funding for outsourced

capital work, including paving projects, is frequently cut or placed on hold. In contrast, the layoff of public employees is among the least used methods of budget reduction. If public works employees have multiple skills, including paving, and the appropriate equipment is available, many projects can still be completed in-house. Public works management then has the simpler task of obtaining material to get the public employees and public equipment engaged in construction work.

By contrast, a public works department with few or no employees with paving skills and aging, unreliable equipment cannot provide a significant response to paving needs during a budget crisis. Fewer projects get completed, since such work must be accomplished using contractual services. The less skilled employees are then assigned low-profile tasks, e.g., right-of-way maintenance. While such work is always needed, the department is not able to respond to the more critical paving needs of the community. Over time, the public perception of the department's value to the community will be diminished.

5.2.3 Time Constraints

Some projects that do not necessarily qualify as emergency or essential safety projects may nonetheless have a tight time schedule that does not permit the normal contractual bidding schedule to be met. An accelerated utility project, work related to a major but unanticipated event, or a deadline for a grant application all may create projects that cannot wait for the next bidding schedule but would not appropriately be considered emergencies or urgent safety needs.

Such projects are well suited for public works departments to handle in-house. These projects are often complex and require on-going policy decisions. Engineering design can be accomplished quickly and given directly to public works crews, saving valuable time. Assuming timely completion has a value, the use of in-house paving crews has considerable potential to save money in such circumstances.

5.2.4 Citizen Interaction

Most paving projects, especially those involving standard overlays, are accomplished with limited public involvement. Provided notification of on-street parking restrictions is made in advance and traffic control follows recognized standards, the public relations element of most paving projects can be effectively handled by the private sector.

However, some paving projects do involve a heightened level of public involvement. Typically, such projects involve cases where on-street parking is critical (for access to small businesses or high density residential areas), locations where driveway abutments require extensive adjustments, streets with critical slopes for drainage, sites at which particular pavement markings or traffic calming devices have been installed, or communities which have experienced poorly implemented projects in the past. In cases where the neighborhood sensitivity to the paving project is high, the required attention to details outside the normal scope of paving and interaction with the public is more than routinely encountered.

In such cases, the ability of the paving crew to make effective decisions consistent with department policy is very important. A paving crew not familiar with specific neighborhood needs can make mistakes that can harm the department's image as well as incur additional expense. Giving 24-hour notice for on-street parking may not be sufficient if the drivers are out of town (college students during spring break) or rarely drive (elderly residents). Restricting parking from both sides of a neighborhood business area without off-street parking on the same

day may give shoppers no parking opportunities and harm the businesses for the entire day. A paving crew that is not aware of a local drainage problem may unintentionally alter the storm water flow and create or aggravate a drainage problem. Special attention may be needed in areas with bikeways, pedestrian crossings, traffic calming devices, or other devices and markings in the pavement.

In all these cases, field decisions consistent with department policy must be made quickly. When a senior manager needs to be consulted for a policy decision, a department employee will likely be able to reach the right person faster than someone not involved in local government. If field changes or additional work are needed, the public works crew can complete the work without having to negotiate a change order. If discussions involve a citizen, the correct information is more likely to be conveyed from within the department rather than through an outside party.

Finally, the value of citizens seeing MPW staff, vehicles, and equipment at work on their street cannot be dismissed. While citizens may be appreciative in seeing a private contractor maintaining a street, those citizens may not know who is paying for the work. Giving citizens the opportunity to see their own local government employees providing services effectively has long-term public relations value for the department.

5.3 CONTRACTOR PAVING

Public agencies contract for those services that are not efficient or practical to be provided in-house or which do not fit within the agency's mission. MPW is fortunate to have multiple contractors that bid on each paving project, which results in competitive paving project costs. Maintaining qualified staff and equipment to provide all of the city's paving needs would not be economical, since insufficient work would be available for the crews during portions of the year.

Municipalities in northern climates can support a larger public works staff than southern municipalities. During construction season, more people can be hired and assigned to paving crews. During winter months, the extra personnel are allocated to snow removal and winter maintenance operations. In Nashville's climate, winter work opportunities are limited, making it uneconomical to hire large numbers of people for construction season work.

Contractual operations can take two forms, a general contractor or a construction manager. A general contractor obtains quotations from several specialized subcontractors and then submits a single bid; the general contractor signs the contract, provides all bonds and insurance, and pays the subcontractors after receiving payment from MPW. A construction manager is an agent for the governmental department who administers a series of contracts with a group of specialized contractors working under the coordination of the construction manager. (The construction manager may be a government employee, an independent manager, or one of the contractors bidding on the work).

Most bids handled by MPW involve a single general contractor rather than a group of individual contractors working under a construction manager's direction. Typically, contractual operations by general contractors provide five broad advantages over in-house operations:

5.3.1 Sole Responsibility

Having a general contractor handling a pavement project provides a single point of contact for MPW. The general contractor for paving operations typically owns and operates the

hot-mix plant and owns or leases necessary equipment. The general contractor may have subcontractors for functions such as traffic control, truck transport, concrete work, utility work, paving markings, testing, and traffic loop maintenance. Because the general contractor has sole responsibility for the project, MPW officials have no need to contact subcontractors directly. Additionally, the general contractor takes responsibility for problems and addresses the issue of specific responsibility within the construction team without MPW having to be involved.

The cost savings of a general contractor are significant, since considerable MPW staff time could be involved in trying to determine which of several subcontractors was responsible for an error or delay. The general contractor builds the cost of this part of project management into the contract price, so MPW ultimately pays for the service. However, MPW personnel can then direct their time and attention to other areas rather than being involved with the details of the project operation.

Should the general contractor fail to pay a subcontractor or supplier, declare bankruptcy, or simply abandon the job, the project's payment bond is available to resolve any claims without MPW being directly liable. Should a warranty item arise which the contractor is not able or willing to resolve, the performance bond is available for use in resolving MPW's claim. An outside bonding company normally issues both the payment bond and performance bond for 100 percent of the contract value. The cost of the bonds is paid by the contractor as a condition of the contract and is built into the contract price as part of the original bid.

5.3.2 Productivity and Flexibility

Private contractors typically have fewer labor regulations than public agencies. A government agency must operate under rules of civil service protection, meaning the ability to hire and fire employees is restricted and cumbersome. A private contractor can lay off employees when insufficient work is available or when the construction season ends, then rehire the desired available employees when work is available, actions that public agencies cannot consider. The retirement programs of private employers, if provided, are typically transportable 401k individual accounts, not the defined pension programs of the public sector that anticipate and reward many years of uninterrupted service with a single public agency.

Private paving contractors provide services for state, municipal, and private clients and normally have high tonnage jobs that make the use of large-scale, efficient equipment economically feasible. By contrast, a municipal public works department could not justify the cost of such equipment, even though the equipment makes a paving crew more productive.

5.3.3 Extended Work Hours

As a consequence of having a different set of hiring rules, private employees can demand longer work hours during the construction season, since employees know they may be laid off in winter. That flexibility means that private contractors can operate late in the day during summer months and on weekends. When paving locations require night operations, private contractors can provide that service as well, keeping their batch plants operating as late as needed. A public works department could request but could not demand that a batch plant stay open for the convenience of MPW crews. This flexibility increases productivity on a daily and weekly basis. Contractors can pay overtime to production workers and managers as needed to keep sufficient workers on the job.

Public works employees work nights and weekends, too, but such work is normally on an emergency basis. Government agencies rarely have excess funds to pay production workers the required overtime, and government managers on fixed salaries typically must take either compensation time or simply work the hours as part of a set annual salary. Given the number of emergency circumstances that arise in the course of a year, government agencies are usually reluctant to involve public employees in extensive night and weekend work for routine projects.

5.3.4 Large Project Responsiveness

Contractors specialize in labor management and have the flexibility to optimize work production through temporary hiring, overtime work, and subcontracts with other contractors. The result of this management is fast turnaround time, often faster than the public sector, constrained by rules and policy, can provide. If a large project needs to be completed as quickly as possible, the private contractor can typically respond more quickly and efficiently than the public sector. Additionally, the work deferred by the private contractor will usually have less public consequence than that deferred by the public sector.

A quicker response time may come at a higher cost, however. Hiring and training temporary or seasonal workers is expensive. Contracts with other contractors involve overhead that will be passed on to the public sector. Increased management effort on the part of the contractor and the assumption of more cost and liability by using temporary workers, working overtime, or retaining subcontractors will result in a premium price for the work.

5.3.5 Streamlined Procurement Practices

Public agencies must follow strict procurement practices, including public biddings, detailed specifications, contract documents, and utilization of small and disadvantaged businesses. The result is an extended, complicated purchasing process that is rigid and time-consuming.

Private contractors are not required to follow the strict and complex procurement practices used by government entities. They can take advantage of bulk or repeated purchases from a long-time business associate and demand priority service as a result. They need to meet the specifications of the public contract, but their own purchasing can be done with less detailed contractual language. As a result, the private purchasing process is less time-consuming and more responsive.

5.4 CONTRACTOR PAVING CAPABILITIES

Just as the capacity and skill level of MPW is vital in determining the role of the department in providing paving and milling services, the ability of private contractors to provide both routine and specialized pavement preservation services is equally important. MPW is fortunate to have several contractors available to provide most pavement preservation service. Services available include:

- Milling and overlay
- New construction
- Reconstruction
- Surface seals and rejuvenators

- Crack sealing
- Pothole patching
- Spot removal and patching
- Shoulder maintenance
- Emergency road maintenance.

At least one contractor has indicated interest in bidding on each of the above categories on a group project basis. Currently, none of the local contractors have equipment for cold in-place recycling, but would likely acquire such capability if quantities were extensive and commitment to such work was on-going.

The current contractors have at least one asphalt plant in Davidson County and more in surrounding counties. Stockpiles of aggregates are maintained, and contractors can develop a range of specific mixes. The contractors prefer using their own batch plants and are not interested in having a designated material source. Given the narrow differences in unit costs by plant, little savings would appear to be achieved by using a single source. The contractors are not interested in laying asphalt produced by government agencies or other contractors.

5.5 VALIDITY OF COST COMPARISONS BETWEEN IN-HOUSE AND CONTRACTOR PAVING

A common policy question arises when comparing in-house versus contractual paving. A natural curiosity exists with respect to comparative costs. Does a private contractor pave streets at a lower cost than a public works department? If so, should private contractors always be used?

In practice, the question is not that simple. First, the full costs of paving must be determined. Second, costs savings that are passed to the public agency and which are absorbed in internal operations of the public or private sector must be identified. Finally, the non-monetary costs, or costs that impact parties beyond the public agency and the contractor, must be quantified.

For the public agency, the true cost of paving is more than the material costs of asphalt concrete, tack coat, and stone. The cost of purchasing and maintaining equipment must be identified, even though the public sector does not track depreciation costs. An annualized cost that includes salvage value is typically used in place of depreciation. The cost of transporting material from a batch plant or quarry to a job site must be included if performed by the public sector, which includes both labor and equipment. The incremental cost of providing insurance for equipment and personnel involved in paving operations should be included. Finally, the lost opportunity cost of crews not performing other work must be evaluated when assigning public crews to paving operations.

The private contractor has a similar set of costs for materials and transport, including purchase or rental of equipment. However, the private contractor is able to take advantage of certain tax laws with respect to depreciation and other costs. Having flexibility in renting or leasing equipment means that the contractor is less likely to purchase equipment in one initial lump sum payment as do public agencies. Because the equipment is often on a lease or other contract, the private contractor has an incentive to keep such equipment productive and to trade it

before high maintenance or downtime costs occur. Public agencies have to compete for capital monies within tight multi-department budgets and often have to keep equipment well beyond optimum trade times.

Performing work at a lower cost is only meaningful if the savings can be realized by the public agency. A contractor who achieves savings on a job does not normally lower the price via a change order unless the savings has been expressly identified as part of a negotiation process. A public agency that completes a job ahead of schedule benefits only if the crew can proceed to another assignment, and the realization of the savings may never be quantified and reported.

Care must be taken to ensure the scope of projects is comparable. A public works department that has to complete many small projects scattered throughout an urban area cannot be expected to meet the same unit price as a contractor with a few large projects in one area of the county. Likewise, a private contractor who must complete work in a short time period will incur higher cost than a public agency or another contractor who is given much longer to complete the same scope of work.