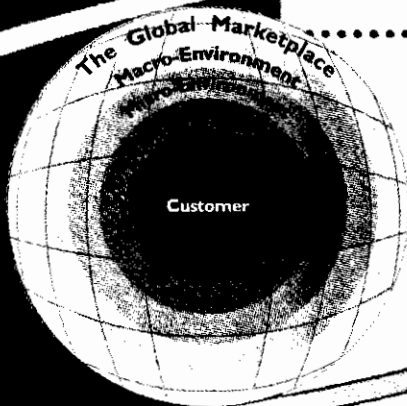


CASE 10

Quality Asphalt, Inc.



This case was prepared by Lynda L. Goulet and Peter G. Goulet of the University of Northern Iowa and Timothy E. Williams, a graduate of the MBA program at the UNI.

Greg Halvansen was alone in the office of Quality Asphalt on the day before Thanksgiving in 1995. His brother, Don, and parents, Mark and Doris, had already left. Greg was thinking about the next day because Thanksgiving was a day when the family would all be together, and traditionally, it had become the day on which the family made many major decisions. In 1971, during the Thanksgiving weekend, Mark decided to leave his position as equipment operator with the State Highway Maintenance Department and start his own asphalt paving business in Williston. He

Funding to support the development of this case was provided by the UNI John Poppajohn Entrepreneurial Center. To preserve the firm's desires for anonymity, the names of the firms and individuals and the geographic location have been disguised. The firm's financial data have been adjusted, although the actual sales growth rates, performance percentages, and key ratios have been preserved. Copyright © 1998 by Lynda L. Goulet, Peter G. Goulet, and Timothy E. Williams.

cashied in a life insurance policy and used the proceeds to purchase a small dump truck and a used asphalt paver. Seven years later, Mark and Doris decided to incorporate their business, which had been operating as a proprietorship. In 1991, both of the Halvansen children were working in the family business. Don was vice president of field operations and responsible for all the firm's construction activity. Greg was vice president of sales. That year, a record year for sales and operating profit, Mark and Doris used the Thanksgiving holiday to announce their decision to gradually retire and to give their shares of stock to their two sons.

Greg stared at the financial statements for the 1995 fiscal year, which ended September 30. Although the statements had arrived 2 weeks earlier, he hadn't had much time to examine them. A period of unusually warm weather was keeping the firm busy. He'd even seen people golfing when he was out earlier in the day delivering a

quote for repaving a supermarket parking lot. Profits for that year were better than he had expected, especially since sales had declined considerably from the previous year. On the other hand, the current year's sales were not much higher than they had been in 1991, and 1995 operating profits were considerably lower than the record year of 1991. (Refer to the summary of the financial statements in Exhibit A.) It was now 4 years since their parents had announced their plans to retire, yet they still retained ownership of all the firm's 126,000 shares of stock, and as the only two members of Quality Asphalt's board of directors, they still made all the major decisions. Greg was concerned because he strongly believed that many important decisions involving Quality Asphalt's long-run future had to be made soon. He really didn't want another Thanksgiving "pow-wow" to go by without everyone sharing a common vision of the firm's future.

COMPANY HISTORY

Until the mid-1980s, Quality Asphalt (QA) operated only as an asphalt paver, purchasing its asphalt mix from Williston Asphalt Company, whose plant manager was a neighbor of Mark and Doris. The only other producer of asphalt mix in QA's immediate market area was Svenson Asphalt and Paving, the largest competitor in the area. When Williston Asphalt Company sold out to Svenson in 1985, QA's cost for its materials rose substantially, resulting in a significant loss. That Thanksgiving Mark and Doris made their decision to produce their own asphalt mix. During the winter off-season the Halvensens purchased a used asphalt plant and a one-acre tract of undeveloped land in Williston's new industrial park. By the following spring, QA had hired an asphalt plant manager and was producing its own asphalt mix. This decision subsequently led to a period of growth and profitability. During the remainder of the 1980s, net income rebounded and reached a high of \$81,000 in 1989 on sales of over \$2 million, about three times QA's 1985 sales level. By 1991, sales reached nearly \$2.5 million, and net income was a record \$166,000.

Don began working for the family business in the first year of its operation as a laborer during the summer while he was enrolled in a local liberal arts college. After graduating, he joined QA on a

full-time basis and soon became supervisor of the firm's labor crew. When QA began producing its own asphalt in 1986, sales began to grow by leaps and bounds, and by 1989, QA had four labor crews, each with its own field supervisor, each managed by Don. In the fall of 1988, at his father's request, Greg quit his job and moved back to Williston, assuming full responsibility for QA's sales activities. Greg had studied construction engineering at a well-known state university and then accepted a position in that state's department of transportation (DOT). After 12 years of working for the DOT, Greg had moved into the private sector, working for 5 years for a civil engineering consulting firm before joining the family business at the start of QA's 1989 fiscal year.

During the late 1980s and early 1990s, QA hired three other nonconstruction employees. Greg hired Steve Lorens as his sales assistant shortly after arriving at QA. Steve had just graduated as a marketing major from the state university. Steve was hired to focus on acquiring jobs in the sizable market for small residential customers. That way Greg and Mark could concentrate on sales work associated with larger projects. In 1987 QA's accountant suggested to Doris that she offer an internship to a business management major at the nearby college to help her with the increasing tasks and paperwork resulting from QA's growth. After completing his internship at QA in the summer of 1987 and graduating in August, John Richards was hired as office manager at the beginning of QA's 1988 fiscal year. In 1990, working with Greg and Steve, John computerized QA's accounting and record-keeping systems. Janice Jeffries, a community college graduate, was hired in 1991 when John Richards had personal problems that necessitated his taking almost an entire year's leave of absence. After John's return in 1992 and Mark and Doris' announcement of their retirement decision, Janice agreed to continue working for QA full time for the 8-month construction season and 1 week during each of the remaining months.

In 1992, after learning about the Halvensen's decision to gradually retire, Svenson Asphalt and Paving made an offer to buy Quality Asphalt, which Mark and Doris refused. Svenson then began a price and bidding war that continued for more than a year and caused in decline in QA's profitability in both 1992 and 1993. Svenson's attack on QA ended in late 1993 when Svenson was purchased

EXHIBIT A
Quality Asphalt Financial Statements (Years Ending September 30)

(\$ in thousands)

	1995	1994	1993	1992	1991	1990	1989	1988	1987
Gross revenue	\$2,580	\$3,245	\$2,433	\$2,222	\$2,444	\$2,407	\$2,180	\$1,714	\$1,037
Cost of construction									
Materials	\$ 752	\$1,026	\$ 777	\$ 554	\$ 619	\$ 766	\$ 646	\$ 555	\$ 321
Labor	619	637	594	528	440	489	440	285	190
Subcontractors	117	501	258	312	426	388	295	275	66
Depreciation	176	113	115	117	111	91	80	68	55
Other expenses	325	401	351	308	266	276	292	212	145
Total COC	\$1,989	\$2,678	\$2,095	\$1,819	\$1,862	\$2,010	\$1,753	\$1,395	\$ 777
Gross profit	\$ 591	\$ 567	\$ 338	\$ 403	\$ 582	\$ 397	\$ 427	\$ 319	\$ 260
General & administrative									
Salaries	\$ 86	\$ 85	\$ 83	\$ 80	\$ 62	\$ 66	\$ 64	\$ 36	\$ 17
Insurance	113	87	85	83	79	67	62	57	43
Interest	44	26	21	26	34	25	40	45	50
Other G&A expenses	183	202	135	145	139	162	148	95	66
Total G&A	\$ 426	\$ 400	\$ 324	\$ 334	\$ 314	\$ 320	\$ 314	\$ 233	\$ 176
Earnings before taxes	\$ 165	\$ 167	\$ 14	\$ 69	\$ 268	\$ 77	\$ 113	\$ 86	\$ 84
Income taxes	55	56	2	14	102	17	32	20	19
Net income*	\$ 110	\$ 111	\$ 12	\$ 55	\$ 166	\$ 60	\$ 81	\$ 66	\$ 65
Accounts receivable	\$ 620	\$ 675	\$ 898	\$ 363	\$ 902	\$ 359	\$ 780	\$ 575	\$ 282
Inventory	44	25	35	25	18	20	9	9	17
Cash + other current assets	141	25	246	166	132	286	146	132	102
Total current assets	\$ 805	\$ 725	\$1,179	\$ 554	\$1,052	\$ 665	\$ 935	\$ 716	\$ 401
Net property and equipment	995	777	789	797	764	637	598	546	413
Total assets	\$1,800	\$1,502	\$1,968	\$1,351	\$1,816	\$1,302	\$1,533	\$1,262	\$ 814
Current liabilities	\$ 500	\$ 451	\$1,068	\$ 421	\$ 878	\$ 600	\$ 782	\$ 553	\$ 130
Long-term liabilities	339	200	160	202	265	195	304	343	384
Total liabilities	\$ 839	\$ 651	\$1,228	\$ 623	\$1,143	\$ 795	\$1,086	\$ 896	\$ 514
Stockholders' equity*	961	851	740	728	673	507	447	366	300
Total liabilities + equity	\$1,800	\$1,502	\$1,968	\$1,351	\$1,816	\$1,302	\$1,533	\$1,262	\$ 814

*All earnings have been retained.

by Packer Paving, the state's largest paving contractor with subsidiaries located throughout the state. Prior to its purchase of Svenson, Packer Paving had purchased controlled interest in Barnes Stone, a rock quarry in the Williston area and a major supplier to QA.

Don and Greg Halverson were both married. Although their spouses were employed, neither of their careers were connected with construction or QA. However, Don's only son, David, was 21 and had been working at QA since he was 16. In 1995 David was one of QA's equipment operators and was likely to be promoted to field superintendent when a position opening became available. Greg's oldest child was expected to begin working at QA as a field laborer in the summer of 1996 after turning 16.

ASPHALT AND CONCRETE PAVING

Asphalt cement is a very heavy by-product of the oil refining process that is nearly solid at room temperature. The cost of asphalt cement is therefore closely related to the price of crude oil and the cost of the refining process. To produce a paving mix, asphalt cement must be heated to temperatures in excess of 300°F before it can be combined with rock aggregate that has been completely dried and heated to the same temperature. Different applications require the asphalt mix to be made from different sizes of rock and different concentrations of asphalt cement.

In order to attain the proper compaction and surface appearance, the asphalt must be laid when the mix is at a temperature exceeding 250°F. This temperature requirement limits the amount of time available to transport the asphalt from the production site to the paving site. The transit time is less than 90 minutes during favorable summer weather conditions and less than 60 minutes during the spring and fall. Projects that require additional finishing effort, such as paving irregularly shaped areas or around obstructions, further reduce the time available for transit and hence the distance from the asphalt production plant. Asphalt that cools below 250°F is considered to be waste. However, if the asphalt temperature is maintained in a heated storage facility, it can be stored for as long as 24 hours. If placed in an insulated (but not heated) storage facility, the neces-

sary temperature can be maintained for 8 hours in hot weather and for several hours in cold weather.

The main substitute for asphalt paving is Portland cement concrete paving, although for some purposes, such as for the shoulders on some roads and for driveways in more rural areas, gravel can be used instead of paving. Concrete paving is a mixture of water, sand, rock, and a cementing agent. Portland cement is produced by superheating lime powder. Once Portland cement is mixed with water, it binds to whatever it contacts (such as sand and rock) and begins to cure (harden). The porous quality of the rock aggregate used to make concrete is a major concern. Rock that is too porous will not cure well and will not be as durable. Because highly porous rock will absorb and retain water, the expansion and contraction when water freezes and ice melts will cause the concrete paving to crack more easily than it would if less porous rock were used. Like asphalt, concrete has a limited life before it can no longer be used for paving. Evaporation during transport to the paving site and excess heat create the time limitation for concrete. Since evaporation is greatest when outdoor temperatures are high, concrete can be transported further distances in cooler weather. An "extender" also can be added to the concrete paving mix to help reduce the evaporation rate. Thus, while concrete generally can be transported further distances than asphalt can, concrete cannot be stored once the cement is mixed with water because the curing process cannot be arrested indefinitely.

The determination of whether to use asphalt or concrete pavement is made by the project developer, usually on the advice of engineers involved in the project design. The decision typically is based on several criteria, including soil conditions, expected traffic loads, past experience with paving alternatives, knowledge of the paving methods, personal preference, and cost. Roads can be paved with either concrete or asphalt, although an asphalt surface must be thicker than a concrete surface to bear the same weight. For most heavy-duty applications, such as roads, a rock underlayment is used for both asphalt and concrete paving. This rock base allows water to drain into a tiling system under the shoulders of the road. High-traffic roads paved with concrete require stress-reducing reinforcements, usually made of steel, to be laid between lanes and every 20 feet within lanes. Such

"joints" in the concrete paving help to reduce the random cracking of the pavement from weather and traffic-related heaving by channeling any cracking tendency to the joints. Such reinforcement is not required for roads paved with asphalt. Concrete surfaces can be repaved with another layer of concrete or a layer of asphalt, and asphalt surfaces can be repaved with more asphalt or with a layer of concrete. Furthermore, both old concrete and asphalt roads can be "recycled" with pavement-eating machines that grind up the old surface into small pieces that can then be used as underlayment for the new pavement.

QUALITY ASPHALT'S ENVIRONMENT

National Economic Conditions

The general economy in the United States at the end of 1995 was characterized by increasing personal income, low unemployment, low inflation, relatively low interest rates, and a very strong stock market. In 1995, the national unemployment rate was 5.3 percent, down from its most recent high of 7.5 percent in 1992. Growth in consumer prices for 1995, as measured by the CPI, was 2.8 percent for all items, well below the 5.4 percent rate in 1990. Inflation in producer prices (PPI) for paving mixtures was 2.5 percent for 1995, and prices were still well below the average price from 1985. The prime interest rate charged by banks averaged 8.8 percent, up from a low of 6.0 percent in 1993 but below the 10.9 percent rate from 1989.

Construction activity in the United States was reasonably strong in 1995. Low vacancy rates encouraged the construction of additional office space. Vacancy rates for office buildings during 1995 averaged 14.3 percent, down from a high of 20.5 percent in 1992. Since 1991, the value of new construction increased in both the private and public sectors following the short recession in 1990-1991. Although consumer spending for improvements, maintenance, and repairs of residential property also increased following the recession, a slight decline occurred in 1995. Since 1993, construction employment and average hourly earnings were rising, as was the average performance of firms in the industry. (See Exhibit B for data concerning U.S. demographic information and construction activity.)

The economy was expected to remain strong, although there was some concern about inflation. Many stock market experts expected Federal Reserve Chairman Greenspan to slowly continue to raise interest rates in an effort to control inflation. Such increased interest rates would be expected to somewhat depress construction activity in both the residential and business customer segments. However, demographic trends indicated support for continued strength in construction activity for at least the next decade. The percentage of the U.S. population aged 35 to 64 was expected to continue to increase. These age groups earn more and spend more on housing than other age groups.

By 1995, construction of the Federal Interstate Highway System was essentially completed. The system, developed by President Dwight Eisenhower in the 1950s, improved our national defense system by providing a means to quickly and efficiently transport military equipment and personnel from one area of the country to another. This highway system also proved to be a large factor in the economic success of the nation. The construction and maintenance of federal and state highways had been funded in large part from fuel and road-use taxes. As of 1993, over two-thirds of the nation's highway pavement was considered to be in at least fair condition, with the major exception of interstate highways in urban areas, as shown below.

Rating	Total Interstate	Total Interstate
Poor	9%	12%
Mediocre	15%	28%
Fair	38%	24%
Good	20%	26%
Very good	18%	9%

Rating	Total Interstate	Total Interstate
Poor	9%	12%
Mediocre	15%	28%
Fair	38%	24%
Good	20%	26%
Very good	18%	9%

Source: *Statistical Abstract of the United States, 1993.*

Local Economic Conditions

Quality Asphalt, Inc., was located in Williston, which had a metropolitan area population of 178,000 in 1995. Williston was located about 60 miles from the city of Hartford with an area population of 118,000 and about 30 miles from New Brighton with an area population of 64,000. (Refer

EXHIBIT B
United States Demographic and Construction Activity Information

	1980	1985	1990	1995	2000 est.
Total population	227,726,000	238,466,000	249,913,000	263,034,000	274,634,000
Personal income per capita	\$10,087	\$14,421	\$19,170	\$23,193	NA
No. of households	80,776,000	86,789,000	93,347,000	98,990,000	103,246,000
Percent of population by age group					
24 and younger	41.4%	38.6%	36.5%	35.7%	35.3%
25-34	16.4%	17.5%	17.4%	15.6%	13.6%
35-44	11.3%	13.3%	15.1%	16.2%	16.3%
45-54	10.0%	9.4%	10.0%	11.8%	13.5%
55-64	9.6%	9.3%	8.5%	8.0%	8.7%
65 and older	11.3%	11.9%	12.5%	12.7%	12.6%

Value of New Construction (\$ in millions)

Year	Total	Private	Public	Per Capita Total
1985	\$ 377,358	\$ 229,543	\$ 77,815	\$ 1,582
1986	\$ 407,682	\$ 323,100	\$ 84,582	\$ 1,694
1987	\$ 419,386	\$ 328,738	\$ 90,648	\$ 1,727
1988	\$ 432,251	\$ 337,516	\$ 94,735	\$ 1,764
1989	\$ 443,651	\$ 345,477	\$ 98,174	\$ 1,794
1990	\$ 442,161	\$ 334,683	\$ 107,478	\$ 1,769
1991	\$ 403,404	\$ 293,295	\$ 110,109	\$ 1,597
1992	\$ 435,021	\$ 315,696	\$ 119,326	\$ 1,703
1993	\$ 464,501	\$ 339,160	\$ 125,341	\$ 1,799
1994	\$ 506,904	\$ 376,566	\$ 130,338	\$ 1,945
1995	\$ 526,598	\$ 383,886	\$ 142,711	\$ 1,991

All Government Expenditures for Highways (\$ in millions)

Year	Total	Federal	State	Local	Per Capita Total
1985	\$ 45,856	\$ 834	\$ 27,167	\$ 17,854	\$ 192
1990	\$ 61,913	\$ 856	\$ 36,464	\$ 24,593	\$ 248
1991	\$ 65,601	\$ 665	\$ 38,911	\$ 26,025	\$ 260
1992	\$ 67,196	\$ 813	\$ 40,266	\$ 26,117	\$ 263
1993	\$ 68,753	\$ 619	\$ 42,056	\$ 26,078	\$ 266
1994	\$ 72,758	\$ 691	\$ 43,812	\$ 28,255	\$ 280

**Expenditures by Residential Property Owners for Improvements, Maintenance, and Repairs
and Number of New Privately Owned Housing Unit Starts**
(\$ in millions)

Year	Residential Spending	Housing Unit Starts	Per Capita Residential Spending
1985	\$ 80,267	1,742,000	\$ 337
1986	\$ 91,274	1,805,000	\$ 379
1987	\$ 94,082	1,620,000	\$ 387
1988	\$ 101,117	1,488,000	\$ 413
1989	\$ 100,891	1,376,000	\$ 410
1990	\$ 106,773	1,193,000	\$ 427
1991	\$ 97,528	1,014,000	\$ 386
1992	\$ 103,734	1,200,000	\$ 411
1993	\$ 108,305	1,288,000	\$ 420
1994	\$ 115,030	1,457,000	\$ 441
1995	\$ 111,683	1,354,000	\$ 425

**Construction Industry Corporations with Activity
Selected Measure of Performance for Selected Years**

	1985	1990	1991	1992	1993	1994
No. of active corporations	318,000	407,000	417,000	408,000	417,000	433,000
Average assets	\$ 667,000	\$ 599,000	\$ 582,700	\$ 566,400	\$ 576,500	\$ 575,300
Average liabilities	\$ 505,000	\$ 442,300	\$ 413,400	\$ 390,300	\$ 394,700	\$ 394,700
Percent debt to assets	75.7%	73.8%	70.9%	68.9%	68.5%	68.6%
Average sales	\$1,217,600	\$1,313,800	\$1,235,300	\$1,224,000	\$1,290,900	\$1,369,100
Average net income	\$ 13,835	\$ 16,710	\$ 14,630	\$ 13,480	\$ 17,990	\$ 26,790
Percent net income to sales	1.1%	1.3%	1.2%	1.1%	1.4%	2.0%
Percent net income to assets	2.1%	2.8%	2.5%	2.4%	3.1%	4.7%

Average Hourly Earnings of Construction Workers

Year	Hourly Earnings	Year	Hourly Earnings
1985	\$12.33	1985	\$12.33
1990	\$13.78	1993	\$14.35
1991	\$14.02	1994	\$14.69
1992	\$14.11	1995	\$15.08

*Highway spending for other years not available.

Source: U.S. Statistical Abstract, 1995.

to Exhibit C for a map of the area and Exhibit D for demographic information and construction activity in the Williston metropolitan area.) In 1995, the average personal income level in Williston was almost identical to the U.S. average income.

However, Williston's age group proportions were slightly different from the national percentages. Williston had a slightly higher percentage of its population in the 25 to 34 age group, although this percentage had been declining, but a lower percentage of its population in the 35 to 64 age groups, although the 45 to 54 age group percentage had been increasing. The Williston area's economy was a reasonably well-balanced mix of service businesses and manufacturing firms. New Brighton was primarily a service-based community, while Hartford was primarily an industrial center. The rural areas surrounding all three of these cities were almost entirely devoted to agriculture.

Although Smithtown and Mt. Pias were more than a 90-minute drive from Williston, QA had completed paving projects in the Smithtown-Mt. Pias area in the past. Smithtown, 80 miles from Williston, was a rural community with 13,000 residents. Mt. Pias, 20 miles further, had a population of 29,000. Within a 30-minute drive to the south and west of these two communities were six other towns. Including Smithtown and Mt. Pias, this area of the state had a total population of 94,000 in 1995.

The most obvious indication of the health of the local construction industry was the increase in building permits over the last decade, with very notable increases in 1987 and 1994. Although the number of building permits issued declined in 1995, the average valuation increased. The statistic causing concern for most construction contractors was the low unemployment level in Williston, 2.9 percent in 1995, which was well below both the national unemployment rate of 5.3 percent and the state unemployment rate of 3.3 percent. The unemployment rate in New Brighton, the closest city from which firms could attract labor, was 2.7 percent. At these low levels of unemployment, it is very difficult for a small company to recruit skilled employees. Paving firms face above-average difficulties in attracting and retaining a labor force because of the physical intensity of the work in the summer heat and the seasonability of the business. Weather conditions in QA's area restrict outdoor construction activities to 8 months each year (ap-

proximately 34 weeks), with the off-season from around Thanksgiving to the beginning of April. During the construction season, paving crews worked whenever the ground was dry, the temperature was above freezing, and there was no frost in the ground.

THE NATURE OF CONSTRUCTION CONTRACTING

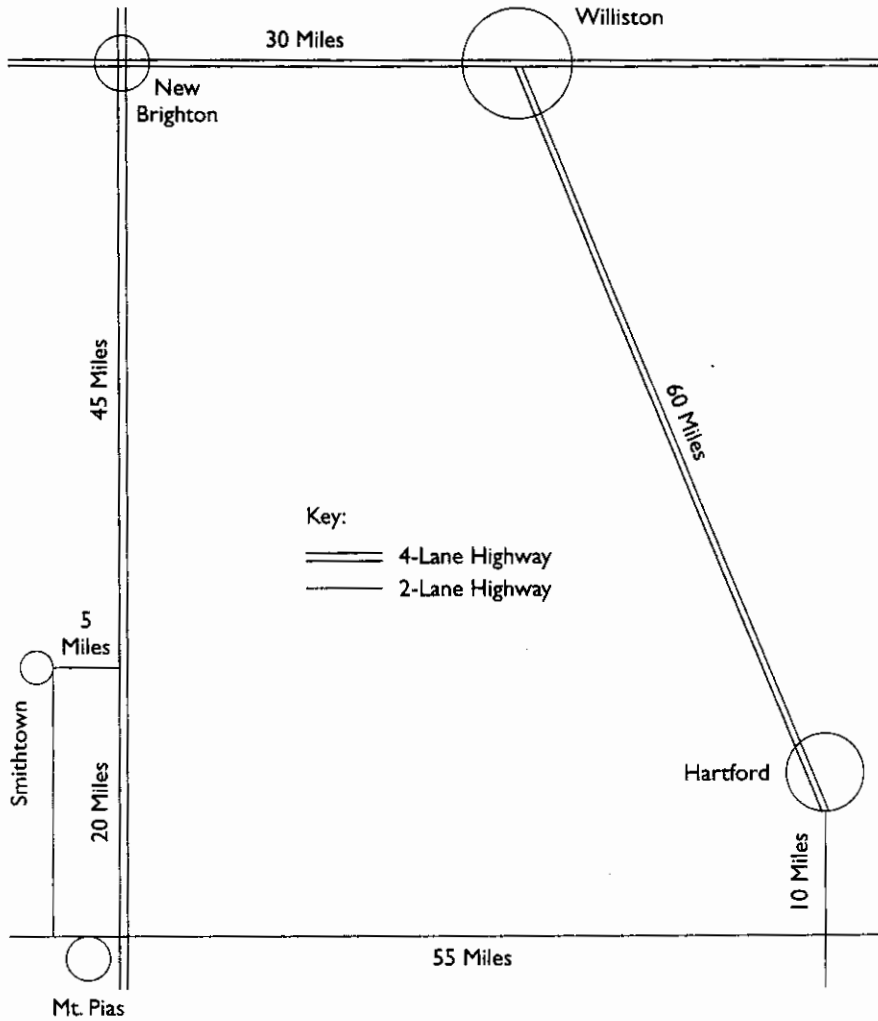
The customers for construction paving work may be classified into three broad categories: residential owners, commercial and industrial organizations, and governments. Residential owners generally require the paving of driveways and private sidewalks. Businesses purchase parking lot and related paving work either as part of a larger building construction project or as an improvement project. Governments purchase highway and street paving, as well as parking lots and public sidewalks, often in conjunction with public building projects or sewer and other public-utility construction work.

All larger construction projects are designed by architects and/or engineers who identify the construction requirements and material specifications appropriate for the project's purpose and the preferences of the owner or governmental entity. Bids are then sought for its construction, either for the project as a whole or for major portions of the work. On publicly funded construction projects, the construction contract(s) typically must be publicly advertised and the contract(s) awarded to the lowest qualified bidder(s). When a contract is for an entire project, the construction firm that "wins" the contract is referred to as the *prime contractor*. Working directly with only one company makes the entire construction process less complicated for the owner or governmental unit. Furthermore, for privately funded projects, keeping the owner's contractual obligations simplified also makes it easier for the owner to obtain external financing.

In contrast to publicly funded construction projects, contracts for privately funded work may be either competitively bid or simply negotiated between a contractor and the owner. When bids are used, the owner is not required to select the contractor with the lowest bid but may use other considerations in awarding the contract. Negotiated contracts usually result from the owner's previous satisfactory experience with the contractor.

EXHIBIT C

Area Map with Distance and Population Information



City/Metropolitan Area	1995 Population
Williston	178,000
Hartford	118,000
New Brighton	64,000
Mt. Pias	29,000
Smithtown	13,000

EXHIBIT D

Williston Metropolitan Area Demographic and Construction Activity Information

	1980	1985	1990	1995	2000 est.
Total population	170,000	165,000	170,000	178,000	186,000
Personal income per capita	\$10,700	\$14,200	\$18,900	\$23,200	\$28,900
No. of households	62,000	61,000	66,000	70,000	73,000
Percent of population by age group					
24 and younger	42.6%	39.0%	36.2%	35.1%	
25-34	17.6%	17.9%	17.2%	15.1%	
35-44	11.6%	13.7%	15.5%	16.6%	
45-54	9.6%	9.4%	10.6%	12.4%	
55-64	8.5%	8.8%	8.4%	8.1%	
65 and older	10.1%	11.2%	12.1%	12.7%	

Year	No. of Building Permits*	Total Valuation	Average Valuation	No. of Residential Permits†
1985	2,946	\$ 37,383,448	\$ 12,690	134
1986	3,091	\$ 37,462,635	\$ 12,120	217
1987	4,405	\$ 54,012,288	\$ 12,260	351
1988	4,898	\$ 68,970,036	\$ 14,080	381
1989	5,058	\$ 90,823,066	\$ 17,955	442
1990	5,144	\$ 74,080,889	\$ 14,400	395
1991	5,511	\$ 88,819,016	\$ 16,115	404
1992	6,123	\$ 94,063,486	\$ 15,360	566
1993	6,387	\$ 86,385,723	\$ 13,525	577
1994	8,347	\$126,915,514	\$ 15,205	631
1995	7,338	\$157,333,043	\$ 21,440	525

*Includes industrial, commercial, and residential building permits for new building and improvements.

†Includes single-family and multifamily dwellings.

Source: Chamber of Commerce.

Negotiated contracts, in the absence of competition, allow the contractor to charge a small premium compared with a competitively bid project. However, few contractors greatly overcharge the owner on a negotiated project because doing so would most likely encourage the owner to use competitive bids on future projects.

Construction work historically has been classified by the government into three major categories: general building contractors, heavy construction, and specialized trades. Heavy construction is further divided into road construction (including paving) and other heavy construction such as elevated highways, sewer construction, tunnels, and bridges. Special trades are also subdivided into numerous types of construction specialties, including such work as electrical, plumbing, heating, excavation, demolition, painting, carpentry, roofing, and concrete and asphalt work other than road paving.

Major projects such as buildings and highways require many types of specialized construction work. Most larger construction firms have the capability of performing a variety of construction tasks associated with either building construction or heavy construction. Such firms are considered to be *general contractors*. In contrast, smaller firms tend to be more specialized, with their services limited to one or a few trades. Because of the complexity and variety of work in large construction projects, most prime contractors are general contractors. However, even general contractors will require the services of specialty firms to complete some parts of the project work (outsourcing). When other construction firms are hired by a prime contractor, such firms are called *subcontractors*. In most states, subcontractors have no formal nor legal relationship with the project owner or governmental unit. Their relationship is strictly with the prime contractor, and they are paid by the prime contractor. The work that subcontractors perform, however, must meet the same requirements specified in the prime contractor's contract. The prime contractor is responsible for the quality and timeliness of all work completed on the project, including the work of subcontractors. It is in the prime contractor's best interest to select the lowest-priced subcontractor for specialty work. However, the prime contractor must balance this cost issue against the need to select subcontractors who are competent and reliable to ensure that the

work will be completed on time and meet the required specifications.

Most construction contracts contain provisions that allow the owner or governmental unit to withhold a percentage (usually 5 percent) of the prime contractor's progress payments in the form of a *retainage*. The retainage provides an incentive for the prime contractor to complete the remainder of the project in a timely fashion. This retainage is released to the prime contractor when the entire project has been completed to the owner's satisfaction. Prime contractors typically withhold the same retainage from their monthly progress payments to their subcontractors.

For publicly funded construction projects, bidders are required to provide *bid security* in the form of a bond or cashiers' check along with the bid. This security (usually 5 to 10 percent of the bid amount) provides assurance that if the bidder is awarded the contract, the bidding firm will enter into a contract for completion of the project at the bid price. If the bidder does not sign the contract, the firm loses its bid security. This money is then effectively used by the governmental unit to offset the higher bid of another firm. Once the contract is signed, the prime contractor is also required to provide a performance bond for the amount of the contract. This performance bond ensures the timely, quality completion of the project under the terms specified in the contract. If the prime contractor fails to complete a project within the stated time frame, the governmental unit may (if state law permits) withhold funds from the contractor's final payment as compensation for any financial losses incurred due to the delay. If the prime contractor should become bankrupt before the project is completed, the performance bond is used to hire another contractor to complete the work. In addition to retainage, bid security, and performance bonds, many projects require the prime contractor to provide a maintenance bond on the project's completion. The maintenance bond provides a guarantee that the contractor will correct any defects in the work during the specified warranty period. Should the contractor fail to repair defects that result from defective materials or workmanship within the warranty period, the owner or governmental unit will cash the maintenance bond and use the money to hire another contractor to complete the needed work.

In order for QA to obtain bonding, Mark and Doris Halvensen had to consent to a lien being placed on their personal home by the bonding agent. This lien provides collateral to the bonding company in the event QA fails to satisfactorily complete its construction contract commitments. If Mark and Doris were to transfer their ownership to their sons, this collateral requirement would apply to both Don and Greg.

Many publicly funded projects place additional constraints on bidders, including minimum wage scales, Disadvantaged Business Enterprise (DBE) and/or Minority Business Enterprise (MBE) participation, and resident employee requirements. Minimum wage scales, typically required on federally funded projects, define the minimum hourly wage that must be paid to employees working on the project, regardless of union affiliation. Minimum DBE and MBE participation is intended to enhance the competitiveness of qualified firms by requiring that a specified percentage of the contract work be subcontracted to such firms, if such firms are available to do the work. Resident employee requirements are intended to ensure that a specified portion of the public funds spent on the construction project remains in the local community in which the work is being done in the form of wages to local employees.

Construction timing is just as critical to the contractor as it is to the owner or governmental unit. Contractors rarely will fail to bid on a project that is within their capability. This means that a firm may submit bids on more projects than it could actually complete in a timely manner. Being too successful in bidding can become a contractor's worst nightmare (called the *winner's curse*). Contractors must be extremely competent in planning work activity when involved in multiple projects. Furthermore, luck also can affect project completion of outdoor work, since weather delays are common. One potential solution to time constraints is to use subcontractors to complete tasks, although the subcontractors may not be available when needed. Another alternative is to use overtime (work exceeding 40 hours per week requires overtime wages be paid at one-and-a-half times the normal wage rate), including work on weekends, although this alternative also may be limited by weather conditions. Both alternatives will reduce the contractor's profitability and must be compared with the penalty assessed for not meeting re-

quired deadlines. Because of the possibility of being overloaded if the firm wins too many contracts, many firms will *overbid* (submit a higher bid than necessary) on some contracts. Then, if the firm wins the contract, the bid price already contains some margin for error.

The state of Wisconsin recently initiated a pilot *design-build construction system* that is being monitored very closely by many other states. Under the program, the Wisconsin State Highway Department establishes results-oriented parameters for construction of a road. An example would be to design a road for 5000 trucks per day with a life expectancy of 15 years before any maintenance is required. The state accepts bids from contractors for the complete design of all details of the project including the methods to be used and materials needed, its construction, and any needed maintenance (in the form of a maintenance bond) of the road for the life of the contract warranty period. To date, Wisconsin has completed at least two of these projects and has several more under consideration. Wisconsin believes that this process will save the state money, as well as expedite the process of designing and constructing the state's road system. Many contractors are concerned that if this design-build system receives wider adoption, it will lessen the competition for all governmental road projects. Small companies will be unable to hire the design and engineering staff necessary to bid for such work and also will be at a disadvantage in obtaining bonding for a project with a higher level of risk to the contractor.

QUALITY ASPHALT'S COMPETITORS, CUSTOMERS, AND GEOGRAPHIC SCOPE

QA's 1995 dollar sales were divided among its customer groups in the following proportions: residential, 15 percent; small commercial, 25 percent; large commercial, 30 percent; and governmental, 30 percent. Although the percentages in each category varied somewhat from year to year, 1995 was a reasonably representative year. On residential and small commercial paving projects in the Williston area, QA competed with Clark Blacktop, Bilton Paving, and Acer Paving. Each of these three firms employed fewer than 10 people. Because these smaller firms focused on small private paving

work, they did not compete head-to-head with Svenson, whose focus was on road paving and large commercial and industrial work. However, in late 1995, a large excavation contractor purchased 50 percent interest in Bilton Paving. Greg was sure that this substantial influx of cash would likely be used to improve Bilton's equipment and expand the scope of its business activity. He also suspected one of the other two smaller asphalt paving companies of occasionally skimping on the thickness of the rock base and asphalt pavement used for driveways in order to cut costs. If true, this practice could have an adverse effect on the residential and small commercial asphalt paving business in Williston, since low-quality pavement has a poor appearance and does not wear well. Dissatisfied customers might attribute their problems to the nature of asphalt rather than to the paver.

Approximately 85 percent of QA's 1995 sales derived from paving projects within 40 miles of its plant site. Paving work in New Brighton accounted for 10 percent of this amount. (Refer to the map in Exhibit C.) During the 1992-1993 period when Svenson pressured QA with its low bidding practices, QA was forced to seek more work outside its traditional geographic area. During this time, QA completed two projects in the Mt. Pias area. However, both projects barely broke even because of the distance from QA's asphalt plant. QA incurred higher expenses from transporting its work crews and equipment over 90 miles to the project site and from having to purchase its asphalt mix from Capital Asphalt and Concrete, a Mt. Pias company. In another attempt to gain additional business in 1993, QA actually had moved its asphalt plant 70 miles west of New Brighton in order to supply asphalt to another paving contractor. The cost required to move its asphalt plant was more expensive than QA anticipated, again resulting in a venture that barely broke even. Material problems and labor overtime from such distant work sites contributed to QA's very poor financial performance in 1993.

Although QA recently completed a parking lot paving project for a restaurant in Hartford, QA has not had much success in obtaining contracts for publicly funded projects in Hartford, primarily for two reasons. Hartford enacted a city code requiring 15 percent local labor participation for all city construction projects. During the 1990s, Packer Paving acquired controlling interest in Hopkins & Com-

pany, the only firm in Hartford that produced asphalt and the dominant firm in Hartford (just as Svenson, also owned by Packer Paving, was the dominant firm in New Brighton).

Greg and his sales assistant, Steve Lorens, performed all of QA's sales and bidding activities, as well as arranging for the acquisition of construction materials and any needed subcontractors. Steve Lorens' focus was entirely on the residential and small commercial customer markets, while Greg's efforts were directed toward large-project commercial and industrial sales and bidding on publicly funded projects. About 85 percent of the bids prepared were for residential and small commercial customer projects, which accounted for 60 percent of QA's total contracts and 40 percent of QA's sales.

QA's advertising and promotion have been directed toward the residential and smaller commercial customer groups. The advertising has consisted of large, strategically located ads in all area telephone directories. Additional promotion efforts have included the sponsorship of selected local civic activities such as community fund raisers, church events, and donations to the local softball league. The firm's logo appears on all the firm's equipment and vehicles. Greg and Steve believe the advertising and promotion activities have proven to be very effective. Many of the firm's residential and smaller commercial customers indicated that they called QA because of the size and text of QA's advertisement in the yellow pages. Steve has been responsible for writing the text and arranging for placement of the telephone directory advertising each year.

Since 1989 when he was hired, Steve has been kept busy responding to residential and small commercial customer telephone inquiries. Steve used a personal selling approach for these customers. Not only were site inspections needed to produce estimates of the materials, equipment, and labor needed for the potential project, but they were useful in promoting goodwill for the firm and for asphalt paving in general. Very few of these customers understood the nature of paving work. Since cost estimates were made on the spot, the price the customer would have to pay was provided immediately. John then spent time with the prospective customer explaining how the work would be done and how long the customer would be inconvenienced while the driveway parking lot was being paved and also answered

any questions the potential customer had. Since there was usually some "sticker shock," Steve explained how the cost would likely compare with concrete paving and how asphalt pavement compared in terms of its appearance and durability.

All prices for proposed work were submitted to residential and commercial customers on proposal forms that also included the firm's payment terms. QA offered payment terms of a 2 percent discount if the bill was paid within 10 days of completion of the work. The entire payment was due within 30 days of completion. If not paid within the 30 days, a service fee of 1.75 percent per month (21 percent per year) was charged. In addition to the service fee, all proposals stated that the customer would be required to reimburse the firm for any legal fees involved in the collection of past due accounts. At the end of the fiscal year, QA used an attorney to assist in the collection of delinquent accounts. Most customers settled their accounts shortly after receiving a letter from the firm's attorney.

At the end of the 1995 construction season, Greg and Steve made arrangements to accept payment for construction work using either VISA or MasterCard. The necessary electronic transfer equipment had been ordered, and new project proposal forms were being printed indicating the use of credit cards as an alternative to the firm's other payment terms. The credit card companies have promised to wire payment within 48 hours of any such electronic sale transaction. To use this credit card service, QA will be assessed a fee amounting to 2.5 percent of the actual sale. Greg and Steve expect that credit card payment will be attractive to many of their customers and that the fee will be more than offset by the savings in the fees paid to the firm's attorney to collect past-due accounts. Pending legislation in the U.S. Congress also would permit many federal agencies to use credit cards to pay for maintenance work. If the legislation is passed, Greg and Steve hope that QA will benefit from being the only paving competitor in the area to offer a credit card payment option.

Through the efforts of Don and Greg, QA has developed a good working relationship with most of the local general building contractors, all of whom hire subcontractors for their paving work. Many of these building contractors negotiate directly with QA rather than using a bidding process for the paving work. QA believes it receives this preferential treatment because QA generally can do

the work in a timely manner, whereas Svenson gives priority to road paving and larger commercial and industrial projects.

QA was qualified by the state DOT to bid as a prime contractor on state projects valued at a maximum of \$4.5 million. However, because of the Halvensen's collateral value, QA's bonding company restricted QA's bidding to projects with a maximum value of \$1 million. If the firm wanted to bid on projects larger than \$1 million, the owners must schedule a personal interview with the principals of the bonding company to determine if special circumstances warrant a variance to this bonding limit. A waiver of this restriction was granted by the bonding company the one time it was requested to repair flood damage for the U.S. Army Corps of Engineers in 1994.

When QA is bidding to become the prime contractor on a project for which subcontractors will be required, Greg contacts firms in the needed specialty trade to determine which ones would be available to do the work and to obtain an estimate of their price for the subcontracted work. Greg and Don have continued to work with several specialty trade subcontractors with whom Mark Halvensen developed mutually beneficial and cooperative relationships.

QA and Svenson were the only two local firms that had the capacity to bid on larger projects in the local area. When bidding was required to obtain paving work, whether for publicly or privately funded projects, QA's policy was to bid on as much work as possible, until the firm had a large backlog of work. Such a work backlog was considered necessary to keep QA's field labor crews busy. However, a work backlog with many projects with deadlines and penalties for late completion could erode profitability if weather delays required crews to work considerable overtime. When the workload scheduled was more than a month, QA raised its bid price, a common industry practice when a firm did not especially want to be awarded the project. Greg and Don believed that QA should always bid on local paving projects for which they were qualified. Because of Svenson's larger resources, especially since the firm was acquired by Packer Paving, QA could not compete on price when Svenson really wanted the work. However, the company felt that allowing Svenson to bid for projects unopposed would be an invitation to firms outside Williston to bid for work in the Williston area. By bidding on all local projects, even if its bid price was high, QA

might win a project at a price premium if there were no other bids on the project.

Large highway projects often attracted bids from large heavy construction firms from other parts of the state and from nearby states, not only from firms in the vicinity of the project site. When successful, many of these large nonlocal construction firms would set up their own high-volume, portable asphalt plants. Once a remote asphalt plant was in operation, any extra asphalt capacity not needed for the highway project would then be available to pave other projects in the local area. To get such work, the nonlocal construction firm was likely to enter a bid just marginally above its variable production cost. Such bidding activity would reduce the number of bids awarded to either QA or Svenson. This, in turn, would force Svenson to compete for work on smaller projects that it would normally not pursue. Ultimately, QA's work volume and its profitability could be adversely affected by such a chain of events.

Packer Paving was the state's largest paving company with subsidiaries throughout the state, including Svenson with operations in New Brighton and Williston and Hopkins in Hartford. Packer Paving had the ability to move either portable asphalt or concrete plants anywhere in the state to complete a project. However, Packer Paving's policy was not to compete with its subsidiary paving firms unless the project was very large. Similarly, its subsidiaries were restricted from competing for projects within the service area of another Packer Paving subsidiary. This corporate policy precluded Svenson from bidding on work in Hartford and Hopkins from bidding on work in either New Brighton or Hartford. Both subsidiaries, however, could bid for jobs in the Smithtown-Mt. Pias area because Packer did not have a subsidiary located in that portion of the state.

QUALITY ASPHALT'S ACTIVITIES AND OPERATION

QA's asphalt plant, rock inventory, equipment storage, and office were located on a 1-acre gravel-surfaced site in the industrial park on the outskirts of Williston. The company leased its premises from Mark and Doris Halvansen on an annual net lease basis, paying \$48,000 during the fiscal year ending September 30, 1995. In 1995, QA and Svenson were the only two firms in the Williston area that pro-

duced asphalt. While Svenson also sold its asphalt mix to other local paving contractors, QA produced its mix only for its own use. Svenson, headquartered in New Brighton, employed 150 people and operated three asphalt production plants: its original and largest plant in New Brighton, one in Williston, and the newest plant located on leased land on Magna Mining's rock quarry property about 10 miles east of New Brighton. Together Svenson's three plants produced 10 times QA's annual asphalt volume of 50,000 tons in 1995.

QA's asphalt production facility consisted of a small drum-style asphalt plant and a 30-ton insulated (but not heated) storage silo. The insulated silo was purchased in 1991 to reduce waste (asphalt with a temperature below 250°F) and thereby lower the material cost per ton paved. Some asphalt produced early in the day could be stored in the silo for use in the late afternoon. QA's drum-style asphalt plant operated as a continuous-flow system and, under ideal operating conditions, could produce 800 tons of asphalt a day. However, this continuous-flow system limited QA's ability to produce a variety of different asphalt mixes on the same day for different paving projects. This limitation required QA to carefully schedule small jobs that required the same paving mix on the same day. Many road paving projects require production capacities in excess of 1500 tons per day in order to complete construction within the project time frame. With its limited production capability, QA has been unable to bid on such projects. It may be noted that about 3000 tons of asphalt are required to pave a 4-inch layer of asphalt on a 1-mile stretch of two-lane highway with a standard width of 24 feet.

Greg would like to eliminate both these production limitations. One solution would be to buy a 200-ton heated asphalt silo, which would effectively increase QA's daily production capacity. By beginning asphalt production earlier in the day for a small job and then using the insulated silo to store this mix, asphalt production could then be changed to a different kind of mix for another, larger project. The heated silo would be used to store the extra mix from the second production to begin the morning's paving work until more of the second mix was made. Another way to overcome the capacity constraint would be to replace or augment the existing drum-style plant with a 1000 or more ton per day batch plant. A batch plant, producing each truckload of mix individually, would

provide the ability to change the mix between truckloads.

QA's policy was to purchase major pieces of equipment at auction. A used 200-ton heated silo, purchased at auction, would cost about \$120,000, including its setup. Depending on its condition and size, a used 1000-ton or larger batch plant would cost between \$1 million and \$1.5 million, including transportation and setup costs. This policy of purchasing used equipment that could be repaired in-house was instituted by Mark Halverson when QA was founded. Since many construction firms experience bankruptcy, especially during economic recessions, other firms often could acquire relatively new equipment at bargain prices. Because QA purchased its equipment used, repair and maintenance costs were high. However, high employee turnover also contributed to this expense because short-term employees often do not take care of the equipment as well as they should. As of 1995, QA did not have a preventative maintenance program.

In 1995, QA's paving-related equipment included eight tandem axle (16-ton load) dump trucks, three tractor trailers (20-ton load), two end loaders, two paving machines, and several other pieces of paving machinery. The trucks were used to deliver asphalt mix and to haul other materials required for paving preparation work to the paving site. The end loaders were used primarily at its facility site to move rock from inventory to the asphalt plant, in paving preparation to create the rock underlayment, and to assist in snow removal during the winter. QA also owned 10 pickup trucks that were used by the paving supervisors, the management, and the sales assistant. QA had a rotation program to replace its pickup trucks every 5 years. No such program existed to replace its production equipment or larger vehicles.

Within the last year, QA purchased equipment to broaden the scope of the work it can perform on paving projects. The new equipment included a shouldering machine for placing rock along the edge of new pavement, a concrete breaker attachment to break up old pavement into small pieces, and a small tractor backhoe. By limiting its dependence on other firms to perform such work as pavement breaking, culvert installation, and shoulder preparation, QA has been able to bid as a general contractor on more complicated asphalt paving projects. Doing more work in-house also shortened the time frame for completing projects. Not only could some crews be kept working on

days when the weather is unfavorable for paving, but a great deal of time was saved by not having to coordinate the work with subcontractors.

The total cost of QA's equipment and leasehold improvements as recorded on its 1995 balance sheet are summarized below. Overall, at the end of 1995, the firm's property and equipment were about 53 percent depreciated. This depreciation is somewhat misleading, since most of the equipment was purchased used. (Refer to Exhibit A for the firm's financial statements.)

Quality Asphalt's Property and Equipment.

Construction equipment	\$1,300,000
Transportation equipment	730,000
Office equipment	50,000
Leasehold improvements	25,000
Total property and equipment	\$2,105,000

In addition to housing its asphalt plant and office on its 1-acre gravel-surfaced site, QA also had six stockpiles of various sizes of rock aggregate that occupied about three-fourths of the total area. QA's main supplier of rock has always been Barnes Stone (now controlled by Packer Paving), located within 4 miles of QA's site. The only two alternative sources of supply were Magma Mining on the outskirts of New Brighton (where Svenson had located its newest asphalt production facility) and Henderson Quarry near Hartford (owned by Packer Paving).

QA's rock supplies were delivered by dump truck and unloaded onto the appropriate pile on its site. As needed, rock was transferred from these stockpiles to the asphalt plant using an end loader. The rock stockpiles were separated from one another as much as possible to avoid any intermingling of different sizes of rock. Despite efforts to separate the rock piles from one another, contamination often occurred during heavy rains and from the tendency of rock to spill from the trucks and end loader as they moved through the plant site. The gravel surface of the site also tended to become bumpy from rock spillage and mud holes that develop from rain. When dry, loose chunks of mud often were thrown into the rock piles by truck tires, which further aggravated the rock pile contamination problem. The office area also was af-

ected because mud was easily tracked inside, and on dry, windy days, dust blew inside the building.

QA has considered constructing a bin storage system for its rock inventory. Such a system would take up less space and reduce the contamination problem. In addition, the bin walls would provide support for a roof system that would protect the stockpiles from rain. Rock that was contaminated with water increased the time required to produce the asphalt mix, since the water had to be evaporated before the rock could be added to the asphalt cement. To purchase and install such a storage bin system has been estimated to cost \$500,000. Consideration also has been given to using excess asphalt (left over from a day's paving project and which is still above 250°F) to gradually pave the site area. Asphalt that falls below 250°F cannot be used for paving and must be disposed of in accordance with government regulations at designated locations for a fee. On average, QA must dispose of between 3 and 15 tons of asphalt per day, of which about 20 percent is still hot enough to use for paving.

Greg, who was responsible for ordering the paving materials, had been concerned about Barnes Stone, the rock supplier. Since Packer Paving purchased controlling interest in Barnes Stone in 1993, Greg had noticed that not only had rock costs risen, but Svenson had been receiving preferential treatment when a particular rock product was in short supply. Because about 32,500 tons of different sizes and types of rock were required to produce QA's 50,000 tons of annual asphalt production in 1995, and because rock aggregate is bulky and QA's storage area is limited in size, QA cannot maintain a large safety stock of each type.

Both asphalt and concrete pavement used for publicly funded projects must meet the standards specified for the project. This requires that the paving mixtures be tested frequently. If test results fall outside the specified parameters, a penalty is assessed against the general contractor (and if subcontractors were being used, the general contractor would then penalize the appropriate subcontractor). QA has the ability to conduct some of the required tests but not all of them. As a result, QA must outsource some of its testing. QA has always outsourced such work to an independent testing firm located 70 miles from Williston. Svenson was the only firm in the area with the required capability to complete all its own testing. To add the equipment it would need to do all test-

ing internally would cost QA approximately \$100,000. In addition, a qualified individual would be required to perform the tests. QA's sales assistant, Steve Lorens, was the only employee with the necessary qualifications of both knowledge of asphalt production and statistics.

In addition to overcoming its asphalt production limitation in Williston, Greg would like the firm to expand geographically by purchasing another asphalt plant to be located in the Smithtown-Mt. Pias area. Although QA had not bid on any work in this area since 1993, Greg believed the asphalt paving market in this part of the state had tremendous growth potential. In the early 1990s, this area had only one larger-sized asphalt paving firm, Davidson Paving, which also did concrete paving but did not produce its own paving mixtures. Davidson purchased its asphalt and concrete mixes from Capital Asphalt and Concrete in Mt. Pias. Although Capital was the only asphalt producer in that part of the state, Capital had never been involved in asphalt paving. After failing to meet the completion date on a large paving project in 1994, Davidson was forced by its bonding company to sell off a considerable amount of equipment at auction in order to satisfy debt payments. Since then, Davidson had limited its activities to concrete paving of parking lots and municipal streets. Since no other firms in the area were large enough to bid for governmental asphalt paving work, most of the governmental agencies in the region had recently specified only concrete pavement, even though many of their engineers indicated a preference for asphalt.

When QA was preparing to begin a new project, Don scheduled the project using a simple type of Gantt chart showing when QA's various crews would be working on which projects. Greg was then responsible for getting any needed subcontractors to sign a contract with QA and for ensuring that the materials would be available in inventory when they were needed. QA generally had three or four projects being worked on at the same time, often at sites that were geographically separated by 30 or more miles. Don, who managed all field operations, was very skeptical of geographic expansion because he already spent a considerable amount of time traveling to the various sites to help resolve problems that had arisen. Although the field supervisors in many cases had the experience to make appropriate decisions, they often seemed unwilling to do so, especially when

working on road projects that got behind schedule due to unfavorable weather. On an especially harrowing day, Don was heard to say: "Large projects tend to control the company rather than the company controlling the project."

Some of QA's field employees had suggested that the firm also should do concrete paving and sewer construction. Adding these two activities would give QA the ability to become a completely in-house general contractor on almost all municipal road construction projects in the Williston area. If QA decided to add concrete paving to its paving construction activities, there would be no need to produce its own concrete, since there are five firms in Williston that produce concrete mix for other firms and deliver it to the site. However, other equipment would be needed for concrete paving. A used concrete paving machine would cost \$300,000 to \$500,000, and a curb machine would cost about \$75,000. One advantage to acquiring a curb machine is that both asphalt and concrete streets require concrete curbs.

If QA were to expand its activities to include concrete paving, the firm would face significantly more competition. Almost anyone with hand tools and a pickup truck can become a concrete contractor for sidewalks, driveways, and small parking lots. In 1995, Williston had four large concrete paving firms competing for road and parking lot construction, as well as 25 small firms competing for smaller projects. There were also 10 sewer contractors. Although QA had constructed street-level culverts that connect to storm sewers, QA lacked the capability of actually constructing the storm sewers. Sewer construction would require specialized equipment, estimated to cost about \$500,000, that cannot be used in road construction.

EMPLOYEES AND PERSONNEL MANAGEMENT ACTIVITIES

In 1995, QA employed a total of 39 people, including Mark, Doris, Don, and Greg Halverson. QA's 25 laborers were divided into five field crews: a dedicated paving crew, three full-time site preparation crews, and one multitask crew capable of handling site preparation and asphalt paving, as well as limited excavation, grading, and storm sewer and drain tile construction. Each of these five crews was headed by field supervisors. Additionally, QA employed a yard supervisor for the rock and equip-

ment, an asphalt plant operator, a sales assistant (Steve Lorens), an office manager (John Richards), and an office worker (Janice Jeffries).

When paving and related types of work could not be done due to rain or cold weather, QA's crews were given time off without pay. When the paving operation was shut down for the winter season, the field laborers were placed on seasonal layoff, while the remaining personnel worked part time. During this 4-month period, the supervisors and asphalt plant manager engaged in equipment, vehicle, and facility maintenance and were on call for plowing snow. Although QA had an arrangement to plow snow for a few commercial and industrial customers, the firm had not made a major effort to expand this winter activity because snow removal was hard on the equipment.

The starting wage for the 25 field laborer positions at QA was \$8 per hour in 1995, with a pay review scheduled at the end of a 90-day probation period. When positions became available, field laborers who had survived the probation period and had experienced the variety of work required for paving are promoted to other supervisory positions or to positions as equipment operators, if they had an appropriate license. A commercial driver's license was required to operate dump trucks and tractor trailers. All of QA's field supervisors were required to hold a valid commercial driver license. Operation of the liquid asphalt tanker required a license to haul hazardous materials because liquid asphalt was classified as a hazardous material by the DOT. No license was required to operate "off road" equipment.

Because of the low unemployment rate, QA has found it difficult to find and retain laborers. Employees often will seek other positions with industrial or commercial firms soon after they realize that shoveling hot asphalt on summer days is difficult work. John Richard's review of company employment records revealed that, on average, one laborer position turned over every week. Since about a month is needed for a new employee to become relatively proficient working on a paving crew, almost all of QA's work crews were constantly either short a laborer or had an inexperienced person to train. In 1995, only a few nonsupervisory employees had been with QA for more than 3 years. In contrast, the six supervisors and the asphalt plant manager had an average tenure of 7 years with QA.

None of the local asphalt paving firms had a

unionized labor force in 1995. Svenson had been unionized until it was purchased by Packer Paving. Under its new ownership, Svenson had published new terms of employment designed to bring wages and benefits in line with Packer's nonunion operations. The union that had represented Svenson's employees then voted to strike, but within 2 months most of the employees returned to work under the new labor conditions. As a result of this union-busting action, several of the unionized general contractors in the Williston area began to hire QA for paving work rather than Svenson. Nationally, 16.7 percent of the U.S. workforce was represented by unions in 1995. Workers represented by unions earned one-third more in 1995 than workers not represented by unions.

Average hourly earnings in 1995 for U.S. construction workers, of whom 18.8 percent were represented by unions, were \$15.08. This earnings figure may be compared with the average hourly earnings of workers from all industries of \$11.44. Throughout the year, construction workers averaged 38.8 hours of work per week, compared with the 34.6 average hours of work per week for all workers for all industries. It also may be noted that the minimum wage rate established by the federal government was \$4.25 per hour in 1995, although some states had laws establishing higher minimum wage rates. During the 34 weeks of paving in QA's fiscal 1995 year, QA's field workers averaged almost exactly 40 hours per week, although some weeks included several hours of overtime work. If a project deadline was in danger of not being met, QA's policy was to reassign crews from other projects to expedite the delayed project's completion rather than to use overtime, which would significantly increase labor cost.

As part of QA's hiring process, and consistent with the statute of the state in which QA operates, all acceptable applicants were hired conditionally and required to submit to preemployment substance abuse testing. QA also required such testing (also permitted by state statute) for all employees who had been involved in a serious work accident or demonstrated unusual behavior that could endanger the life of other employees. Even though state law permitted random testing of employees for substance abuse, QA did not do so. The firm believes its policies have improved employee performance and the quality of their workforce.

Although no firms are required to provide fringe benefits for their employees, and small firms

cannot usually afford to do so voluntarily, QA provided some employee benefits. The company had an employee health insurance program, available after the 90-day probation period. Under this program, the company contributed \$80 per month to offset some of the insurance premium for its employees' health insurance plan and allowed its employees to have the remainder of the premium cost deducted from their weekly paychecks. Because the business was seasonal, the firm also offered to help its employees manage their yearly cash flow. A pay-ahead schedule was made available that allowed employees to have additional money deducted from their weekly pay checks during the summer to cover insurance premiums due in the winter when they were on seasonal layoff. The firm also provided a term life insurance policy for each employee who had been with QA for at least 1 year equal to their annual wage or salary. At the beginning of the year's paving season, QA also provided a wage or salary increase based on the increase in the cost of living for all employees who had been with the firm at least since the beginning of the previous year.

The Halvensens believed that employees needed to have a vested interest in the firm if QA was to be successful. Therefore, each December every employee who worked the entire season received a year-end bonus of 1 percent of the wage or salary earned during the year. Greg had suggested tying the bonus to the firm's profits rather than wages. He reasoned that such a change would encourage the employees to work more efficiently, thereby reducing material waste, which would lower the firm's construction cost, and increasing labor productivity, which would allow the firm to complete more revenue-generating projects. However, Mark and Doris vetoed his proposal because they did not want their employees, nor their competitors, to know QA's profitability.

ACCOUNTING AND OFFICE MANAGEMENT ACTIVITIES

QA's income statements (Exhibit A) were structured somewhat unusually in order to make it easier for Greg to prepare bids. General and administrative salaries included the compensation (wages and benefits) paid to Mark and Doris Halvensen, John Richards, and Janice Jeffries. In 1989, Mark began receiving a salary, rather than an hourly wage rate as Greg had joined the firm, taking over

his father's sales responsibilities. The firm's contribution to Social Security (6.2 percent of all earnings) and Medicare (1.45 percent of all earnings) taxes for these four people were included in other G&A expenses. All remaining employees were paid an hourly wage rate. Construction labor included the compensation (wages and benefits) for all the firm's other employees, including Don and Greg Halvansen and Steve Lorens. QA's contributions to Social Security and Medicare taxes for these employees were included in other construction expenses. Other construction expenses also included equipment, maintenance and repair costs, fuel costs, and rental costs for equipment that QA required for a specific job but did not own.

Since joining QA, Greg had developed a strong working relationship with First State Savings, a locally owned bank. At mid-November, 1995, QA had 13 notes outstanding, all with First State Savings. Through Greg's efforts, none of the notes required monthly payments from the end of December until the end of April. All the notes were secured by the firm's vehicles and equipment, whose purchase the debt financed. The notes on more recent fixed-asset purchases carried interest rates ranging from 9.5 to 10.5 percent. The schedule of future principal repayments is shown in the table below. When Doris saw the principal repayment schedule, she expressed concern that the debt burden was too high. She said that if the number of local building permits continued to decline, QA's sales could drop even more, and if that happened, the firm's profitability would fall and QA might be unable to repay its debt obligations.

Quality Asphalt, Inc.
Principal Repayment Schedule

September 30, 1996	\$126,000
September 30, 1997	\$117,300
September 30, 1998	\$108,000
September 30, 1999	\$ 83,600
September 30, 2000	\$ 30,100

John Richards and Janice Jeffries were responsible for all of QA's paperwork, including bookkeeping, compliance reporting, billing, and personnel record keeping. The firm outsourced its legal, accounting, financial reporting, and auditing work. QA must have its five largest projects audited at the end of every year. This special audit report must be

submitted to the contract compliance office of the state highway department in order for QA to remain on the list of contractors qualified to bid on state-funded or state-administered projects.

During the construction season, Janice was responsible for tracking the construction materials ordered, by product type, in order to verify bills as they were received from suppliers. Time cards were used for payroll purposes. Each day all construction employees who were paid an hourly wage were required to record the number of hours they worked. The firm's receivables and payables, including payroll, were monitored using the Peachtree computerized accounting system that Greg and John selected in 1990.

Because QA engaged in both manufacturing (asphalt production) and construction activities, the firm was subject to both general industry and construction industry Occupational, Safety, and Health Administration (OSHA) regulations. In addition, the firm must comply with the requirements of many other regulatory agencies, including those of the Environmental Protection Agency (EPA), the Equal Employment Opportunity Commission (EEOC), the state department of transportation (DOT), the Federal Highway Administration (FHWA), and the Immigration and Naturalization Service (INS) for employee citizenship status checks. John was responsible for filing the necessary compliance reports and for keeping abreast of legal developments that were likely to affect the firm's operation. He also was responsible for hiring employees and for the substance abuse testing, since employment and medical records must be kept confidential.

Because of the pending conversion of all publicly funded projects to metric measurements, John planned to institute a metric training program for the firm's employees. Several state- and FHWA-funded projects had already been awarded using metric units exclusively. Conversion would require some minor equipment changes and changes to QA's record keeping and documentation. Don Halvansen was convinced that many laborers and several of the supervisors would resist the changeover to the metric system as long as possible. Furthermore, because the conversion would not apply to privately funded projects, the firm's employees must be "fluent" in both the English and metric systems. Otherwise, errors would most likely be made in preparing bids and in the actual construction work. If project costs were underestimated, the

firm could lose money if it was awarded the project, and if project costs were overestimated, the firm could lose the opportunity to earn revenue. Measuring errors in the field operations could result in having to redo work, causing considerable waste of materials and labor time.

Although time cards were used for payroll purposes and construction material purchases were carefully monitored, QA had no internal job cost accounting system to determine the actual costs of various paving projects. As a result, cost estimates for bidding purposes tended to be based on “educated guesses.” According to John, if the time cards recorded not only the number of hours worked but also the projects worked, much more accurate project cost information could be generated. However, Don did not believe the field personnel would cooperate simply because they were too exhausted at the end of a long day to want to do more paperwork. Steve Lorens requested that the firm buy a computer software package, such as Timberline, designed for construction contractors to integrate project estimation and job costing. Besides the estimated cost of \$25,000 to set up such an integrated system, John was concerned that the new system would be incompatible with the present office software.

Greg used Microsoft Works computer spreadsheets to develop project bids. QA’s bids and quotes for work that was not bid were based on the sum of three components. (Refer to the income statement in Exhibit A.) Greg considered all items included under cost of construction to be “variable costs.” When these variable costs for the project had been estimated, a “fixed cost” overhead allocation was included. This fixed-cost component included all the items listed under general and administrative expenses. These total fixed costs were then allocated to the project based on the project’s estimated asphalt tonnage as a percentage of the estimated total asphalt tonnage for QA for the year. Finally, the project price was adjusted based on Greg’s overall assessment of the situation. The bid price would be raised or lowered to reflect QA’s backlog of work or to match Greg’s estimate of competitors’ prices or the price Greg believed the market would bear.

As of 1995, QA did not have an objective that related to winning a specified percentage of bid projects, nor did it have a policy to include a specific profit margin percentage as part of the bid price. Greg was aware of the limitations of the sys-

tem for preparing bids. He was concerned that without a job costing system, the firm could not really know if it had made a profit or suffered a loss on any given project. He believed that having such information would be valuable in establishing guidelines for pricing certain types of projects. Greg’s approach to bidding was to bid each project “to make as much money as possible, given the limited costing information available.” Don continued to oppose such changes primarily because he believed that implementation would be burdensome on all the construction-related employees. “Why do we need to do this now when we have operated fine without it for over 25 years?”

PLANNING FOR TOMORROW

As Greg sat alone in his office reflecting on QA’s history and current activities and examining the financial statements, he became even more convinced that QA had to move forward. But how could he convince his brother and parents that growth was in all their best interests? If the economy remained strong in 1996, sales and profitability probably would both improve somewhat. But he was sure that such modest growth wouldn’t be enough to support three generations of Halvensens in the future. But which opportunities would be best for the firm? Expansion would require more debt and more interest expense. Just how much could QA afford, and how would that limit its choices? Surely not taking advantage of opportunities would “pave the way” for Svenson to exert even more control in the Williston area in the future. But expansion probably also would intensify QA’s rivalry with Svenson, at least in the short run. Could QA handle it? If Don continued to feel pressured in managing the field operations, then would doing more jeopardize QA’s reputation for quality work and timely service? Even though their parents weren’t as actively involved in the business as they had been, they still did pitch in when needed and still made all the major decisions. But would they continue to help as they had for the last 5 years, or would they finally retire completely? And if they did retire, who would “be in charge” with final say about the firm’s direction? Of course, if they didn’t have their parents’ salaries to pay, they could afford to employ more people to help Don. Just what should he say tomorrow at the family’s Thanksgiving “powwow”?