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Abstract This report represents the first phase of an effort in support of the Virginia Department of Transportation's recently created Antitrust Monitoring and Detection Unit within the Construction Division. It provides background on the economic and legal aspects of anticompetitive market behavior and the recent experience with bid rigging in the construction industry. The purpose of the work is to provide a framework for a second phase, which will be an empirical study of the highway construction industry in Virginia. The second-phase work will also support VDOT in its evaluation of collusion detection models, the ultimate goal of which is to establish a comprehensive antitrust monitoring and detection system for use by the Construction Division of VDOT. This report has four major sections. The first deals with economic factors affecting competitive behavior. The second describes major aspects of antitrust law as it affects the highway construction industry. The third section is a summary of recent experience with bid rigging, and the final section presents proposals for hindering collusive behavior and detecting antitrust violations.				

LEGAL AND ECONOMIC ASPECTS OF COMPETITIVE MARKET BEHAVIOR

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INTRODUCTION

National experience in the early 1980s showed that collusive activity among bidders on highway projects can present serious barriers to an effective construction program.

The large number of highway projects Virginia has planned for the next decade will pressure the construction industry to expand rapidly. It is, therefore, particularly important that the Virginia Department of Transportation (VDOT) develop and implement effective methods to ensure competitive bidding. As part of such an effort, VDOT established a small unit within the construction division dedicated solely to bid monitoring and collusion detection. In addition, the Virginia Transportation Research Council (VTRC) undertook a program of applied research in support of that effort.

PURPOSE AND SCOPE

This report represents the first phase of that supportive effort. It provides background on the economic and legal aspects of anticompetitive market behavior and the recent experience with bid rigging in the construction industry. The purpose of the work is to provide a framework for a second phase, which will be an empirical study of the highway construction industry in Virginia. The second-phase work will also support VDOT in its evaluation of collusion detection models, the ultimate goal of which is to establish a comprehensive antitrust monitoring and detection system for use by the construction division of VDOT.

This report has four major sections. The first deals with economic factors affecting competitive behavior. The second describes major aspects of antitrust law as it affects the highway construction industry.

The third section is a summary of recent experience with bid rigging, and the final section presents proposals for hindering collusive behavior and detecting antitrust violations.

ECONOMIC FACTORS AFFECTING COMPETITIVE MARKET BEHAVIOR

The Marketplace

When one speaks of defining a market, one is delineating all parameters that compose the market: who the actors are, what products are sold, the geographic limits of competition, customers, prices, etc. Defining the market is often critical in antitrust cases as the definition tells the court who is and is not in competition.

"Competition" is also an economic term and refers to a specific type of market conduct. In the strictest sense, a market is deemed competitive when it exhibits the following: (1) many firms, (2) a homogeneous product, (3) free entry to and exit from the market, (4) perfect knowledge by participants in the market, and (5) independence in the decisions firms make.

When the conditions for a purely competitive market are disrupted, different market types arise, most notably monopolies and oligopolies (1). In the case of monopoly, consumers lose the choices presented by a large number of brands of the commodity in question. Instead, the market has one producer of the good, with barriers to entry that foreclose other competitors from entering the market. Prices tend to be high and production levels low.

In an oligopoly, a similar situation arises, as there are only a few sellers. These sellers recognize that they produce substitutable goods and that they, as well as their rivals, can influence the price of the goods (1). An oligopolist recognizes this "mutual interdependence" among firms and that maximizing profit depends not only on his firm's behavior but on other firms' behavior as well.

In both monopolies and oligopolies, the sellers recognize that their individual output decisions affect price. In the language of economists, they each have some degree of market power that depends not on absolute firm size but rather on the size of a firm relative to the market (1).

The rationale in the United States for the preference for competition over other forms of market structure (i.e., monopoly and oligopoly) has both a political and an economic basis. Competition is viewed as superior in these contexts because it allows supply and demand forces to solve economic problems rather than allowing decisions to be made by the few who hold power. It is also generally held that "producers and sellers put forth their best efforts [that is, they choose the least costly methods of production] when threatened by rivals" (2).

Market Failure

Market structure situations such as those created by monopolies and oligopolies frequently lead to what is termed "market failure." The market fails in that productive resources are not used efficiently (that is, labor, equipment, and other resources are not combined in a fashion that yields minimum costs); however, market failure need not always be the result of market structure alone. Often, it is the product of actions on the part of market participants in conjunction with market structure.

Generally speaking, the type of market failure addressed in this report falls in the category of cartelization. Cartelization is a form of market failure typically resulting from the actions of sellers. It is "an explicit arrangement among, or on behalf of, enterprises in the same line of business that is designed to limit competition among them" (3). This concept includes conspiracy, price fixing (bid rigging), and explicit collusion.

Collusion

"Collusion" is a term used to define the actions of firms that coordinate their pricing or production policies in an attempt to increase their profits (4). It is usually a "formal or explicit agreement among competitors" (5) as a means to earn greater-than-competitive returns, but it can take many forms. In some cases, a large group of competitors selling a product that differs among transactions (e.g., construction) may have regularly scheduled, formal meetings with or without the aid of a trade association. In other instances a small group of competitors in a market with a simple product may communicate under less formal circumstances. Sellers in markets with repetitive purchases (such as materials suppliers) may agree upon a single list price for an item or draw up a price list for referral with or without customer allocation schemes. Sellers in markets characterized by nonrepetitive purchases may even choose to allocate jobs or territories through complementary bidding (5) or may rotate winning bids and shares of the market (1).

All these schemes and countless others have one thing in common: Regardless of their design, any form of agreement (open or secret) designed to fix prices or restrict output is illegal. Yet despite its illegality, for many businessmen, firms, and even industries, collusion is a way of life--an accepted method of doing business (6).

Why Collude?

The question "why collude?" has a very simple, and perhaps even obvious, answer: The purpose of virtually all collusive arrangements is to attain joint maximization of profits for those firms participating in the conspiracy. Clearly, if the firms can act as a unit, they will effectively operate as a monopoly, enabling them to price and produce as a monopolist. While firms being prosecuted for collusion often suggest they collude to prevent ruinous competition, joint profit maximization has always been the objective.

Given that collusion is illegal, one might wonder what market conditions lead firms to participate in conspiracies. Reasonably enough, various forms of cartels almost always occur when collusion is both feasible and a necessary condition for attaining joint maximization of profits (2): if there are market conditions that render collusion infeasible, it will not occur (at least not successfully); furthermore, if collusion is not necessary in order to reach joint profit maximization for those firms comprising the market, it will not occur.

The necessity of and feasibility for collusion are determined by the structure of the market. Therefore, when one suspects collusion, the market structure should be examined as a check on the validity of the suspicion. Necessity and feasibility vary in a fashion consistent with the structure of the market. Two examples can be given to demonstrate this relationship. The first example is a market with hundreds of small firms selling a standardized product, such as wheat. A cartel is necessary for firms to achieve joint maximization of profits (or high profits) because the large number of sellers forces prices and costs to be very close, but collusion is infeasible because of market structure: recognized interdependence is too remote, the incentive to cut prices is too great, private enforcement of such a hypothetically large conspiracy is too costly, and the likelihood of detection is too great. A second example is where the market has only two sellers of a simple, standardized product (perhaps asphalt). A cartel is quite feasible in this instance, but collusion is entirely unnecessary in order to achieve joint maximization of profits. With only two firms in the market, recognized interdependence is unavoidable; there are relatively no incentives to cut prices; the opportunity for price leadership is clear, so that conscious parallelism can yield a monopoly outcome; and, because explicit collusion is illegal, tacit collusion will most probably occur instead (2).

Thus collusion is most likely to be found where it is not only feasible but also necessary in order to maximize profits. If the market's structural conditions are unfavorable, necessity and impossibility will rule it out; with extraordinarily favorable conditions, feasibility and lack of necessity will probably lead to tacit collusion (i.e., price leadership) (2). It is in the realm between--where "feasibility and necessity blend"--that one can find collusion thriving (2). This situation leads one to question which structural aspects of markets affect the feasibility and necessity to collude. It is only after recognizing these factors and their impact that one can analyze a market for its ability to support collusive activity.

Factors Relevant to the Feasibility of Collusion

Number of Firms

The number of firms in a given market plays a significant role in determining whether collusion is likely because it directly impinges upon the ease with which coordination between the involved firms can be achieved. Very simply, the more sellers there are in a given market, the

more difficult it is to maintain price at a level significantly greater than cost (1).

There are several reasons for this. First, as the number of sellers of a product increases and the share of the output contributed by firms in a conspiracy decreases, the more likely firms are to ignore the impact of their behavior and pricing policies on the overall market price structure. Thus, sellers in large markets lose awareness of how their individual pricing decisions hurt (or help) their rivals. As a consequence, collusive agreements in a market with a large number of sellers (greater than 10) tend to dissolve more readily than those with fewer participating sellers (less than 10) (1). Second, as the number of firms increases, the chance of having an independent firm with its own pricing policy increases. If such a firm were to supply a significant portion of the market's demand for the good, it would create a major problem for the other colluding firms (1). The fewer firms involved, the less likely there is to be such a maverick in the group. Third, as the number of sellers increases, the more divergent the ideas about the most advantageous price at which to sell the product. Divergent ideas are obstacles to setting prices, yet they are inevitable given the variability of firm size, cost structure, and other aspects of the market (5). However, with fewer firms this possibility is less likely, and agreements are reached more rapidly.

Perhaps one of the most significant reasons for the increased difficulty of coordination with more firms is the increased costs of coordinating behavior for the group. Economist Almarin Phillips postulated that the difficulty of achieving an agreement rises exponentially with the number of firms. Thus a breakdown in any one communication arena can lead to serious consequences elsewhere (1). This is not to suggest that collusion requires a small number of firms to be feasible, only that a small number of firms is more conducive to collusion than many firms. If there are very few firms involved (two), tacit rather than overt collusion will most probably occur. Coordination among a large group of firms is possible: trade associations often serve as a guise for collusive arrangements. However, successful collusion usually depends on a small number of sellers.

Industry Concentration

The effect of industry concentration (percentage of the market controlled by the four to eight top revenue earning firms) is still being debated. Many studies have been conducted to determine the effect of concentration on the market. The question arises as to whether highly concentrated industries (where, for example, the top four firms control 80% of the total output) are more likely to participate in collusive activity than are firms in less-concentrated markets. The conclusion reached in most studies is that profits do rise with increasing concentration (1). This leaves open the possibility that these firms maintain their profits through collusive activity. However, it is also agreed that highly concentrated industries can collude tacitly (that is, without formal agreements) by recognizing their mutual interdependence. The resulting behavior, which is called "conscious parallelism," is not per se

illegal. In such a market, it is argued, there is no need for overt collusion. One might want to reflect, however, on the fact that a high degree of interdependence, if recognized by the participants in the market, might quite naturally lead to collusion (5). Hay and Kelly found in a study of a sample of 65 cases brought to court that "the preponderance of conspiracies lasting ten or more years were in markets with high degrees of concentration" (5). This seems to corroborate the theory many economists find most plausible: Firms with moderate to high four-firm concentration ratios are most prepared to foster collusive activity (35).

Nature of the Product

The nature of a product in a given market can play an integral role in defining the structure of the market and, in turn, can influence the feasibility of collusive activity. Products are generally described as either homogeneous or heterogeneous within their market. If the products are described as homogeneous, this means that in the consumer's mind there is little or no relevant difference among the products. Put simply, the goods are perfect substitutes for one another (1). Economists thus use the term "homogeneous" (1) to denote that the elasticity of substitution among products is high (i.e., if the price changes slightly, consumers will alter the quantities purchased by a significant amount), (2) to describe a situation in which the product is not complicated but comes in different grades and types, and (3) to denote homogeneous overtime with stable qualities (5). Each type of homogeneity contributes to the degree to which individuals regard the products as substitutes. In a homogeneous market, though, there is only one dimension along which rivalry can occur: price. Thus it is easier to reach an agreement in a market with homogeneous products, as one must agree only upon price (1).

In a heterogeneous market, the products are not perfect substitutes for each other because the consumer perceives relevant differences between them. Markets in which such products are offered make coordination among producers more difficult because there are many dimensions of the products on which agreement is required before collusion can be effective (3). Dimensions that may require coordination include real or imputed product quality differences, spatial differentiation (transportation cost differences), customer-made-to-order differences, and more (1). Any disparity concerning these or other dimensions creates complexities that make it difficult to reach an agreement. In such markets there are often attempts by producers to standardize the product in order to afford them the opportunity to collude (3). Nevertheless, homogeneous product markets most often facilitate collusion.

Rate of Technological Change and Industry Growth

The rate of technological change in a given product market can also affect the structure of the market and the probability of collusive activity. Its effect is similar to that of the homogeneity or heterogeneity of the product in that the degree of technological change affects the ease with which an agreement can be brought about between

potential co-conspirators. When a product market is undergoing a large degree of technological change, the product is not stable over time; hence, it becomes more difficult to arrange any long-term agreements (3). Ultimately, the costs of maintaining an agreement are increased because terms must be renegotiated with each technological change. There would naturally be less cost with a stable, unchanging product, as the agreement could remain in effect as it was initially designed, barring unforeseen difficulties. However, in a market with frequent technological advances in the product or production processes, the innovating firm is a threat to all other firms. If the innovations allow the firm to increase its market share, it will be an even larger threat (7). Furthermore, the more rapidly a producer's cost functions are altered through innovation, the more unevenly the profits generated by collusion are distributed throughout the industry and the greater the influence on the performance of any price fixing agreements. Conspiracies depend on the stability of certain market characteristics, and because innovation affects the most significant factor, i.e., constancy of members' market shares, one would expect it to have a large impact on the ability to coordinate activities and prices (8).

The rate of growth of an industry can similarly affect market structure, particularly if the industry is experiencing significant growth. Because firms rely on maintaining a constant share of the market, in an industry with rapid growth, it is difficult to determine shares of the market among colluding firms. It also is difficult to police a collusive arrangement for price cutting in a rapidly expanding market because increases in market share may be a result of increased demand rather than price cuts. A conspiracy favors status quo and is thus more likely if market shares are relatively constant over time and demand fluctuations are moderate (8). In the case of the rapidly growing VDOT construction program, the conditions are clearly not pro-collusive.

Type of Sale

Another factor that can, and usually does, affect the way a product market functions is the size distribution of orders over time. The frequency or infrequency of sales, as well as the "lumpiness" or evenness of the size of sales, affects an industry's ability to coordinate. In this context, collusion is least likely "with large infrequent orders at irregular intervals" (1). A firm that is in a conspiracy constantly weighs the gains and the losses from possible undercut bidding. The gains to a firm from undercutting co-conspirators are great on large orders, particularly if the probability of getting such an order is low (irregular). The firm must consider, however, the possibility that rivals will do the same later, thus driving down future prices and consequently future profits (1). Nevertheless, some firms are willing to risk retaliation if the immediate gain would be large enough. Thus a large order, one that is above a certain size relative to the seller's aggregate sales, makes this route of secret price concessions very attractive (1). If only a few orders a year are large, the temptation to cheat on a collusive agreement will be even greater. Ultimately, the effect of "lumpy," infrequent orders is to increase the cost of policing any conspiracy formed in such an environment, rendering collusion unlikely, though it is within this

framework that collusion is most needed to gain profits and to avoid cut-throat competition.

A market is, therefore, more conducive to collusion if it has small, frequent, regular orders. Under these circumstances, the payoff from undercut bidding is not as lucrative, thus conspirators have few incentives to cheat.

Secret Dealings and Sealed Bidding

If prices offered by sellers to particular buyers are kept secret, the operation of the market will be affected. In particular, if a seller can provide price concessions to a buyer without other sellers learning of it, he will have a distinct advantage in gaining a larger market share. In addition, he will not lose profits on other buyers if the terms of his sale to the special buyer are kept secret. Thus the degree of secrecy concerning prices in a market can affect it when the conspiracy succeeds.

The threat of rival retaliation allows collusive conspiracies to thrive. Therefore, secrecy is contrary to the aims of a group considering collusion. In fact, a collusive arrangement can survive only if there is a mechanism to detect cheaters (price cutters) and subsequently punish them. The sealed bidding process is hailed as the answer to every co-conspirator's dream. Conspirators need price information to discover cheating, and this practice literally does the work for them.

The sealed bidding process involves requests for bids with detailed specification of terms desired; would-be suppliers tender sealed price quotations in response. The key to the process for conspirators is that all responses are opened publicly on a set date, with the lowest bid winning. Since the results are announced publicly, conspirators are provided with an excellent mechanism for detecting cheating. The process greatly reduces the cost of obtaining this type of enforcement information (7). Since conspirators know that any cheating will be detected immediately, the incentive to cheat is greatly reduced (5). Economist Paul Cook said it best: "it would . . . be hard to find a device [that is, sealed bidding] less calculated to foster open and aggressive competition among sellers" (1). The likelihood of collusion depends on the ease with which an agreement can be reached and the means to monitor cheating. In sealed bid markets, the second issue is eliminated by the announcing of the winning bids, so it is necessary only to reach an agreement (4).

Elasticity of Demand

A market that experiences an inelastic demand for its goods is conducive to collusion. In such markets, if the price of the good goes up or down, quantities demanded will not be significantly affected. If demand for an industry's products is relatively inelastic, then any conspiracy to raise prices above the competitive level will simply result in higher revenues because quantities demanded will not be reduced significantly as prices rise. Such a conspiracy would have to ensure that all suppliers of substitutes were included in the conspiracy so that a

potential buyer would not escape the higher-priced product by choosing a suitable substitute (7).

The association of price fixing with industries that have inelastic demand curves is based on the argument that the penalties for failing to fix and raise prices, in terms of lost profits, are high and the rewards of high fixed prices are great (8). Thus, the likelihood of collusion increases markedly with an inelastic demand curve. Once again, this is not to suggest that collusion occurs only in such instances, only that the chance of its occurrence is enhanced by such an environment. Ultimately, an inelastic demand is a major influence on conspiratorial stability. The more inelastic industry demand is, the more profitable the conspiracy and the greater the incentive for its continued life (8). In an industry with elastic demand (in which increased prices result in falling total revenues), a conspiracy is not likely to be profitable and hence will probably dissolve.

Industry Social Structure and Trade Associations

The social structure of an industry also affects its conduct; yet, it is difficult, if not impossible, to measure in economic terms. The industry's social structure also affects the market by affecting the ability of competitors or conspirators to coordinate pricing behavior (1). In the case of a conspiracy, social structure may also affect the arrangement's stability.

"Industry social structure" refers to the social makeup and interaction of sellers in the market. Often, industries are close-knit and competitors are friendly with each other, respect each other, and share a spirit of camaraderie. If there is strong discipline within the industry (in the sense of following a predetermined path that benefits all of the sellers), it may help avoid discord, ruinous price wars, and cut-throat competition in difficult times (1) and facilitate collusive arrangements. On the other hand, industries with producers from diverse backgrounds with different styles of doing business and different goals will not be as likely to participate in collusive arrangements (1). If there is an independent seller (a maverick) in a close-knit group, collusion will once again be unlikely. In addition, the strength of industry leadership may affect the creation of collusive agreements, and a strong leader may be enough of a force to create a conspiratorial ring in an entire product market. In the early stages of every conspiracy someone must take the lead in establishing lines of communication and organizing meetings. Often a dominant firm will take this step and become the leader, or, in essence, the chairman of the ring (8). The firm could also preclude collusion for the entire industry if it were opposed to such ideas.

One may still wonder how such bonds are formed between apparent rivals; it could be as innocent as informal social contacts at trade associations that foster tacit or explicit collusion (5). This concern has led trade associations to come under increasing fire. Trade associations, by the very nature of their concerns and functions, raise serious questions for those seeking to prevent market collusion. They

present ideal opportunities for conversations about prices under the auspices of performing functions that are within the bounds of the law. Yet research shows that 30% of all cases brought by the government involve trade associations (3): In a study involving 50 antitrust cases, Kuhlman found that trade associations were named as co-defendants in 23 (7). In summary, it is generally accepted that the "larger the portion of the industry encompassed by trade associations, the more conspiracy you'll expect to find" (8).

Production Costs

Production costs clearly affect the functioning of markets. The "more costs differ from firm to firm (in a product market), the more trouble the firms will have maintaining a common pricing policy" (1). Thus if collusion is a viable option, vastly differing production costs may foreclose this possibility, as joint maximization of profits for the individual sellers will be less likely in such a market. "Widely divergent costs across firms breeds divergent opinions concerning the optimum price" (3). While the most efficient means to handle the problem of divergent costs is to shut down inefficient plants and pool the profits to rewardable firms, such behavior is usually obvious to antitrust prosecutors and is not, therefore, undertaken.

High fixed costs present special difficulties for potential colluders. Fixed costs are costs that do not vary as output changes. They include building rent, equipment capital cost, insurance, etc. Industries with high fixed costs (i.e., cement, steel, aluminum) are more susceptible to pricing discipline breakdowns when demand falls. For example, if demand falls, capital will go unused and it will become very tempting to reduce price and expand output, sales, and general revenue to offset the effect of the high fixed costs (5). However, if more than a couple of firms choose this course of action, prices will fall rapidly. Thus agreements in industries characterized by high fixed costs (capital intensive production processes) become fragile and subject to disintegration with each downward turn of demand (5). In essence, excess capacity functions as a powerful incentive to cheat and can cause widespread departure from fixed prices. The incentive to cheat is greater for firms with high fixed costs because "individual firms can gain high profits not only from additional business, but from the decrease in cost associated with higher output" (8). The pressure to cheat is less if fixed costs are low. Thus, the cost structure can play an integral role in an industry's ability to maintain collusive arrangements.

Barriers to Entry

A barrier to entry is anything that prevents prospective sellers or producers from entering a given market. Barriers to entry play a significant role in determining the complexion of an industry because "the condition of entry into a market determines the possibility for long-term profits" (9). If entry is relatively easy, high profits cannot be sustained, as they will entice new entrants into the market. Therefore, if a market is to enjoy continued high profits generated by collusive

arrangements, there must be some barrier to prevent entry of rivals; otherwise, the degree of pricing discretion for established firms will become quite limited. Many things, however, can function as a barrier to new entrants: absolute cost advantages, economies of scale, product differentiation, or something less categorically specific (9). Absolute cost advantages may arise because of patents, trade secrets, and contracts that foreclose certain factors of production from use or distribution proximity. Economies of scale can be a barrier to entry if a firm must maintain a large output level to achieve reasonable production costs. Product differentiation is also an effective barrier as consumer brand loyalty may make buyers reluctant to try a new product. There may also be legal obstacles, licensing requirements, labor contracts, or any number of other things that function as an entry barrier (9).

Barriers to entry are particularly important to firms considering collusion because to the extent that collusion yields high profits, others will try to enter the market; the success of the collusion revolves around being able to keep them out. Therefore, a market with low barriers to entry is less likely to form and be able to maintain collusive agreements than one with high barriers (7). Essentially, collusion will not be successful unless there are effective barriers to entry.

Supporting the VDOT Antitrust Monitoring Program

The ten categories of market characteristics shown in Table 1 offer a basis on which to examine Virginia's construction markets to establish the extent to which, if at all, any markets exhibit characteristics that facilitate collusion. This information can then become an integral part of VDOT's antitrust monitoring and detection program. Superficially, highway construction markets exhibit several characteristics that have been shown to facilitate collusion. The industry produces fairly standardized products (i.e., asphalt), appears to have relatively high barriers to entry because of capital costs, and has firms likely to experience similar production costs throughout a given market. Technological innovation appears to be slow in the construction industry, and the sealed bidding process only enhances the opportunity for collusion. It is this type of information that needs to be empirically verified to determine if such a list of factors could be helpful in identifying any markets in which collusion may be likely.

Thus there are several logical steps to take from here: (1) define the major highway construction markets in Virginia in terms of number of sellers, concentration ratios, rate of growth, geographical boundaries, the number and size of contracts, etc.; (2) analyze each market for conduciveness to collusion on the basis of the factors shown in Table 1; and (3) analyze available BAMS tests for collusion on the basis of these factors.

Table 1

Market Characteristics Relevant to Examining
Potential for Collusive Behavior

Number of Firms
Industry Concentration
Product Characteristics
Technology Change
Type of Sale
Type of Bidding
Demand Elasticity
Industry Social Structure
Production Cost
Entry Barriers

LEGAL ASPECTS OF ANTICOMPETITIVE BEHAVIOR

Introduction

The previous sections have discussed the economic theory of anticompetitive behavior and has set out the framework needed to examine the Virginia highway construction industry empirically. While the economic inquiry is useful for understanding the causes and effects of anticompetitive behavior, the legal system is concerned with providing the proper incentives to deter such behavior and the remedies for those injured by it. This section is an overview of state and federal antitrust law and its application to the highway construction industry. Its value lies in identifying for the VDOT Antitrust Monitoring and Detection Unit the general view of the courts in interpreting law, implementing policy, and detecting collusion.

Antitrust laws in the United States are based on the premise that free and open competition will provide optimum efficiency in our economic system while still preserving the democratic nature of our society. (See, Northern Pacific Railway v. United States, 356 U.S. 1 [1958]). While the focus here is on the federal law of antitrust, the antitrust provisions in the Code of Virginia share a common theoretical basis with the federal law. (See, e.g., Net Realty Holding Trust v. Franconia Properties, Inc., 544 F. Supp. 759 [E.D. Va. 1982]). The primary differences between state and federal law concern procedures, penalties, and jurisdiction. While these differences are significant, they are not discussed here because they relate more to the prosecution of cases than to the detection of antitrust violations. Nevertheless, a summary of the applicable Virginia statutes is provided and the operation of these provisions will be clear once the federal statutes are understood.

The most significant antitrust provision is the Sherman Act of 1890. (15 U.S.C. §§ 1-7 [1973 & Supp. 1988]). Section 1 of the Act is of primary importance to the highway construction bidding process and, in general terms, prohibits concerted action in restraint of trade. An obvious example of a Section 1 violation is a conspiracy among contractors to rig bids.

In addition to Section 1, the substantive federal antitrust statutes include Section 2 of the Sherman Act (15 U.S.C. 2 [Supp. 1988]), the Clayton Act of 1914 (15 U.S.C. §§ 12-27 [1973A & Supp. 1988]), and the Federal Trade Commission Act of 1914 (15 U.S.C. §§ 41-44 [1973A & Supp. 1988]). Section 2 of the Sherman Act prohibits the restriction of competition through monopolization or attempted monopolization. The Clayton Act of 1914 was intended to fill loopholes in the broad wording of Section 2 and to deal with incipient threats to competition that Section 2 may not reach. (United States v. Penn-Olin Chemical Co., 378 U.S. 158 [1964]). The Federal Trade Commission Act is a sweeping provision that grants jurisdiction to the Federal Trade Commission to deal with a broad range of unfair methods of competition. A discussion of the applicability of these statutes to the highway construction industry is provided in the several sections that follow.

The wording of the antitrust laws is broad and does not provide much guidance for their application to specific business practices. The Sherman Act is particularly vague and authorizes civil remedies and criminal penalties with brief phrases that define both the prescribed conduct and the jurisdictional reach in the most general of terms. (United States v. United States Gypsum Co., 438 U.S. 422 [1978]). The legislative history shows that the legislators recognized that the courts would have a significant role in shaping the scope of the Act. However, even with nearly a century of judicial elaboration on the antitrust statutes, clear rules for applying the laws have not been developed. Rather, the antitrust cases largely continue to apply "open-ended and fact-specific standards" for determining liability. (Id., at 438).

The discussion in this section is intended to introduce the reader to the general scope and application of the antitrust laws. Fortunately, the offense of most relevance here, bid rigging, is subject to a per se prohibition under both state and federal law. Analysis of bid rigging cases does not involve sophisticated legal or economic theory.

Following the discussion of the antitrust statutes, the application of the statutes to specific business practices is outlined. Recent experience with bid rigging offenses is discussed at the end of the section. The purpose of this discussion is to identify the types of evidence the courts have deemed relevant to proving antitrust violations.

Restraints of Trade--Section 1 of the Sherman Act

Since early times, the policy of the common law courts was to discourage arrangements among tradesmen that might restrain trade. In furtherance of this policy, the courts refused to enforce promises to refrain from practicing one's trade.

At first, the prohibition of such restraints of trade was absolute. As time passed, however, it became clear to the courts that many covenants in restraint of trade serve legitimate purposes and should be enforced. For example, in Mitchel v. Reynolds, 1 P. Wms. 181 (K.B. 1711), a baker promised that for five years he would not compete in the immediate area of the bakery he sold to the plaintiff. The contract was upheld because the

restraint on trade was ancillary to the principal transaction and was limited in time and territorial scope. Eventually, the prohibition of such agreements was relaxed to the point that English courts enforced even naked restraints of trade. The parties to the agreements were considered the best judge of the reasonableness of the restraints, and by the late 1800's, the common law prohibition of restraints of trade was almost irrelevant in England, as the exceptions equalled the rule.

In 1890, Congress passed the Sherman Act, which according to the Supreme Court, was intended to be a codification of common law principles. (Standard Oil Co. v. United States, 221 U.S. 1 C60 [1911]). Section 1 of the Act states that "[e]very contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations, is declared to be illegal" (15 U.S.C. 1). The purpose of the Act was stated by the Court in Northern Pacific Railway v. United States, 356 U.S. 14 (1958):

The Sherman Act was designated to be a comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade. It rests on the premise that the unrestrained interaction of competitive forces will yield the best allocation of our economic resources, the lowest prices, the highest quality and the greatest material progress, while at the same time providing an environment conducive to the preservation of our democratic political and social institutions. But even were that premise open to question, the policy unequivocally laid down by the Act is competition.

Three elements must be proven to establish a Section 1 violation: (1) a contract, combination, or conspiracy among two or more separate entities, (2) an unreasonable restraint of trade, and (3) an agreement that is in or affects interstate or foreign commerce. Let us consider the standards used by the courts to decide whether each element has been proven.

Contract, Combination, or Conspiracy

The crux of a Section 1 violation is concerted action that restrains trade. The statute does not cover independent behavior by separate entities no matter how anticompetitive the behavior. (Modern Home Institute, Inc. v. Hartford Accident and Indemnity Co., 513 F.2d 102, 108 [2d Cir. 1975]). This section discusses the criteria for determining whether a "contract, combination . . . , or conspiracy" exists, and for distinguishing independent behavior and concerted action.

The terms "contract," "combination," and "conspiracy" have been given slightly different meanings under Section 1 than the meanings used in other areas of the law. (Pearl Brewing Co. v. Anheuser-Busch, Inc., 339 F. Supp. 945, 950 [1972]). Although each of the terms have slightly different definitions, the essential element of each is "conscious commitment to a common scheme or to some type of joint action." (Id. at 951).

While the traditional definition of a contract is an agreement to do or not to do a particular thing in exchange for a legal consideration, for the purposes of Section 1, the formal requirements of contract need not be met specifically. The term "contract" in Section 1 refers to an agreement to pursue a common scheme to restrain trade.

For all practical purposes, the terms "combination" and "conspiracy" are synonymous. (See Rahl, *Conspiracy and the Anti-Trust Laws*, 44 Ill. L. Rev. 743, 744 n.5 [1950]). "Combination" is typically defined as "a union or association of two or more persons for achieving a common object" (Pearl, 339 F. Supp. at 950 citing Northern Securities Co. v. United States, 193 U.S. 197 [1904]). The term "conspiracy" as used in Section 1 "is readily defined as a joint undertaking extending over a period of time with a common purpose, intent, or design resulting from a combination or agreement, express or implied, to accomplish a lawful end by unlawful means." Id. Combinations and conspiracies differ from contracts in that an express agreement is not required to establish a combination or conspiracy under Section 1. A tacit understanding is sufficient to constitute a combination or conspiracy under Section 1. (United States v. General Motors Co., 384 U.S. 127, 142 [1966]).

In summary, while under many criminal statutes an overt act in furtherance of a conspiracy is an essential element of the offense of conspiracy (see, e.g., 18 U.S.C. 371), Section 1 differs in that it punishes the act of contracting, combining, or conspiring to restrain trade, whether or not an overt act is shown.

State of Mind of the Offender

A significant characteristic that distinguishes a criminal violation from a civil violation under Section 1 is the prescribed state of mind the offender must have before a violation is proven. A civil violation can be established by proof of either an unlawful purpose or an anticompetitive effect of the collaborator's activities. (United States v. Container Corp., 393 U.S. 333, 337 [1969]). The state of mind needed to establish a criminal violation under Section 1 depends on the type of offense and on whether the defendant's actions resulted in actual anticompetitive effects.

The type of offense involved is relevant because certain activities are per se violations of Section 1 regardless of whether the conspirators had the intent or ability to bring about anticompetitive effects. (See the discussion of Rule of Reason and the Per Se Rule below.) In cases involving such per se violations, the government need not show that the defendant intended the results or even that he knew that anticompetitive effects would follow. The government need only show that the defendant knowingly engaged in the prescribed acts or, in other words, that the actions were not the result of mistake or accident on the defendant's part. (United States v. W. F. Brinkley & Son Construction Co., 1986-1 Trade Cases [CCH] ¶ 66, 963 [4th Cir. 1986]).

In cases proceeding under a rule of reason approach, the requisite state of mind depends on whether the challenged conduct actually caused

anticompetitive effects. If anticompetitive effects are shown to have resulted from a defendant's conduct, the government must show that the collaborators knowingly engaged in the conduct with knowledge of the probability of anticompetitive effects. (United States v. United States Gypsum Co., 438 U.S. 422, 438 [1978]). If anticompetitive effects are not demonstrated, a criminal violation is not established unless it is proven that the defendant had the purpose to engage in anticompetitive behavior. (United States v. Griffith, 334 U.S. 100, 105 [1948]).

Distinguishing Concerted Action and Competitive Behavior

In many cases it is difficult to distinguish independent business behavior that is legitimately competitive and concerted action constituting a violation under Section 1 of the Sherman Act. The issue of whether concerted action exists in a particular case arises in three contexts: horizontal relationships, vertical relationships, and intraenterprise relationships.

Consciously parallel behavior among competitors is often cited as circumstantial evidence of concerted action in horizontal contexts. (ABA Antitrust Section, Antitrust Law Developments 3 [2d ed. 1984]). For example, in Interstate Circuit, Inc. v. United States, 306 U.S. 208 (1939), the Supreme Court upheld a finding that a group of movie distributors conspired even though there was no direct evidence that the distributors had ever communicated an intent to conform to a common scheme. The case involved a group of theater owners who wrote a letter to each of the distributors requesting that they conform to a scheme to restrain the distribution of first-run movies. There was no evidence of communication among these distributors concerning the details of the scheme, but the letter from the theater owners showed the names of each of the distributors so that each distributor knew the others had been requested to conform. The Court found concerted action on the part of the horizontally-related distributors because they knew that concerted action was invited, that cooperation was vital to the success of the plan, and "[t]hey knew that the plan, if carried out, would result in a restraint of commerce . . . knowing it, all participated in the plan" (*Id.* at 226-27). A horizontal conspiracy was established even though the only communication was between vertically-related firms (the theater owners and the distributors), and no express agreement among horizontally related firms (the distributors) was shown.

Interstate Circuit may be read as a prohibition of consciously parallel, noncompetitive behavior under Section 1. However, in Theater Enterprises, Inc. v. Paramount Film Distributing Corp. (348 U.S. 537 [1954]), the Supreme Court made it clear that Circuit was much more limited than that. In Theater Enterprises, the Supreme Court stated that consciously parallel behavior among competitors "is admissible circumstantial evidence from which the fact finder may infer agreement. But [the Supreme] Court has never held that proof of parallel business behavior conclusively establishes agreement or, phrased differently, that such behavior itself constitutes a Sherman Act offense." (*Id.* at 541).

After International Circuit and Theater Enterprises, the relevant question regarding concerted action in horizontal cases is what additional evidence is required to show that parallel behavior is the result of an illegal agreement and not independent, rational, competitive decision making. One court has proposed a two-part test under which plaintiffs must show that the defendants appeared to be acting against their self-interest, and that the defendants had a motive for entering into an agreement. (Antitrust Law Developments, supra at 5 [citing Schoenkopf v. Brown & Williamson Tobacco Corp., 736 F.2d 205, 208 [3rd Cir. 1980]]). Other factors deemed relevant by the courts include simultaneous, identical actions following meetings among competitors (Pittsburg Plate Glass Co. v. United States 260 F.2d 397, 400-01 [4th Cir. 1958], aff'd, 360 U.S. 395 [1959]) or raising prices in times of surplus (C-O-Two Fire Equipment Co. v. United States, 197 F.2d 489, 497 [9th Cir.], cert denied, 344 U.S. 892 [1952]).

In vertical contexts, concerted action in violation of Section 1 may involve the use of third parties by one firm to enforce restrictions on a vertically-related firm, termination of or imposition of additional restraints on dealers by a manufacturer or wholesaler following complaints from competing dealers, or agreements between plaintiff and defendant. (Id. at 7). These activities are not as directly relevant to the bidding process, however, as are the horizontal restraints.

Some cases involve intraenterprise agreements. In such instances, the issue is whether different parts of the same firm are capable of conspiring. In Copperweld Corp. v. Independence Tube Corp. (467 U.S. 752 [1984]), the Supreme Court held that a corporation and its wholly-owned subsidiary were incapable of conspiring because they had common economic purposes.

Since Copperweld, the law is not clear as to the ability of a parent company to conspire with a subsidiary it does not completely own. In addition, courts' decisions are split as to whether affiliates of a common parent company are capable of conspiring. (See Antitrust Law Development [2d ed.], First Supplement 1983-1986 at 6). The relevant inquiry in any such case is of course whether the "collaborators" had independent economic interests that would be considered in competition in the absence of an agreement. If competition would not be found even in the absence of agreement, Section 1 is not applicable.

Proving Restraints Are Unreasonable

If the Sherman Act were applied literally, it would prohibit all concerted action in restraint of trade. But, in Chicago Board of Trade v. United States, 246 U.S. 231 (1918), the Court pointed out that "e[very] agreement concerning trade, every regulation of trade, restrains. To bind, to restrain, is of their very essence." Therefore, the Court has construed the Act to prohibit only unreasonable restraints. (Standard Oil Co. v. United States, 221 U.S. 1, 58 [1918]).

The courts use two types of analysis to determine whether a restraint is unreasonable: the rule of reason and the per se rule. Rule of reason

is the prevailing standard of analysis under Section 1. (Continental T.V., Inc. v. GTE Sylvania, 433 U.S. 36, 49 [1977]). This method is used when the challenged restraint is such that its effect on competition cannot be evaluated without considering "the facts peculiar to the business, the history of the restraint, and the reasons why it was imposed" (National Society of Professional Engineers v. United States, 435 U.S. 679, 692 [1978]).

Per se analysis is appropriate when the challenged activity is inherently anticompetitive and when the inquiry into the harmfulness of the activity would be difficult and uncertain.

Rule of Reason

The reader will recall that the Supreme Court first held that Section 1 prohibited every agreement in restraint of trade. The scope of the act was subsequently narrowed by the Court. (See United States v. Joint-Traffic Association, 171 U.S. 505 [1898] and Hopkins v. United States, 171 U.S. 578 [1898]). In 1911 the rule of reason was first announced in Standard Oil Co. v. United States, 221 U.S. 1, 60 (1911):

[T]he standard of reason which had been applied at the common law and in this country in dealing with subjects of the character embraced by the statute was intended to be the measure used for the purpose of determining whether, in a given case, a particular act had or had not brought about the wrong against which the statute provided.

The formulation of the rule of reason most often cited by the courts was given by Justice Brandeis in Chicago Board of Trade v. United States, 246 U.S. 231, 238 [1918]:

The true test of legality is whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition. The court must ordinarily consider the facts peculiar to the business to which the restraint is applied; its condition before the restraint was imposed; the nature of the restraint and its effect, actual or probable. The history of the restraint, the evil believed to exist, the reason for adopting the particular remedy, the purpose or end sought to be obtained, are all relevant facts. This is not because a good intention will save an otherwise objectionable regulation or the reverse; but because knowledge of intent may help the court to interpret facts and to predict consequences.

The courts generally use a three-step analysis in rule of reason cases (Areeda, Antitrust Law, ¶ 1502 [1986]): First, the plaintiff must show that competition in a specified market has been restrained by the collaborator's activities. Once this threshold has been reached, the burden shifts to the collaborators to show that they imposed the restraint with legitimate objectives in mind--in other words, that the restraint has significant redeeming virtues. If the collaborators meet this burden, the

plaintiff can still prevail by showing that the legitimate objectives could have been achieved with fewer anti competitive effects. By this point, most cases will have been resolved one way or the other. If not, the pro-competitive effects are weighed against the anticompetitive effects to determine whether the restraint is, on balance, reasonable. Id.

Recent Supreme Court cases have emphasized that the rule of reason inquiry is limited to consideration of the positive and negative effects of a restraint on competition, but it is interesting to note that proposed defenses such as improved product safety through restraints on competition have been disallowed consistently. (National Society of Professional Engineers, 435 U.S. 679 [1978]; see also, National Collegiate Athletic Association v. Board of Regents of the University of Oklahoma, 104 S. Ct. 2948 [1984]).

Per Se Rule

The per se rule condemns certain classes of activities that "because of their pernicious effect on competition and lack of any redeeming virtue, are conclusively presumed to be unreasonable and therefore illegal without inquiry as to the precise harm they have caused or the business excuse for their use" (Northern Pacific Railway, 356 U.S. at 4 [1958]). The categories of practices that have been held to be per se violations of Section 1 include horizontal price fixing (United States v. Socony-Vacuum Oil Co., 310 U.S. 150 [1940]); division of markets (United States v. Addyston Pipe and Steel Co., 85 F. 271 [6th Cir. 1898], affirmed 175 U.S. 211 [1899]); bid rigging (United States v. Portsmouth Paving Corp., 694 F.2d 312 [4th Cir. 1982]); vertical price fixing (Sylvania, 433 U.S. 36); certain group boycotts (Fashion Originator's Guild v. Federal Trade Commission, 312 U.S. 457 [1941]); and some arrangements whereby the sale of one good is tied to another (International Salt Co. v. United States, 332 U.S. 392 [1947]).

Because the per se rule prohibits entire classes of behavior without analysis of the nature and extent of the resulting harm, it presents the possibility of deterring pro-competitive behavior unless its application is limited precisely to those practices that have been shown to be "plainly" or "manifestly" anticompetitive. (Broadcast Music, Inc. v. Columbia Broadcasting System, Inc., 441 U.S. 1, 8 [1979]).

Even though the per se rule may prohibit some commercial practices that have no harmful effect, it is appropriate because such practices are neither common nor important enough to justify the time and expense of trying to identify them. Moreover, the per se rule is a strong deterrent because the prohibited activities are defined with certainty. Nevertheless, it should be noted that the per se rule and the rule of reason are variations on a single theme: the search for competitive effects. Recent cases exhibit an emphasis on the parallel nature of these two modes of analysis. For example, in NCAA v. Board of Regents, 104 S. Ct. 2948 (1984), the Supreme Court refused to hold that a horizontal restraint on output is a per se violation of Section 1. The Court applied a rule of reason analysis, noticing that "there is, after all, no bright line

separating per se analysis from the rule of reason." (Id. at 2962 n.626) Since the restraints were deemed necessary to the marketing of the product (televised college football games), the defendants were allowed to present evidence in justification of the restraints. Whether NCAA signals a further convergence of the per se rule with the rule of reason is not clear. (See Antitrust Law Developments, First Supplement, pp. 15-16).

Interstate Commerce

The third element of a Sherman Act violation is that the challenged restraint be in or affect interstate or foreign commerce. This element derives from the Commerce Clause of the Constitution and is necessary to obtain federal subject-matter jurisdiction over a particular case. This section discusses the criteria used to determine whether a particular restraint is in or affects interstate commerce; however, because the impact on foreign commerce is generally not relevant to the highway construction industry, it is not considered here.

The reach of the Sherman Act has been construed to be as broad as allowed by the Commerce Clause. (United States v. South-Eastern Underwriters Association, 322 U.S. 533, 558 [1944]). This clause defines the power of the Congress to regulate interstate commerce and has expanded greatly since 1890 when the Sherman Act was enacted. The Supreme Court has "permitted the reach of the Sherman Act to expand along with expanding notions of congressional power" (Hospital Building Co. v. Rex Hospital Trustees, 425 U.S. 738, 743, n.2 [1976]). For example, in McLain v. Real Estate Board of New Orleans, 444 U.S. 232 (1980), the Supreme Court stated that the Sherman Act extends "beyond activities actually in interstate commerce to reach other activities that, while wholly local in nature, nevertheless substantially affect interstate commerce [emphasis added]." The distinction between "in commerce" and "affecting commerce" is important because Congress has chosen to limit other antitrust laws, such as the Clayton Act, to practices that are clearly "in commerce." Thus, it is clear that the jurisdictional scope of the Sherman Act is much broader than that of other antitrust laws.

In Goldfarb v. Virginia State Bar 421 U.S. 773 (1975), the Supreme Court defined the standard for determining whether a practice is "in commerce." A restraint is in commerce if the defendant's business is actually in interstate commerce or, though local in character, is a "necessary" and "integral" part of an interstate transaction. (Id. at 784). In the Goldfarb case, the state bar association set a minimum-price schedule for real estate title search fees. The Court found that real estate sales were interstate transactions because they are often financed with funds from various states. The Court also found that, as a practical matter, title searches are necessary to the completion of these interstate transactions.

The Court devised a two-part test for determining whether a restraint "affects commerce" in McLain, 444 U.S. at 242. To show that a restraint affects commerce, it is first necessary to prove that the local activity of the defendant "has an effect on some other appreciable activity demonstrably in interstate commerce." The Court then considered whether the

defendants' activities, which allegedly had been infected by a price-fixing conspiracy, could be shown "as a matter of practical economics" to have a not insubstantial effect on the interstate commerce involved.

Most antitrust cases in the highway construction industry involve paving companies, which in general are local businesses. For this reason, most highway bid rigging cases proceed under the "affecting commerce" theory. However, since the indictments (or, in civil cases, the complaints) generally allege facts that purportedly would support both jurisdictional theories, it is often not clear from the cases which theory is being used or whether both tests are satisfied. (See, e.g., United States v. Metropolitan Enterprises, Inc., 728 F.2d 444 [10th Cir. 1984]). At any rate, the key "analytical focus continues to be on the nexus, assessed in practical terms, between interstate commerce and the challenged activity" (Crane v. Intermountain Health Care, 637 F.2d 715, 724 [10th Cir. 1981]).

One theory commonly used in highway bid rigging cases to obtain subject matter jurisdiction under the "affecting" test is that during the period covered by the bid rigging conspiracy, the contractor received materials and equipment from suppliers outside the state where the work was done. The premise of this theory is that by rigging highway project bids, the contractors substantially reduced competition for the material and equipment. (United States v. Brighton Building & Maintenance Co., 435 F.Supp. 222, 227 [1977]; United States v. Finis P. Earnest, 509 F.2d 1256, 1258-61 [7th Cir.], cert denied, 423 U.S. 893 [1975]).

Another theory used to show an effect on interstate commerce is that since many projects are financed with federal funds pursuant to the Federal Aid Highway Act, 23 U.S.C. 101-157 (1983), the artificially high prices charged by noncompetitive bidders reduced the amount of federal money available for other highway projects. (Brighton Building & Maintenance Co., 435 F. Supp. at 227). While this theory has been received with approval by the courts, it has been criticized as an unwarranted federal intrusion into state affairs because the contractor is paid by the state government, not the federal government. (See, Stafer, "Operation Roadrunner": The Misapplication of Federal Criminal Sanctions to Bid-Rigging in the Highway Construction Industry, 11 Am. J. Crim. L. 1 [1983]). This criticism is supported by United States v. Azzarelli Construction Co., 647 F.2d 757 (1981) where the Seventh Circuit held that Illinois, not the United States, was the injured party when artificially high prices were charged by bid riggers. This was true because the federal contribution to highway construction was a fixed sum for that year. It was the Illinois treasury whose funds were reduced by the overcharges.

Indictments will often allege that the fact that the Federal Aid Highway Act required the states to obtain affidavits through which the bidders swear that their bids are not the result of collusion shows cooperation between the states and the federal government. The indictments state that this cooperation is evidence of a nexus with interstate commerce.

The primary argument for the use of the "in commerce" theory in bid rigging cases is that the highways are instrumentalities of interstate commerce and that bid rigging impedes the construction of these instrumentalities. (See, e.g., United States v. Allied Asphalt Paving Co., 451 F. Supp. 804, 813, n. 41 [cir. 1978]). However, the courts have not explicitly held that this nexus with interstate commerce is sufficient on its own to establish federal jurisdiction under the Commerce Clause.

Monopolization--Section 2 of the Sherman Act

Section 2 of the Sherman Act provides in part that "[e]very person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several states, or with foreign nations, shall be deemed guilty of a felony. . . ." (15 U.S.C. 2).

While Section 1 of the Sherman Act is concerned with concerted action in restraint of trade by more than one person or firm, Section 2 is intended to prevent anticompetitive behavior by the single dominant firm with the market power to control prices or to limit competition. Section 2 prohibits monopolization and attempted monopolization. Two elements are necessary to establish a monopolization offense: "(1) the possession of monopoly power in the relevant market, and (2) willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident" (United States v. Grinnel Corp., 384 U.S. 563 [1966]).

Monopolization is a general intent offense. "General intent" is a common law term that has different meanings in different contexts. Under Section 2, the term means that it is not necessary to show that the monopolist engaged in anticompetitive acts with the specific intent to monopolize a market; rather, the prosecutor need only show that the defendant engaged in activities that created monopoly power in the defendant and which the defendant knew, or should have known, may have anti-competitive effects.

Attempted monopolization consists of (1) a specific intent to monopolize, and (2) a dangerous probability of success. A showing of specific intent is required for attempted monopolization because, unlike a completed monopolization offense, attempted monopolization is not accompanied by anticompetitive effects that would tend to corroborate a showing of unlawful intent to control a market. Attempted monopolization will usually involve some unequivocally anticompetitive behavior such as predatory pricing. (See, e.g., Arthur S. Langenderfer, Inc. v. S. E. Johnson Co., 1984-1 Trade Cases [CCH], ¶ 65, 905 [6th Cir. 1984]).

A notable aspect of Section 2 is the use of the word "monopolize" rather than "monopoly." The distinction is important because Section 2 does not prohibit the possession of monopoly power; rather, the statute is designed to prevent firms from engaging in activities intended to smother competition. Section 2 also prohibits a dominant firm from wielding its monopoly power to unfair advantage, even when its monopoly power was

gained through legitimate means. (Berkey Photo, Inc. v. Eastman Kodak Company, 603 F.2d 263 [2d Cir. 1979]).

The distinction between "monopolize" and "monopoly" underscores the fundamental tension--one might almost say the paradox--that is near the heart of Section 2. On the one hand, the goal of Section 2 is to prevent a stifling of competition by a dominant firm. On the other hand, the intent of the statute is also to encourage firms to use their expertise to improve their competitive position through innovation and hard work. Distinguishing between aggressively competitive behavior and the type of behavior prohibited by Section 2 is often difficult.

Monopolization cases draw heavily on the sophisticated economic theories of industrial organization; however, a thorough discussion of these theories and their application to the law of monopolization is beyond the scope of this paper. The purpose here is to provide a brief introduction to the legal system's approach to monopoly power. For a detailed, yet readable, discussion of monopolization, see Sullivan, Handbook of the Law of Antitrust (2d ed. 1977). For an in-depth treatment of attempted monopolization, see Cooper, Attempts and Monopolization: A Mildly Expansionary Answer to the Prophylactic Approach to Section Two, 72 Mich. L. Rev. 373 (1974).

Mergers--Section 7 of the Clayton Act

Section 7 of the Clayton Act states "[t]hat no person engaged in commerce" shall acquire the assets or stock of another person or firm where "the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly" (15 U.S.C. 18). "The grand design of the original Section, as to stock acquisitions, as well as the Celler-Kefauver Amendment, as to the acquisition of assets, was to arrest incipient threats to competition which the Sherman Act did not reach." (United States v. Penn-Olin Chemical Co., 378 U.S. 158, 170-71 [1964]). The wording of the statute and subsequent judicial interpretations make it clear that the Clayton Act is concerned with activities that present a reasonable likelihood of a substantial lessening of competition or that may have a tendency toward monopoly. Since the statute is designed to reach incipient threats, the standard of liability is lower than under the Sherman Act.

As with Section 2 of the Sherman Act, evaluation of anticompetitive effects under Section 7 of the Clayton Act requires an economic analysis of the challenged practice in the context of the relevant market. Such an analysis is even more difficult under Section 7 than under the Sherman Act because while the Sherman Act deals with behavior with demonstrated anticompetitive impact or that is blatantly anticompetitive (e.g., predatory pricing), Section 7 requires a prediction of the effect of the challenged practice. "Such a prediction is sound only if based upon a firm understanding of the structure of the relevant market; yet the relevant economic data are both complex and elusive" (United States v. Philadelphia National Bank, 374 U.S. 321, 362 [1963]).

Commonwealth of Virginia Statutes

The Code of Virginia contains several provisions concerning anti-competitive behavior. In general, these statutes are equivalent in substance to their federal counterparts. The purpose of the state statutes, like that of the federal statutes, is to protect competition (Code of Va. 59.1-9.2 [1987]). The following is a brief description of the state statutes of relevance to the highway construction bidding process.

Virginia Antitrust Act, Code of Virginia, 59.1-9.1 (1974)

The Virginia Antitrust Act, Code of Va. 59.1-9.1, has provisions defining the elements of various antitrust offenses and the procedures for investigating and adjudicating specific cases. Unlike the federal antitrust laws, the Virginia Antitrust Act does not provide for criminal sanctions. Section 59.1-9.11 of the Act does provide for civil penalties of up to \$100,000 for each "willful or flagrant" offense (Code of Va. 59.1-9.11 [1987]).

The Virginia Antitrust Act contains three sections that define substantive antitrust offenses (Code of Va. 59.1-9.5 through 9.7 [1987]). The remainder of the Act concerns what may be described as procedural matters. The substantive section of particular importance to the bidding process is Section 59.1-9.5, which is entitled, "Contracts, etc., in Restraint of Trade Unlawful." This section states that "[e]very contract, combination, or conspiracy in restraint of trade or commerce of this State is unlawful" and is essentially equivalent to Section 1 of the Sherman Act. One difference between the two statutes is that Section 59.1-9.5 applies to intrastate as well as interstate restraints. While, in theory, this aspect makes the scope of the Virginia statute broader than the federal statute, in practice, the difference is usually not significant because the test for whether a restraint concerns interstate commerce is easily satisfied. When the restraint concerns the interstate highway system, the courts are sure to hold that interstate commerce is affected. Aside from this rather minor difference, the application of Section 59.1-9.5 is virtually identical with application of Section 1 of the Sherman Act. (Net Realty Holding Trust v. Franconia Properties, Inc., 544 F. Supp. 759 [E.D. Va. 1982]).

The section of the Virginia Antitrust Act concerning monopolization is Section 59.1-9.6. This section is entitled "Monopolies Unlawful" and states that "[e]very conspiracy, combination, or attempt to monopolize, or monopolization of, trade or commerce of this State is unlawful." Section 59.1-9.6 is equivalent to Section 2 of the Sherman Act except that it applies to intrastate as well as interstate commerce.

Section 59.1-9.7, entitled "Discriminatory Practices Unlawful; Proof; Payment or Acceptance of Certain Commissions, etc., Unlawful" is primarily concerned with the types of exclusionary practices prohibited by the Clayton Act, Section 3, and the Federal Trade Commission Act, Section 5.

Conspiracy to Rig Bids, Code of Virginia, 59.1-68.7 (1987)

Section 59.1-68.7 provides:

- A. Any combination, conspiracy or agreement to intentionally rig, alter or otherwise manipulate, or cause to be rigged, altered or otherwise manipulate any bid submitted to the Commonwealth of Virginia or any governmental unit for the purpose of allocating purchases or sales to or among persons, raising or otherwise fixing the prices of the goods or services, or excluding other persons from dealing with the State or any other governmental unit shall be unlawful.
- B. Any person violating this section shall be guilty of a Class 6 felony.

(Code of Virginia 59.1-68.7 ([1987])).

This statute provides criminal sanctions for certain behavior that would be per se unlawful under Section 1 of the Sherman Act. As with the other state statutes, Section 59.1-68.7 applies to intrastate as well as interstate restraints.

Duty to Provide Certified Statement, Code of Virginia, 18.2-498.4 (1987)

Section 18.2-498.4 authorizes state agencies such as the Department of Transportation to require contractors to provide with their bids affidavits stating that their bids are not the result of collusion or fraud. The section makes it a Class 6 felony for such a bidder to knowingly submit a false statement.

Section 18.2-498.4 is broader than the bid rigging statute, 59.1-68.7, in that fewer elements are needed to establish a violation of 18.2-498.4. Under 18.2-498.4, there is no need to prove that the defendant had the intent to rig bids. On the other hand, many bid riggers who fall under 59.1-68.7 are not subject to 18.2-498.4. For example, if a contractor agrees to refrain from bidding against a competitor, that contractor will be in violation of the bid rigging statute. However, since the contractor did not bid, he would not submit a statement of noncollusion and would not be subject to 18.2-498.4.

This section of the Code is similar to Section 18.2-178, which punishes larceny by false pretenses. (Code of Virginia 18.2-178 [1982]). In fact, the Virginia Supreme Court has held that a firm charged with improperly inflating bids to the detriment of the Commonwealth was subject to 18.2-178 where the act took place prior to the enactment of 18.2-498.1 and 59.1-68.6. (Mosteller v. Commonwealth, 222 Va. 143, 279 S.E. 2d 380 [1981]).

Application of the Antitrust Laws to Specific Business Practices

The section presents a discussion of the application of the antitrust laws to specific business practices of relevance to the construction industry. The list of practices is not intended to be comprehensive but is intended to illustrate certain principles and to help the reader understand how the laws relate to conduct that may have anticompetitive effects. An understanding of the basic principles will help the reader to identify patterns and practices that may indicate antitrust violations.

As a general matter, it is important to categorize correctly a given restraint as a horizontal or vertical. Correct categorization is important because horizontal restraints are more likely to be held per se unlawful than vertical restraints. (White Motor Co. v. United States, 372 U.S. 253, 263 [1963]). Vertical restraints often offer pro-competitive benefits that must be weighed under a rule of reason analysis (Continental T.V., Inc. v. GTE Sylvania, Inc., 433 U.S. 36 [1977]), while arrangements among competitors in horizontal relationships are frequently "naked restraints of trade with no purpose except stifling competition" (White Motor Co., 372 U.S. at 263). The anticompetitive practices of direct relevance to the construction project bidding process generally involve horizontal restraints. This section discusses the application of antitrust laws under such conditions.

Price Fixing

Protection against conspiratorial price fixing "is an object of special solicitude under the antitrust laws" (United States v. General Motor Corp., 382 U.S. 127, 148 [1966]), and the Supreme Court has repeatedly found to be per se unlawful those arrangements that either directly or indirectly restrain price competition. (See, e.g., United States v. Trenton Potteries Co., 273 U.S. 392 [1927][Direct price fixing]; United States v. Socony-Vacuum Oil Co., 310 U.S. 150 [1940][Indirect price fixing]).

It is important to note that while conspiratorial price fixing has generally been condemned by the courts, not all restraints on price competition are per se unlawful or even unreasonable restraints under the Sherman Act. The Supreme Court has noted that in some cases horizontal restraints on price competition are necessary if the product whose distribution is restrained is to be offered at all. (NCAA v. Board of Regents of the University of Oklahoma, 104 S. Ct. 2498). In NCAA, the Court decided that restraints on the type of television rights offered by member universities and on the prices to be charged for those rights did not constitute a per se violation of the Sherman Act. The particular restraints imposed by the NCAA were analyzed under the rule of reason and found to be unlawful, but the Court recognized that some restraints may be needed if college sports are to be televised at all.

The Supreme Court has also validated certain price restraints when the restraints were ancillary to a lawful scheme that has pro-competitive effects. In Chicago Board of Trade v. United States, 246 U.S. 231 (1918), the Court approved a Board rule that fixed the prices charged for

commodities traded after working hours at the closing price established at the end of the previous working day. The Court applied a rule of reason analysis and found that the rule was ancillary to the legitimate goal of regulating the operation of the commodities exchange and that the net effect of the rule was to enhance competition.

Cases such as NCAA and Chicago Board of Trade, where price fixing arrangements were analyzed under the rule of reason rather than the per se rule, are exceptional. The use of rule of reason analysis in price fixing is limited to certain industries where some sort of price restraint is needed if the particular product or service is to be offered in a competitive environment. The per se rule is the principal mode of analysis where the challenged restraint has either the purpose or effect of limiting price competition. (ABA Antitrust Section, Antitrust Law Developments [2d ed. 1984], p. 30).

Direct Price Fixing

Agreements to control prices directly are unlawful regardless of whether the fixed prices are reasonable or not. (United States v. Trenton Potteries Co., 273 U.S. 392 [1927]). In this case, the issue was not whether the prices were reasonable but whether the agreement gave the conspirators the power to control prices. The Court noted that:

[t]he reasonable price fixed today may through economic and business changes become the unreasonable price of tomorrow. Once established, it may be maintained unchanged because of the absence of competition secured by the agreement for a price reasonable when fixed. Agreements which create such potential power may well be held to be in themselves unreasonable or unlawful restraints, without the necessity of minute inquiry whether a particular price is reasonable or unreasonable as fixed and without placing on the government in enforcing the Sherman Law the burden of ascertaining from day to day whether it has become unreasonable through the mere variation of economic conditions.

(Id. at 397-98).

Indirect Price Fixing

Often, the courts are required to consider the validity of arrangements that only indirectly affect price. In these cases, the specific facts and market conditions are analyzed to determine whether the challenged business practices amount to price fixing under the Sherman Act. If indirect price fixing is proven, the challenged practice will be per se violative of Section 1. However, the market analysis needed to reach that conclusion can be so involved that the inquiry is almost equivalent to a rule of reason analysis. The most famous case involving indirect price restraints was Socony-Vacuum Oil Co., 310 U.S. 150 (1940). In the mid-1930s, the oil market was swept by a series of price wars caused by excess supply on the market. The excess supply was the result of overproduction by the smaller, independent oil companies. These companies would not

reduce their oil production during periods of low demand because they feared losing customers and because once an existing oil well was abandoned, subsurface changes would make it difficult or impossible to bring the well back into production. Since the small companies did not have sufficient storage facilities for the excess oil, they would be forced to sell the oil at distress prices. These distress sales forced down the price large companies could charge for their oil.

Representatives of the major oil companies and some of the independent companies met in 1935 to find a way to prevent the price of oil from dropping during periods of low demand. It was proposed that the major oil companies would buy the excess oil from the smaller companies. Each major company would select one or more of the independent companies as its "dancing partner." During periods of excess supply, the major company would buy the distress oil from its dancing partner at the prevailing spot market price.

The cartel formed by the oil companies was held per se unlawful because it had the effect of providing a floor below which oil prices would not drop. The oil companies argued that the price index used by the cartel, the spot market price, was determined by the competition in the spot market and that they were not agreeing to a fixed price. The Court rejected this argument because, while the cartel did not eliminate competition, it did reduce competition, and this reduction in competition was sufficient to constitute a per se violation of Section 1. The defendant oil companies attempted to defend the cartel on the grounds that the agreement was intended to prevent "ruinous competition," which would harm the long-term stability of the oil industry. Even if this argument was based on sound economic theory, the Court held that such defenses are not relevant under the Sherman Act. If defendants were allowed to avail themselves of these defenses, the issue of the reasonableness of prices would be raised in every pricefixing case, and the Sherman Act would have been emasculated.

A.B.A. Antitrust Section, Antitrust Law Developments (2d ed. 1984) 33-37, provides a thorough discussion of practices that have been held per se violative of Section 1 as indirectly fixing prices. Most of these practices are not of direct relevance to the highway construction bidding process.

Market Allocation

Market division among competitors was held to be a violation of the Sherman Act in Addyston Steel & Pipe, 85 F. 271 (6th Cir. 1898), modified and aff'd, 175 U.S. 211 (1899). In the years following Addyston, the Supreme Court stated repeatedly that market division was per se unlawful, but those cases always involved market division accompanied by price fixing, by significant market power on the part of the defendants, or by both. (Sullivan, Handbook on the Law of Antitrust, [1977] Section 79; see also, Timken Roller Bearing Co. v. United States, 341 U.S. 593 [1951]; United States v. Sealy, Inc., 388 U.S. 350 [1967]). It was not until 1972 that the Supreme Court made clear that market division is a per se violation of Section 1, whether or not accompanied by price fixing, and

whether or not the conspirators have the market power needed to have a significant impact on the relevant market. (United States v. Topco Associates, Inc., 405 U.S. 593 [1972]).

The defendant in Topco was an association of independent grocery chains that was formed to enhance the competitiveness of the independent stores in relation to the larger national grocery chains. The large chains sold "house brand" products, which they had manufactured and labeled with their own trademark. The smaller chains were at a disadvantage because they did not have the economy of scale to make the house brand system feasible for the larger chains. The smaller chains formed a subsidiary to purchase products with the Topco label and distribute them to the participating grocers. Since the independent grocery chains did not want to have competitors in their area selling house brands with the same label, the arrangement included provisions for allocating exclusive territories to each of the participants.

The Court categorized the arrangement as a horizontal restraint of trade even though the restriction was imposed by the subsidiary, which was in a vertical relationship to each grocery store. The arrangement was agreed upon by competitors who were in a horizontal relationship to each other; thus, the impact of the restraint was to restrict competition in a horizontal context.

In defense of the scheme, the defendants pointed out that the intent of the arrangement was to enhance, rather than inhibit, the competitiveness of the participants and that the territorial aspect of the scheme was necessary if the independent chains were to compete successfully against the national chains. The Court also recognized that the defendants lacked the market power needed to reduce competition in the market significantly. Nonetheless, the Court held the territorial restrictions to be per se unlawful under Section 1.

The most significant aspect of the Topco ruling is that it recognized that the courts are not competent to determine whether a restriction of competition in one sector of the market is justified because it is outweighed by an enhancement of competition in another sector. The fact that an arrangement improved competition by facilitating entry into a particular market or by providing other economies of scale is irrelevant if the arrangement had the effect of precluding firms from competing for the same market.

Defendants in market allocation cases will often try to avoid per se categorization by describing the market allocation scheme as something other than territorial allocation. For example, in COMPACT v. Metropolitan Government of Nashville & Davidson City, 594 F. Supp. 1567 (M.D. Tenn. 1984), a group of architectural firms had agreed to refrain from competing against each other on certain types of contracts offered by the city government. The designated city contracts were to be allocated to a joint venture comprised of the participating firms. The conspirators described the scheme as "subject matter" allocation, but the court stated that the firms could not avoid the antitrust laws through an amorphous definition and, regardless of the semantic characterization, a horizontal allocation

of any element of the market for which businessmen or professionals compete represents a per se violation of the Sherman Act.

Joint Ventures

Treatment of joint ventures under the antitrust laws is complicated by the lack of a clear definition of "joint ventures" and by a lack of consensus regarding the anticompetitive effects of joint ventures. Professor Brodley has proposed the following definition:

[A] joint venture may be defined for antitrust purposes as an integration of two or more separate firms, in which the following conditions are present: (1) the enterprise is under the joint control of the parent firms, which are not under related control; (2) each parent makes a substantial contribution to the joint enterprise; (3) the enterprise exists as a business entity separate from its parents; and (4) the joint venture creates significant new enterprise capability in terms of new productive capacity, new technology, a new product, or entry into a new market. (Brodley, *Joint Ventures and Antitrust Policy*, 95 Harv. L. Rev. 1521 [1982]).

Joint ventures take a variety of forms. Some are created for a single project such as when two contractors combine to submit a joint bid on a particular highway project. Others are long-term arrangements for the development, production, and marketing of products or services, but they present difficult problems of analysis because they often offer both pro-competitive and anticompetitive effects. Joint ventures often enhance competition by enabling the participants to combine resources to develop new technologies or enter new markets. (See *Brunswick Corp.*, 94 F.T.C. 1174, 1265 [1979]; *Yamaha Motor Co. v. F.T.C.*, 657 F.2d 971 [2d Cir. 1981], cert denied, 102 S. Ct. 1768 [1982]). Joint ventures also have the potential for hindering competition. By any definition, a joint venture is formed by two or more separate business entities who would otherwise be acting independently and often in competition with each other. By combining to form a joint venture, the parent firms partially unite their economic interest, ensuring that competition between them is reduced or eliminated.

Joint venture arrangements of relevance to the construction industry are subject to challenge under Section 1 of the Sherman Act and Section 7 of the Clayton Act.

Joint Ventures Under the Sherman Act

Joint ventures are traditionally analyzed under the rule of reason and consider the structure of the joint venture, the conduct and intent of the participants, and the resulting impact on competition. The variables of relevance include the size of the joint venture and the market share held by the participants, the contributions of each joint venturer and the benefits received, the likelihood that any of the individual companies would have the capability or inclination to undertake a similar project in

the absence of the joint venture, the nature of any ancillary restraints imposed by the joint venture agreement, and the reasonableness of those restraints.

While rule of reason is the prevailing mode of analysis in joint venture cases, the courts often apply the per se rule if the venture is found to have elements that fall within the categories of restraint that have been held per se unlawful. A joint venture is more likely to be a per se violation if the individual participants are restricted from making independent marketing and production decisions. (See, e.g., COMPACT v. Metropolitan Government of Nashville and Davidson City, 592 F. Supp. 1567 [1984]).

COMPACT was a joint venture comprised of the only three minority-owned architectural firms in Nashville, Tennessee. The owners of these firms were frustrated by their inability to obtain meaningful work with the cities of Nashville and Davidson City. They claimed the only work they could get was what the joint venturers considered "token" subcontracts on federally-funded projects subject to affirmative action set-asides. In order to improve their chances of obtaining desirable contracts with the city governments, the firms entered into a joint venture agreement that restricted members from bidding against each other on certain minority set-aside projects. In this manner, the joint venturers were able to monopolize the market for minority-owned architectural firms. The agreement also allocated exclusive territories among the firms.

The joint venture was held to be a clear example of market allocation, which is a per se violation of Section 1. In so ruling, the court noted that the scope of the joint venture was not well defined but rather was open-ended without specific, legitimate objectives. (*Id.* at 1576). COMPACT argued that the joint venture was needed for the minority firms to obtain the type of work they sought--major design contracts with significant project control in the hands of a minority-owned firm. They also cited the NCAA case and argued that certain types of restraints, which would otherwise be per se violations, are analyzed under the rule of reason when the restraints are needed if a particular product or service is to be offered at all. The court rejected COMPACT's assertion that minority architectural services could be effectively marketed only through a joint venture and pointed out that although COMPACT did not involve bid rigging as such, the effect was the same. After examining settlement decrees from bid rigging cases, the court concluded that joint bidding arrangements among bidders on construction projects are impermissible unless it is shown that the work described by the bid specifications could not be performed without such a combination (*Id.* at 1578, citing United States v. New England Concrete Pipe Corp., 1959 Trade Cas. [CCH] 69,481 [D. Mass. 1959]), or that the project could not be undertaken by any of the individual firms, or that the individual firms could be competitive on the project (*Id.* citing United States v. General Electric Co., 1962 Trade Cas. [CCH] 70,367 [E.D. Pa. 1962]; United States v. Bituminous Concrete Association, Inc., 1960 Trade Cas. [CCH] 69,878 [D. Mass. 1960]; United States v. Lake Asphalt and Petroleum Co. of Massachusetts, 1960 Trade Cas. [CCH] 69,835 [D. Mass. 1960]).

Bid Rigging

The term "bid rigging" refers to any "agreement between competitors pursuant to which contract offers are to be submitted to or withheld from a third party" (United States v. Portsmouth Paving, 694 F.2d 312, 325 [4th Cir. 1982]). Such an agreement is per se violative of Section 1 of the Sherman Act. Bid rigging schemes may involve price fixing, market allocation, or a combination of these and other acts, but the common element of all bid rigging schemes is that the element of competition is removed from the bidding process. By conspiring with competitors, a bidder can be assured that he will not be underbid. Since price is the only criterion for choosing among qualified contractors on government-funded projects, the bid rigger is assured of getting the contract even when he charges supracompetitive prices.

The following is a description of some practices that have been condemned by courts as bid rigging. The list of practices described is not exhaustive because the design of bid rigging schemes is limited only by the imagination of the participants. The important thing to remember is that if an arrangement among competitors gives a bidder the knowledge that he can inflate his bid above competitive levels and still be low bidder, that arrangement will constitute bid rigging and will be a per se violation of antitrust laws. (See, e.g., United States v. Brinkley and Sons Construction Co., 1986-1 Trade Cases CCH, 66,963 [4th Cir. 1986]). Also, any practice, such as complimentary bidding, that makes noncompetitive bidding easier or more effective is probably a per se violation.

Working Out the Job

"Working out" a job is probably the most basic form of bid rigging. To work out a job, a contractor determines who his likely competitors are on a particular job and then finds a way of either convincing them not to underbid him or to give him something in return for not bidding against them. (United States v. Ashland-Warren, Inc., 507 F. Supp. 433, 438 [M.D. Tenn. 1982]). State bidding procedures facilitate this practice by publishing a list of the contractors who "pulled" or obtained proposals for a given job; this list tells the contractor who his potential competitors are. If the contractor is unable to work out the job, he will normally notify the previously-contacted competitors that the bid rigging scheme is off and that the job will be bid "hard" or "bid the hard way." In some cases, a contractor will work out a deal with the firms he feels are his toughest competitors and will then attempt to underbid the other potential bidders. (See, e.g., United States v. Metropolitan Enterprises, Inc., 728 F.2d 444 [10th Cir. 1984]). Such a scheme would have an advantage in that the conspiracy would involve a smaller, more manageable group, which would promote reliability among the participants and make detection of the collusion more difficult.

Bid riggers use various methods to persuade other competitors not to "bid the hard way." These methods may include payoffs (United States v. Young Brothers, Inc., 728 F.2d 682 [5th Cir. 1984]), agreements to grant subcontracts (Metropolitan Enterprises, 728 F. 2d 444), or promises not to

compete on future jobs (Ashland-Warren, 507 F. Supp. at 439). Contractors may also work out a job by calling in favors owed to them by competitors. Such entitlements, referred to as "having a marker out," are indefinite in nature and are often two or three years in coming. Bid rigging schemes may also involve trading jobs on the same bid letting. The trading may be job-for-job, tonnage-for-tonnage, or dollar-for-dollar.

Bid Rotation

While many bid rigging schemes involve working out specific jobs, bid rotation conspiracies are continuing arrangements in which the conspirators take turns being low bidder. The method of selecting the low bidder will vary from one bid rotation scheme to another, and many such schemes attempt to equalize the dollar amount of work among the participants, while others may be set up to proportion the work according to the size of the various firms involved in the conspiracy.

Market Allocation

Highway construction markets are often allocated by territory (see, e.g., United States v. Koppers Co., Inc., 1981-1 Trade Cases [CCH] ¶ 64,134 [2d Cir. 1980]). The defendants in Koppers were two surface-treatment contractors who engaged in a conspiracy to allocate territories in Connecticut. One of the contractors had its facilities in the eastern part of the state, and the other was based in the western part of the state. The defendants agreed that each would always be low bidder in its region. To accomplish this end, the conspirators developed a system that involved communicating their base costs to the other. Since the two firms were based at opposite ends of the state, the use of common base prices allowed each to be low bidder in its region because it would have lower transportation costs. The scheme also involved the submission of artificially high complimentary bids by the "losing" bidder on each job in order to convince state procurement officials that the job had been bid competitively.

United States v. Portsmouth Paving Corp., 694 F.2d 312 (4th Cir. 1982) involved a bid rigging scheme that combined market allocation with other bid rigging techniques. The defendants in Portsmouth Paving engaged in a conspiracy to allocate the paving markets in the Tidewater region in Virginia. The conspiracy involved paving work in Virginia Beach, Norfolk, Portsmouth, and Chesapeake whereby the Virginia Beach work would be done by the Virginia Beach contractors, and the work in the other three cities would be done by the other conspirators. Within these allocated markets, the conspirators would use various methods to distribute the contracts among the firms.

The government argued in Portsmouth Paving that the goal of the market allocation scheme was to prevent the occasional outbreak of competitive bidding in one market from affecting the prices in the other markets. Without such protection, low prices in one region would lead to lower prices in adjacent regions and the resulting "domino effect" would eventually affect even the most distant member of the conspiracy.

The defendants argued that such a domino effect would not occur because it was not economically feasible for contractors in Portsmouth, for example, to compete against the Virginia Beach firms for work in Virginia Beach because of the increased cost of trying to transport hot asphalt from Portsmouth to Virginia Beach. Therefore, even if prices in Portsmouth were to decrease, the defendants argued, prices in Virginia Beach would not be affected because the Portsmouth contractors were not in competition with the Virginia Beach contractors. The court, however, rejected the defendant's argument and found that the evidence supported a finding of market allocation.

Subcontracts

While using competitors as subcontractors is not illegal per se, it is often necessary to consider whether such subcontracts are the result of collusion. In Metropolitan Enterprises, a contractor convinced a competitor not to bid against him on a package of construction contracts that were simultaneously let for bids by the state of Oklahoma. Oklahoma procurement regulations allowed the use of "tie bidding," which means that contractors had the choice of either bidding individual sections of highway work or to try bidding low on a combination of multiple sections. Broce Construction Company convinced Metropolitan Enterprises not to bid competitively for any of the work by agreeing to subcontract to Metropolitan one of the sections included in its tie bid. The court held that such a subcontract is not illegal per se but that a jury could decide whether the subcontract was a product of conspiracy, in which case the arrangement would violate Section 1 of the Sherman Act.

Complimentary Bidding

Complimentary bidding is the practice of submitting artificially high bids with the knowledge that someone else will be the low bidder. The purpose of complimentary bidding is to convince the procurement officials that a job has been competitively bid as required by state procurement regulations. By creating the illusion of competition, the complimentary bidders can ensure that the contract will be awarded to the low bidder chosen by the conspiracy. Conspirators will "even feign disappointment at bid openings when their bids, which they knew to be high, were unsuccessful." (Brief for Appellant United States of America, United States v. Portsmouth Paving Corp., 694 F.2d 312 [4th Cir. 1982]).

Contractors will provide incentives to competitors to submit complimentary bids by offering payoffs, promises of subcontracts, or other return favors. Sometimes a firm will receive complimentary bids in its favor automatically because, for example, it has its asphalt plant closest to the job site. (Ashland-Warren, Inc., 507 F. Supp. at 439 [M.D. Tenn. 1982]). Such a practice would be part of a tacit, or express, agreement that the conspiring firms would maximize profits by giving each job to the firm with the lowest cost for that job. Whatever the benefits the complimentary bidder may receive in return for his bid, the practice is per se violative of the antitrust laws.

Request for a "Safe" Bid

In Brinkley and Sons Construction Co., a contractor was convicted under Section 1 of the Sherman Act simply because he contacted a competitor and requested a "safe" number to bid in order to avoid underbidding that competitor. The contractor was convicted even though he decided not to submit a complimentary bid. The court held that the request for a safe bid communicated to the competitor that he could inflate his bid without worrying that he would not be competitive. The communication of this knowledge was sufficient to constitute bid rigging and was per se violative of Section 1. (1986-1 Trade Cases CCH, at 61, 924).

Monopolistic Acts

Once a firm gains monopoly power in a given market, it can maintain that power through various acts such as predatory pricing, refusals to deal, or price discrimination. The use of such practices is prohibited by Section 2 of the Sherman Act, and attempts to gain such power through vertical and/or horizontal integration is subject to scrutiny under both Section 2 of the Sherman Act and Section 7 of the Clayton Act.

The case of Arther S. Langenderfer, Inc. v. S. E. Johnson Co., 1984-1 Trade Cases (CCH ¶ 65,905 [6th Cir. 1984]) illustrates the application of the statutes to the highway construction industry. Langenderfer was a civil action between rival paving contractors in Ohio. Langenderfer accused Johnson of unlawfully acquiring monopoly power in the northwest Ohio paving market and of wielding that power to exclude competitors from the market.

S. E. Johnson Co. was established in 1929, and by 1956, when founder Sherman Johnson died, had grown to be the largest asphalt paving contractor in northwest Ohio. Johnson's successor, defendant John Kirby, embarked on an ambitious expansion program during which S. E. Johnson's operation grew from two quarries and three hot-mix plants to seven quarries, fourteen hot-mix plants, and three sand pits. The horizontal acquisition eliminated much of the competition in the paving market, and the vertical acquisitions gave Johnson "a captive supply of stone and sand for its asphalt paving jobs. Furthermore, defendants became primary stone suppliers for the remaining asphalt paving competitors who did not own conveniently located quarries." (Id. at 67,864). As the size of the operation grew, so did the firm's profitability.

The crux of Langenderfer's complaint was that Johnson was excluding competition by bidding artificially low until competitors were driven out (better known as "predatory pricing"). Langenderfer claimed that the size of Johnson's company was such that he could afford to sacrifice short-term profits until competition was eliminated, at which time he could raise prices and reap monopoly profits. Langenderfer also claimed that the acquisitions through which S. E. Johnson allegedly gained monopoly power were in violation of the Clayton Act.

Langenderfer presented extensive expert testimony concerning the predatory nature of S. E. Johnson's conduct. After discussing the various economic tests the courts have applied in such cases (see, e.g., Areeda S. Turner, Predatory Pricing and Related Practices under Section 2 of the Sherman Act, 88 Harv. L. Rev. 697 [1975]), the court held that the evidence of predatory pricing was insufficient to constitute a monopolization or attempted monopolization under Section 2 of the Sherman Act.

The Langenderfer case illustrates the complexity of litigation in monopolization cases. The case also shows why predatory pricing may not be common practice. In order for such a scheme to work, two important conditions must hold: (1) the monopolist must be willing to lose money long enough to drive competitors out of the market, and (2) once monopoly power is achieved, the monopolist must be able to charge high enough prices to recoup his losses without attracting new competition. The relevance of monopolization doctrine to the Virginia highway construction industry is difficult to gauge without further study into the actual structure of the market, the costs of entering new markets, and so on.

RECENT BID RIGGING CASES: DETECTING AND PROVING ANTITRUST VIOLATIONS

From 1980 through 1986, the U.S. Department of Justice filed 291 indictments for Section 1 violations by highway construction contractors. (Trade Reg. Rep. [CCH], ¶ 45,070-45,086). Most of the indictments resulted in either guilty or nolo contendere pleas. The indictments were the result of the largest investigation of an industry's anticompetitive behavior in U.S. history and was reportedly instigated by a comment made by a confessed conspirator during a federal investigation of alleged bid rigging at O'Hare Airport in Chicago. (Wash. Post, Aug. 5, 1982, at A1). During an interview with U.S. Department of Transportation investigators, the conspirator noted, "If you think this is bad, you should go to Tennessee." The investigators went to Tennessee and found numerous antitrust violations by highway contractors. This discovery led, in turn, to investigations in several other states.

Whether or not this is an accurate account of the beginning of the investigation, it illustrates the nonscientific manner in which many violations are detected. Once investigators identify a market where collusion is suspected, they will attempt to obtain direct testimony regarding the existence of an illegal agreement among competitors. Participants in conspiracies often provide such testimony pursuant to plea agreements with prosecutors. The key is to induce the first witness to testify. Once the members of the conspiracy are identified through direct testimony, obtaining guilty pleas or convictions is relatively straightforward. The methods of inducing testimony will of course vary according to the facts in each case, but an example of one method used by investigators is to interrogate suspected conspirators before a grand jury until one conspirator is caught in a lie or inconsistency. Once a witness is caught lying before the grand jury, the investigators wield considerable leverage on him.

While many of the cases rely almost entirely on the direct testimony of witnesses, courts also consider circumstantial evidence that an illegal agreement was reached. In fact, in United States v. Finis P. Ernest, Inc., 509 F.2d 1256 (7th Cir. 1975), a conviction under Section 1 was upheld solely on circumstantial evidence. The next section is a review of the types of circumstantial evidence considered relevant by the courts in bid rigging cases.

Types of Circumstantial Evidence

Parallel Behavior Among Competitors

When the firms comprising a particular market recognize their economic interdependence, cartel-like behavior may result, even in the absence of formal agreements to collude. This noncompetitive behavior may arise through a rational assessment of the consequences of pricing decisions taking into account the probable reaction of competitors. (Turner, The Definition of Agreement Under the Sherman Act: Conscious Parallelism, and Refusals to Deal, 75 Harv. L. Rev. 655 [1962]). Such consciously parallel behavior is not illegal by itself, but parallel behavior, whether conscious or not, may be circumstantial evidence of an agreement, especially when viewed in conjunction with additional factors such as identical prices on sealed bids or line items of bids.

The probative value of parallel behavior varies according to the facts of a case, but inference to be drawn from such behavior is relatively weak in oligopolistic markets where competitors are strongly interdependent and have good information about each other's actions. On the other hand, parallel behavior gives rise to a strong inference of agreement when the market is diverse, when the products involved are nonstandard, when labor or overhead is a large component of the project cost, or when similar conditions that would normally lead to price variations among competitors are present. Identical, or very similar, prices on line items of sealed bids are one of the clearest indicators of collusion.

The Relevance of Market Definition

Market definition often plays a key role in antitrust litigation. In order to show that a challenged practice exerts an unreasonable restraint on trade or commerce, it is necessary to define the market where that trade or commerce occurs. In bid rigging cases, market definition can be used as circumstantial evidence of the existence or absence of a conspiracy. However, the value of this circumstantial evidence may be more important to the detection of collusion rather than to the actual litigation of cases. For this reason, the issue is not often addressed in the cases.

The issue of market definition is often raised by defendants in bid rigging cases to show that they were not in competition with their alleged co-conspirators and therefore had no reason to collude with them. (See,

e.g., United States v. Portsmouth Paving Corp., 694 F.2d 312 [4th Cir. 1982]; United States v. Ashland-Warren, Inc., 537 F. Supp. 433 [M.D. Tenn. 1982]). In Portsmouth Paving, the defendant attempted to present testimony by an expert witness regarding the definition of markets in the Tidewater area in Virginia. The expert testimony was intended to show that the defendant's bidding behavior was influenced by economic reality rather than by an agreement among competitors. The thrust of the expert testimony was that the market area of a paving contractor was, in large part, defined by the limited haul distance of hot asphalt. According to the defendant's expert, Portsmouth Paving almost always limited bids to the Portsmouth area because to compete outside Portsmouth, it would need to construct a new asphalt plant. This geographic limitation of bidding was not, they argued, the result of an agreement to allocate markets. The court in Portsmouth Paving refused to allow the testimony of the expert on the grounds that it was cumulative and would possibly be confusing to the jury. The court recognized that market areas were relevant and that the farther a contractor had to travel, the less competitive he would be. However, the court ruled that the argument was a common sense notion and that the jury could understand it without the aid of sophisticated economic analysis.

Market definition plays a less significant role in bid rigging cases than in other antitrust cases because it tends to show only the potential effectiveness of a bid rigging conspiracy. Since bid rigging is per se violative of federal and state antitrust laws, the government need not show that the defendants actually had the means to fix prices effectively, only that they engaged in the conspiracy. (Cf., United States v. Socony-Vacuum Oil Co., Inc., 310 U.S. 150, 224 n. 59 [1940]). Another reason that market definition plays a relatively minor role in the actual litigation of bid rigging cases is that contractors may have an incentive to collude with firms with which they are not in direct competition. In Portsmouth Paving, the court apparently accepted the government's characterization of the "domino effect" that would occur if one market were to become competitive. The result that the bid riggers were trying to prevent, according to the government, was that low prices generated by competition in one region would cause low prices in the adjacent regions until the most remote member of the conspiracy was adversely affected. The court's opinion did not address the defendant's contention that such a domino effect would not occur because the alleged conspirators were not in competition.

An interesting aspect of the market definition arguments put forth by various defendants is the reliance placed on the limited haul distance of hot asphalt. The standard argument is that the expense of setting up new or relocated plants makes it economically infeasible to compete for work outside the firm's immediate area. In Ashland-Warren, a defendant's witness testified that certain types of asphalt plants could be relocated for \$25,000 to \$30,000 (in 1980). However, such an expense would probably not be prohibitive considering the fact that contractors would pay competitors upward of \$80,000 to refrain from bidding. (See, e.g., United States v. Allied Asphalt Paving Co., 451 F. Supp. 804 [1978]). If these figures have any accuracy at all, they indicate that the "limited" market areas for paving contractors may be attributable in part to the existence

of well-developed job and market allocation networks as well as the physical limits on haul distance.

Trade Associations

The main purposes of trade associations are to educate and to exchange information among members of an industry. Trade associations enhance the performance of competitive markets by promoting new and better methods of conducting business. However, trade associations also provide competitors an opportunity to meet and discuss possible collusive activities. Such an exchange of information is generally considered vital to the continued success of a conspiracy (Hay, Oligopoly, Shared Monopoly, and Antitrust Law, 67 Cornell L. Rev. 439 [1982]). In fact, bid rigging cases will often mention the fact that the conspirator attended trade association functions at which the details of the conspiracies were worked out. (See, e.g., United States v. Washita Construction Co., 789 F.2d 809 [10th Cir. 1986]). In Washita, the defendants had attended a cocktail party hosted by the local trade association the night before a bid letting at which negotiations were conducted concerning the allocation of jobs among the conspirators. The negotiations may have included subcontracts, promises not to compete in the future, or any other aspect that needed to be coordinated among the participants in the bid rigging scheme. Once a job was worked out, the designated low bidder would tell the complimentary bidders what figure to bid above.

Trade association membership and attendance at trade association functions is considered relevant circumstantial evidence in bid rigging cases because of the opportunity for communication among conspirators, not because of any inherent tendencies of trade associations. (See, e.g., United States v. Finis P. Ernest, Inc., 509 F.2d 1256 [7th Cir. 1975]).

Case Study--United States v. Finis P. Ernest, Inc.

The case of United States v. Finis P. Ernest is interesting because the convictions of the defendants were upheld solely on circumstantial evidence. Ernest had been the only bidder on a highway construction job advertised by the state of Illinois. The bid was rejected because it was too far above the engineer's estimate. When the project was re-bid, two contractors submitted bids, Ernest and Modern Asphalt Paving and Construction Co. Ernest was awarded the contract as low bidder.

The bids were submitted on a form provided by the state procurement agency. The bid forms required the bidders to provide sixteen line item prices including materials, labor, overhead, profit, and any other costs needed to complete the work. On seven of the line items, Modern and Ernest indicated identical prices. For each of the other line items, Modern indicated prices higher than Ernest's. An examination of these items indicated that Modern had arrived at its prices by making simple changes to Ernest's price. For example, the installed price of piping was changed from \$12.19 to \$13.19 per foot; in other line items, the unit price for another item was rounded up from \$33.42 to \$33.50.

In addition to the pricing similarities, the Court cited other circumstantial evidence of an agreement between Modern and Ernest. This evidence tended to show that Modern had no intention of winning the contract. Modern's bid had been hastily prepared during the morning of the day on which bids were due; no one from Modern had visited the site or contacted suppliers for prices; if Modern had been awarded the contract, its workload and capacity were such that it would have been unable to get a performance bond; also, Modern's checking account had insufficient funds to cover the check Modern submitted with its bid.

The government also showed that Modern and Ernest had ample opportunity to conspire on the bids because the two firms had worked together on another project. The Court held that this fact, along with the circumstantial evidence noted above, was sufficient to uphold the conviction.

REFLECTIONS ON DETERRING COLLUSION

Various methods have been proposed for deterring collusive bidding. Some are intended to reduce the impact of collusion by increasing competition in the particular market or by making it more difficult to coordinate a successful conspiracy. Other suggestions are geared toward improving detection techniques. Since bidding procedures are governed by state law, implementation of some ideas may be difficult. The purpose here is to summarize the various techniques and discuss some of the positive and negative aspects of each.

Improving Competition in the Marketplace

The most obvious way to increase the competitiveness of a sealed bid market is to encourage more firms to bid. State procurement agencies can provide incentives for firms to bid by reviewing prequalification requirements, on-site inspection policies, and other overhead-related items to ensure that the benefits derived from such requirements are not outweighed by the burdens placed on the contractors. Competition can also be increased by carefully matching the work advertised to the capacity of the contractors in the marketplace.

Overhead-related items such as prequalification requirements serve a beneficial purpose because they improve the monitoring capability of state procurement agencies. However, they may deter firms from bidding if the requirements are overly burdensome. The policy of debarment of collusive firms has a similar double-edged effect. The threat of debarment is a strong deterrent for firms that might consider rigging bids. On the other hand, debarment of firms tends to hinder competition by reducing the number of potential bidders. It is not possible to propose general guidelines for setting prequalification and debarment policies that will work in all markets all the time. The policies should be the subject of continuous review by state officials who are intimately familiar with the relevant markets and who are in touch with the contractors and trade associations involved. Detailed recommendations for prequalification

requirements are prescribed in J. P. Welsch and H. F. Furth, Suggestions for the Detection and Prevention of Construction Contract Bid Rigging, Section 2 (February 1983), prepared by the Interdepartmental Bid Rigging Investigators Coordinating Committee of the U.S. Department of Justice and Transportation, and in the Proceedings of the 1981 Annual Meeting of the American Association of State Highway and Transportation Officials, pp 43-45. Many of the recommendations in these references are already in use in Virginia.

Another approach to increasing competition in sealed-bid markets is to gear the work to the existing capacity of the market. For example, it may be advantageous to split the work into relatively small portions, thereby encouraging smaller firms to bid. On the other hand, by dividing the work into several smaller contracts, economy of scale advantages may be lost. Also, it has been argued that clustering projects into very large contracts will induce at least one firm to violate cartel prices and win awards with a competitive bid.

North Carolina has proposed two techniques for clustering projects into large contracts without discouraging the smaller firms from bidding. (General Accounting Office Report, "Actions Being Taken To Deal with Bid Rigging in the Federal Highway Program" [May 23, 1983]). One technique is to cluster several smaller projects into large bid packages. Firms are allowed to choose whether to bid on one project or on the whole package. The system may encourage more firms to bid by allowing them to tailor their bidding choices to their available capacity. A disadvantage may be that large firms will be unsure about which jobs may go to smaller firms and therefore will be unable to take full advantage of all production efficiencies.

The other approach proposed by North Carolina is referred to as "sequential bidding." With this system, the bidder submits on the condition that the total award will not exceed a specified level. The bids on the various projects are opened sequentially. Once a firm's specified limit is reached, its bids are not considered on the remaining projects. Sequential bidding provides incentives for firms to bid on more projects without worrying about taking on more work than they can handle.

In summary, the competitiveness of a sealed-bid market can be improved by increasing the number of bidders. Firms can be encouraged to bid through relaxed requirements on overhead items such as prequalification requirements and by matching the workload to the available capacity. Implementation of these competition-enhancing measures requires judgment on the part of procurement officials and intimate familiarity with the relevant markets.

Hindering Collusive Practices

In an oligopolistic market, i.e., one in which a few firms are dominant, a successful conspiracy must accomplish two tasks: (1) establish a mutual understanding of the price or output level to be used by the conspirators, and (2) promote mutual confidence that the terms of the understanding will be honored by the participants. Standard bidding

procedures often facilitate the accomplishment of the first task by disseminating certain information in connection with the bidding process. The most important piece of information is the list of potential bidders. Bid riggers use this list to identify and contact the other potential bidders in order to ensure that no one will underbid the firm chosen by the conspiracy to get the contract award. (See, e.g., Metropolitan Enterprises, Inc., 728 F. 2d 682). By keeping this list secret until after the bid letting, the state could create uncertainty among the conspirators about whether a newcomer may decide to bid competitively. The effectiveness of keeping the list secret will probably be limited in those markets where the cost of entry is high and the existing firms have long-standing working relationships with each other. Even so, the slight uncertainty may discourage some firms from colluding.

The state engineer's estimate is another useful piece of information for conspirators. If bidders know what the state thinks a job is worth, they have a basis from which to start their job allocation negotiations. The rigged price will then exceed the engineer's estimate but not by so much that the bids will be rejected. If the contractors are unsure of the state's valuation of a project, they will be uncertain about how high to bid, and they could be inclined to bid close to competitive prices.

Another method for hindering the establishment of mutual understanding among conspirators is to have frequent advertisements. Frequent bid lettings force potential conspirators to communicate often to set up jobs, thus raising the cost and complexity of the conspiracy.

The accomplishment of the conspirators' second main task, promoting confidence that the participants will adhere to the terms of the conspiracy, is not difficult in the typical bidding scenario. The conspirators can easily detect competitive bidding because the identity of the bidder and the amount of the bid are announced after the bid letting. Firms will be hesitant to violate the terms of the conspiracy because their actions will be immediately detected, and the competing firms would be able to retaliate effectively by submitting competitive bids on subsequent projects. The renegade firm would win the first contract but would forgo the large profits that would be gained by rigging future projects. The confidence of the conspirators would be significantly undermined if the identity of the low bidder and the quantity of his bid were kept secret. Obviously, keeping the identity of the low bidder secret is not possible. While keeping the quantity of the low bid secret may be desirable, as a practical matter, the low bid must be disclosed to avoid the appearance of impropriety in the contract award process.

Another avenue for creating uncertainty among potential conspirators is occasionally to award projects to randomly selected bidders, rather than to the low bidder. If the bids are clustered very closely, the state could award the contract to someone other than the low bidder without paying an excessively high price. If one bid was much lower than the others, the state would award the contract to that bidder. By keeping the quantities of all bids on the project secret, the conspirators would be unsure whether anyone cheated on their agreement. This uncertainty will provide an incentive for firms to violate the terms of collusive agreements. The main problem with the proposal is that it does not

provide an incentive to bid below the collusive price because, in a random selection process, having a low bid will not ensure a firm's winning the contract. The scheme may, however, deter firms from submitting complimentary bids on projects they are not prepared to complete. If a firm is awarded a contract it is unable to fulfill, it would be forced to subcontract the job to other contractors. In this manner, the conspiracy would become more complex and therefore more expensive and prone to detection.

The use of a random selection process may not be effective unless used on a regular basis. The problem with frequent use of the system is that, in order to work, the bids must be kept secret. This secrecy would likely present the appearance of impropriety and would probably be unacceptable to the contractors and the public.

The well-established practice of requiring bidders to submit affidavits of noncollusion should be continued because it can have an impact on a conspirator's willingness to adhere to the terms of the conspiracy. The affidavit requirements remind the contractors of the seriousness of antitrust violations. Also, by signing a false affidavit, collusive bidders are risking committing a separate offense they may be unwilling to bear.

Detecting Collusion

The best way to "detect" collusion among bidders is to obtain direct testimony from witnesses to the illegal agreement. Since such testimony is generally not available, investigators must be able to draw inferences from the circumstantial evidence that is available. Numerous methods have been proposed for using the available information to detect collusion. Generally, these methods rely on common sense analysis of bidding patterns. (See, e.g., W. A. McFarlane, Antitrust and State Contracting [1982]). Other methods use sophisticated statistical tests to detect collusion (see, e.g., M. D. Maltz and S. M. Pollock, "Analyzing Suspected Collusion Among Bidders," White-Collar Crime: Theory and Research, G. Geis and E. Statland, eds. [1980]). While the proposals vary in sophistication, they all depend on an intimate familiarity with the relevant firms and markets. There is no "automated" collusion-detection system and there is not likely to be.

Procurement officials can improve their understanding of construction markets by gathering information about construction firms and their affiliations. Generally, some information of this nature is obtained through the prequalification process. However, timely updates of this information and detailed assessment of the need for more complete information should be an ongoing process within VDOT.

A sophisticated cost estimating system like that used by VDOT (BAMS) is also indispensable to a thorough analysis of bids. The estimating system must be sufficiently detailed to identify all factors affecting project cost including such variables as transportation costs. A detailed, objective cost estimate will allow bid analysis to identify line item costs in bids that do not reflect rational business decisions on the

part of bidders. In this regard, it is also important that the state continue to require detailed line item bids. By breaking the project costs into easily analyzed cost items, the state will make it more difficult for contractors to submit irregular bids.

Once procurement officials are armed with comprehensive data on the relevant firms and a sophisticated cost estimate, the bids can be analyzed to identify irregular patterns that may indicate collusion. The following list of source documents provides a comprehensive compilation of possible indicators of anticompetitive behavior that VDOT may wish to use as it moves forward in complete implementation of its antitrust monitoring and detection effort:

1. J. P. Welsch and H. F. Furth, Suggestions for the Detection and Prevention of Construction Contract Bid Rigging, Interdepartmental Bid Rigging Investigations Coordinating Committee of the U.S. Department of Justice and Transportation (1983).
2. Report of the Task Force on Estimating Bidding Procedures for Strengthening Bidding and Contract Procedures, AASHTO Proceedings (1981).
3. United States Attorneys' Manual, U.S. Department of Justice (1986).
4. Indicators of Fraud in EPA Procurement, U.S. Environmental Protection Agency (1986).

CONCLUSIONS

The purpose of this paper was to summarize the economic and legal aspects of competitive market behavior, provide a source document for use by the Antitrust Monitoring and Detection Unit of VDOT, and to provide a framework for further empirical study of Virginia's construction industry.

Clearly, both the legal and economic approaches to this subject are closely related, although they differ in focus. The economic inquiry focuses on the causes, effects, and characteristics of markets that exhibit anticompetitive behavior, while the legal system is concerned with deterring such behavior and with providing remedies for those injured by it.

The unifying theme of the two approaches is that the basic doctrines are very general and that problems in the area of antitrust cannot be dealt with effectively without a thorough understanding of the specific markets and firms involved. It is clear that effective collusion detection and encouragement of competition require a thorough understanding of Virginia's construction industry. This goal can be achieved through an empirical study of the markets to identify those where competition may be enhanced and those where it may be at greatest risk.

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