Washington State Gasoline Prices Study

1990

Biennial Findings And Technical Appendices

Washington State Energy Office

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EXECUTIVE SUMMARY

Background

In spring 1990, responding to strong public and private concern over gasoline supplies and pricing policies, the Washington Legislature commissioned the Washington State Energy Office (WSEO) to study this issue. The responsible committee – the Legislative Transportation Committee (LTC) – asked WSEO to clearly explain why gasoline prices differ from city to city in the state of Washington.

This report summarizes the conclusions of a 1 year investigation. To support this investigation, WSEO collected data from 51 cities throughout the state of Washington, representing 750 gasoline stations, 10 refiners, and 131 gasoline wholesalers. To try to explain city-to-city and region-to-region differences, we collected information on prices, volumes sold, suppliers, on-site convenience stores, cash discounts, whether a station was independently owned or oil company owned, and a host of other factors. About 150 factors were sought to assist in the analysis.

Findings

WSEO found significant differences in gasoline prices from city to city in Washington. The difference was 12.8 cents per gallon on average between minimum and maximum city prices. Prices in greater metropolitan Seattle averaged 4.9 cents below the combined average of all other cities west of the Cascades, and 4.5 cents below the combined average of all other cities east of the mountains.

WSEO also conducted a more sophisticated statistical analysis of these data to try to explain which of the many variables might be responsible, singly or in combination, for some of the differences. Our study found that eight key variables explain approximately 80 percent of the variation in average prices. In statistical terms, this is a very strong finding. The key reasons for different prices include:

- The cost of transporting gasoline from refineries to stations
- Market demand for gasoline, measured as vehicles per square mile
- Whether or not a station is located within 30 miles of the Canadian border
- Dealer margin
- Retail sales volume
- Whether or not a station offers a discount for cash
- Whether a dealer is supplied by an oil company or distributor
- Average wholesale price

Of these eight variables, three are related to the overall market (transportation cost, market demand, and proximity to Canada), three reflect retail market factors (dealer margin, sales volume, and cash discount), and two operate at the wholesale level (supplier and wholesale price).

Of all the factors in the analysis, gasoline transportation cost is the single most important variable, explaining 20.5 percent of price differences statewide. Following closely is dealer margin, which accounts for about 18.5 percent of the variation in prices. Higher transportation costs and margins lead to higher retail gasoline prices.

The third most important variable is retail sales volume, which explains 18.3 percent of the variation in prices between stations. Market demand for gasoline is also an important factor. Measured in terms of the density of vehicles in a market area (vehicles per square mile), market demand explains 9 percent of the price variation. As volume and vehicle density increase, retail price decreases.

Stations offering cash discounts have prices averaging 1.5 cents lower than stations that offer no discounts. This accounts for about 4 percent of the variation in prices statewide.

Proximity to Canada is another key variable that explains about 4 percent of the price variation. Canada has significantly higher gasoline prices than the United States because of higher gas taxes. We found that stations within 30 miles of the Canadian border post higher prices.

Prices are also affected by whether a station is supplied by an oil company or by a distributor. This accounts for about 2 percent of the statewide variation in prices. Stations supplied by distributors tend to have higher prices. Though the variation explained across the state is small, this difference can be important. The exact reasons for the difference are unclear. Our model indicates that the average difference is roughly 1.6 cents per gallon. The variable is also more important when Seattle is compared to other cities. Stations outside the Seattle area are more often supplied by distributors. As a consequence, this variable accounts for 12 percent of the difference in price between Seattle and east-side cities.

Estimated average wholesale price explains just under 2 percent of the variation in prices. While distributor wholesale purchase prices are fairly easy to obtain, it is much more difficult to calculate the cost of gasoline to oil companies before they distribute it to their own stations-an internal wholesale price. Instead of attempting to calculate this for oil companies, we calculated average wholesale prices, which did not distinguish between distributor buying prices and oil company buying prices. To calculate these prices, we subtracted transportation costs from dealer buying prices. Higher wholesale prices lead to higher retail prices.

Study Focus

It is important to emphasize that this assessment was designed to focus on one key issue-whether regional price differences can be explained analytically. The assessment does not focus on the business practices of the petroleum industry, which have been the subject of other studies and proposed legislation.

It is also important to recognize that there have been significant changes in the gasoline marketplace. Gasoline prices are no longer regulated by the state or federal government. In general, retail stations can charge whatever they like, provided that they meet standards of fairness and are not undercut by competition. The industry is also continuing to adjust to deregulation. One unforeseeable consequence of deregulation has been the growth of alternative services like convenience stores at gasoline stations. These stores may have a great deal to do with the profitability or existence of a gas station. This was certainly not the case a decade ago.

Environmental laws-particularly those requiring replacement of leaking underground storage tanks-are also having a significant influence on the cost and risk of operating a gasoline station. Almost 15 percent of the stations that returned surveys either were closing or had plans to close, in part, because profits were being squeezed and the cost of tank replacements cut margins beyond reasonable levels.

These marketplace changes are likely to affect independent and rural dealers more severely than high-volume urban stations. Competition in the marketplace could decline. With continued support from the Legislative Transportation Committee, WSEO expects to provide data and analysis on the changing marketplace and its key characteristics.

INTRODUCTION

This report is organized into four chapters. Chapter 1, Background, is a brief discussion of the petroleum market and some of the changes that are affecting present and future prices. Chapter 2 describes the statistical model and its results by city. Chapter 3 describes other studies of petroleum pricing and explains how WSEO's data and results differ. Chapter 4 is a collection of graphs with explanations supporting study findings.

Three appendices are also provided. Appendix A describes in more detail the procedures used in developing the statistical model used for the study. Appendix B provides examples of survey instruments. Appendix C includes much of the data collected and used in this analysis. Some of the data are not available to the public because respondents required that it not be released. A bibliography is included at the end of the report.

Chapter 1

BACKGROUND

Since the first Arab oil embargo in 1973, gasoline pricing and supplies have been volatile and controversial public topics. Despite ample international supplies, regional crises and marketplace changes continue to exert strong influences over gasoline pricing. Consider the grounding of the Exxon Valdez or the Persian Gulf War for examples of how quickly markets can change. Other factors, including gas station closures, have a less dramatic but perhaps longer lasting influence on prices and supplies. Pricing is controversial. Following both the Exxon Valdez accident and the Persian Gulf War, an angry public accused oil companies of price tampering.

Even without precipitating events, Washington legislators report their constituents believe gas prices are set without reason; that transportation costs do not seem to explain price differences. They report that Seattle always seems to have the lowest prices, despite being further from refineries than Bellingham.

As important as it is to understand specific markets and characteristics that may push prices up or down, it is just as important to understand the general market within which all the smaller markets work. Four key background factors should be kept in mind: 1) gasoline prices are no longer regulated by the state or federal government, 2) deregulation has and will continue to play a role in the structure of the industry, 3) a range of state and federal clean air and water regulations will also change the shape of the market, and 4) a diverse array of players participate in Washington's petroleum market.

Gasoline Is Sold In an Unregulated Market

In the 1980s, gasoline markets were largely deregulated. In contrast to natural gas or electricity, where prices are directly related to cost, the price of gasoline can move to whatever levels the market will bear. Oil companies are under no requirement to charge based on what it costs to produce, refine, transport, store, and advertise their product. They must meet fair business practice requirements-including treating their own stations and independent dealers equitably and not colluding or fixing prices.

In such a market, economic theory tells us that prices will move toward the marginal cost of opening new stations, replacing refineries, and building new pipelines. At the same time, any oversupply in the market can bring rapid reductions in cost as consumers move from one supplier to another.

Perfect competition does not exist in Washington and not all areas are equally competitive. Because Seattle constitutes a large and growing market, gasoline marketers focus their attention there. In some areas of the state where growth is stagnant or where population is decreasing, fewer marketing resources are dedicated to establishing and holding markets, and prices may be significantly higher.

The unregulated nature of the market affects the current study in two ways:

- In an unregulated market, prices may be related to a number of factors that are difficult to measure. For example, how can we measure the degree to which marketers believe a market is worth pursuing? To provide some guidance, we have used vehicle density as a "proxy" for the demand for gasoline, which measures how much a market might be worth.

- The Washington market is still structurally adjusting to deregulation and may experience major changes in the future. These structural changes may result in changes to the price differences we calculate. The variables that explain pricing in 1990-1991 may be less satisfactory in a few years.

Deregulation Will Reshape Markets

Ninety-eight percent of stations responding to WSEO's survey supplement their gasoline sales with profits from alternative profit centers such as convenience stores, service racks, tire sales, and hauling rentals. Half of the gasoline sold in Washington is through stations with convenience stores. This is a major marketplace change. Convenience stores can add to volume and stability, and may allow

managers to set gasoline prices artificially low. Under other market conditions, store sales may make up for poor gasoline sales.

The clear message is that stations unable to develop profitable alternative profit centers may face loss of the business. If, indeed, stronger competition is an outgrowth of deregulation, we should continue to see 1) innovative advertisement and contract arrangements and 2) efficiency efforts, such as the movement toward fewer large volume outlets. A leaner, meaner industry will have casualties to competition. Again, rural areas with smaller markets and less competition may be disadvantaged.

Environmental Regulations and Demands Will Reshape Markets

Underground storage tanks (USTs) throughout the United States have leaked large quantities of gasoline and other hydrocarbon pollutants into ground water. In an effort to ensure groundwater purity, the federal Environmental Protection Agency (EPA) has ordered the removal or replacement of all unsafe underground storage tanks.[1] At the direction of the Washington State Legislature, the Department of Ecology (DOE) has developed state regulations to implement the federal standards. All gasoline stations in Washington must meet federal and state requirements for old tank removal, new tank installation, leak detection, and pollution liability insurance. Compliance dates are scheduled by tank age and business size with the latest compliance date in 1993.

Our study suggests that these regulations could have a significant effect on Washington's gasoline market. Of all the stations who returned our survey, 14 percent claimed they were likely to close their businesses due to UST regulations. It is unlikely that marginal businesses will be able to raise the capital for new tanks. Other station owners may choose not to risk such investments on the chance that business will be increasingly marginal in the future. Those who can raise the capital for new tank installation may have difficulty securing the required $1 million in pollution liability insurance. While it is possible that many of these stations would close without the additional tank storage burden, it is clearly risky to operate a marginal business in a rapidly changing industry.

The Washington State Legislature has taken two actions to ameliorate these problems. In 1989, the legislature created the Pollution Liability Insurance Agency to provide affordable pollution liability insurance. Two insurance companies are under contract and the agency acts as a reinsurer to underwrite the bulk of the premium. Reinsurance funds come from a petroleum products tax, reinsurance premiums, and interest earned on the agency trust account. A second law provides grants for tank replacement and testing where public or private owners of USTs meet vital local government, public health, and safety needs.[2]

While the state continues its efforts to assist businesses in meeting environmental requirements, UST regulations still represent a net increase in business costs for gasoline marketers, and small businesses are the least able to comply.

Clean air regulations may soon have as strong an effect on market structure as clean water regulations have had. Vapor controls may be ordered at the federal or state level. In addition, alternative transportation fuels could add to competition-particularly in urban areas-and introduce new risks to station owners. If methanol, propane, natural gas, hydrogen, or electric operated vehicles begin to make inroads into the transportation market, marketers may be forced to make additional investments to remain competitive. These new fuels could have large impacts on the market structure of transportation fuel suppliers. In contrast to many of the other factors discussed in this report, this factor is more likely

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[1] See regulations in 40 c.P.R. Secs. 280 and 281 based on the 1976 federal Resource Conservation and Recovery Act, as amended - 42 U.S.C. Sec. 6901, et seq.

[2] See Substitute Senate Bill 5086, Underground Storage Tank Community Assistance Program, Washington State Legislature, spring 1991.

to raise prices in western than in eastern Washington.

Demographic Changes Will Reshape Markets

Because Washington is growing rapidly, environmental pressures on Washington's gasoline market are likely to increase.

In addition, because population growth is centered around the 1-5 corridor, it will remain a magnet for competition, and rural and eastern Washington markets will likely remain less competitive and higher priced.

There Are Many Players in Today's Gasoline Market

Major, Minor, and Independent Oil Companies

There is no internationally accepted definition for a "major" oil company. The term is usually reserved for the largest international companies with a refining capacity of at least 250,000 Bbl/day. Minor oil companies have their own smaller refining capacity. Independents are oil companies without refineries. Independents purchase their product for resale and may be of various sizes. In Washington four major companies, Atlantic Richfield Company (ARCO), British Petroleum America (BP), Royal Dutch Shell (Shell), and Texaco operate refineries. One minor refiner, U.S. Oil, also produces gasoline in Washington. Major companies that market in Washington but do not have in-state gasoline producing refineries include Amoco Oil Co., Cenex, Chevron, Conoco Inc., and Exxon. Seven major companies: ARCO, BP, Shell, Texaco, Chevron, Exxon, and Union Oil account for approximately 60 percent of the gasoline sales to distributors or direct service retail outlets in the state.[3]

Integrated and Non-Integrated Companies: The petroleum industry can be characterized as having three main operational components: crude production, refining, and retail marketing. Oil companies have operations in some or all areas. A completely vertically integrated company has upstream production and downstream refining and marketing operations. When the price of crude oil is high, those companies that have crude reserves will see profits in production; when crude is priced low, a company's refining and marketing operations will be the source of stable profits. The seven majors who represent most of the gasoline marketing in Washington are all vertically integrated from production to retail sales.

Distribution by Refiners or Independent Jobbers: Some retail outlets have gasoline transported directly to their stations by refiners. These Direct Service stations carry the brand name of the refiner, but may not be owned or operated by the refiner. They pay **Dealer Tankwagon (DTW)** wholesale prices, which are not posted by most refiners. Refiners may use their own trucks for delivery or contract with a common carrier. Other retail outlets receive gasoline from distributors.

A distributor may serve both branded and unbranded stations, but contracts disallow supplying branded stations with gasoline from another brand. When serving branded stations, distributors purchase gasoline from an oil company at a bulk terminal and then supply stations carrying that oil company's brand name. They pay wholesale **Branded Rack** prices posted at terminals. Distributors have contracts for branded supply. Distributors with branded contracts are also referred to as **Branded Jobbers**. When serving unbranded stations, distributors purchase gasoline at **Unbranded Rack** prices, usually higher than branded prices, and supply independent stations. For their unbranded stations, and for farm,

[3] Washington State Department of Licensing, Monthly Motor Vehicle Fuel Reports.

municipal, and fleet accounts, distributors may purchase without contracts, trying to find the least expensive gasoline supply. Distributors that serve unbranded outlets are also referred to as **Unbranded Jobbers**. Some distributors are vertically integrated, operating their own retail outlets to complement wholesale deliveries. A distributor may have a local bulk tank farm for storing gasoline purchased when prices are low, or may operate tanker trucks only, never storing, simply transporting fuel. Depending on the operation, a distributor mayor may not have costs higher than a competing oil company.

Branded and Unbranded Retail Outlets

A station may carry a refiner brand, an independent oil company brand, or may operate under a non-oil company name. Stations of the same brand may have very different ownership, operator, and supplier situations. Station owners contract with suppliers to operate under specific names. Station contracts, especially in the case of refiner brands, may be quite extensive, requiring certain signage standards, facility improvements, advertisement requirements, etc. Discounts offered stations by refiners or distributors may be offset by the additional costs of being branded.

Retail Outlet Owners and Operators

Retail station ownership and operations status can be quite diverse. A station may be owned by an oil company, by a distributor, or by an entity that is not in the oil supply business. The station may be operated by the owner, leading to oil-company-operated stations, distributor-operated stations, and private-owner-operated (open) stations. Or, the owner may lease the station or part of it, such as the convenience store, to a third party to operate. Several studies have intimated that the number of open stations are decreasing while oil-company-and distributor-operated stations are increasing. The WSEO study database provides a baseline against which that hypothesis can eventually be tested.

Chapter 2

METHODS, APPROACH, AND FINDINGS

In July 1990, WSEO began soliciting extensive gasoline and market structure data from many of the operating gasoline stations, wholesalers, and refineries throughout the state. Data were collected from 51 cities throughout the state on a daily, monthly, and quarterly basis. Some 10 refiners, 131 wholesalers, and 750 retailers participated. Cooperation was entirely voluntary on the part of these businesses, and over 50 percent of those sampled responded. While not all stations or wholesalers provided all the data desired, WSEO's current database on petroleum prices and market conditions is among the most detailed in the United States.

For the purpose of this report, data from July 1990 through June 1991 were analyzed. By analyzing a full year of data, we were able to account for the normal seasonal variations in gasoline price and supply, and to smooth out peaks and valleys in the data. In several respects, however, the period was not normal. A federal gas tax increase took place in January 1991 and, more importantly, the threat and later existence of war in the Gulf caused temporary spikes in gas prices and threats of shortage.
In February, 1991, we provided the Legislative Transportation Committee (LTC) with a draft assessment that summarized our data collection effort and proposed a six-variable model to account for much of the variation in price between cities. WSEO distributed copies of this report to interested parties and has considered the comments that have been received. The model proposed here accommodates some of these comments and confirms the significance of the original six variables. Two additional variables were found significant and were added.

With respect to overall averages, WSEO found that gas prices differed significantly from city to city in Washington during the year. The average difference between minimum and maximum city prices was 12.8 cents during the 1 year study period. Prices in greater metropolitan Seattle averaged 4.9 cents below the combined average of all other cities west of the Cascades, and 4.5 cents below the combined average of all other cities east of the mountains. This is clearly significant, but should also be kept in context. It is, for example, less than the average price variation in milk, eggs, and cigarettes at convenience stores in the study. For the average driver in Washington, a 5 cent per gallon increment represents about $31.75 per year.[4]

The Model

The findings of this report primarily were based on a statistical model that attempted to explain which factors are responsible for differences in prices between stations and between cities. While we collected data from 750 separate stations during the study, the model was built on data from 269 of these stations. These owners provided sufficient data throughout the year. Graphs included in this study are primarily based on data from these 269 stations. We are satisfied, after analysis, that these stations are representative of average city prices. They may not be representative of all local characteristics (such as volume). Because data are always incomplete and averages are used, extrapolation must be approached cautiously.

The model estimated average city prices for the 269 stations in the data base. Actual gasoline prices were available for 581 stations, but variable data were not. The model came within one tenth of a cent of estimating actual average statewide prices. Estimated city prices did not differ by more than 2 cents from reported average city prices.

[4] At an estimated average use of 635 gallons per year, Washington State Department of Transportation. Forecast of Fuel, Vehicles, and Related Data.

Seventy percent of modeled station prices were within 2 cents of actual prices, and 50 percent of modeled station prices came within 1.3 cents of actual prices. After extensive analysis of more than 150 candidate variables, eight factors in combination were found to explain about 80 percent of the variation in average prices. In statistical terms, this is a strong or robust finding. The key reasons for different prices include:

- The cost of transporting gasoline from refineries to stations
- Market demand for gasoline, measured as vehicles per square mile
- Whether or not a station is located within 30 miles of the Canadian border
- Dealer margin
- Retail sales volume
- Whether or not a station offers a discount for cash
- Whether a dealer is supplied by an oil company or a distributor
- Average wholesale price

In the model, the combination of these variables determined the price of each station and an average city price. Each city had a different makeup for each variable, which led to different prices for each city.

The Variables

Transportation Costs

Gasoline transportation costs were calculated as the cost of moving the last required gallon from a refinery to a station through a delivery system, be it pipeline, barge, or truck. Monthly transportation costs were provided by pipelines, shippers, and the Utilities and Transportation Commission. We used marginal costs in our model because they more accurately reflect the way the market works. However, the difference between calculated marginal and average transportation costs is not large, and both affect price. Our model indicates that a 1 cent per gallon increase in the cost of transportation results in a third of a cent increase in average retail price, other determinants of price keeping it from being a one-to-one correlation. Stations located further from refineries and terminals tend to have higher prices, as do stations that rely on pipelines more often at capacity.

Dealer Margins

Dealer margins are the difference between a retail price and a dealer's buying price. Retail price data were collected monthly. Dealer buying price data were collected quarterly and averaged for the 12-month study period. Margins were calculated from data supplied by dealers. Dealers with larger margins tend to have higher prices. Our model indicated that a 1 cent per gallon increase in dealer margin translates on average to about a 0.4 cent increase in retail price, again other determinants of price keeping it from being a one-to-one correlation. Dealer margin is not correlated strongly with sales volume. It therefore suggests either higher costs or profits. We surveyed dealers about costs and profits and did not receive sufficient response to determine the causes of margin differences. It may be that dealer margins are underestimated because they do not include supplier discounts. We have adjusted for this potential deficiency by adding a supplier discount factor. While exact discount terms and amounts were not available, we did receive information on which stations receive them.

Sales Volume

Average station sales volume data were collected quarterly through surveys, but monthly data were

provided. Higher sales volumes are associated with lower prices.

Market Demand

Market demand was measured by the density of vehicles in a market area (vehicles per square mile). The total number of cars and trucks in a county were divided by the total number of square miles in all cities in the county. In smaller markets, with lower vehicle densities, retail prices are higher.

Cash Discounts

Stations either offer a discount for cash or not. The information was gathered through the quarterly surveys. According to our model, stations offering cash discounts have prices averaging 1.6 cents per gallon lower than stations without discounts.

Proximity to Canada

As with cash discounts, a station is either within 30 miles of Canada or it is not. While the choice of this distance was somewhat arbitrary, the evidence suggests that stations within this range post retail prices averaging almost 2 cents higher than stations further away.

Supplier Identity

This variable indicates whether or not a station is directly supplied by oil companies. The other supplier option is a distributor. The variable specifies supplier only, and not ownership or operations status, which mayor may not be by an oil supplier. The information was collected through surveys. Stations supplied by distributors rather than oil companies tended to have higher prices-why is not clear. Many factors could be involved, including costs, profits or pricing.

Wholesale Prices

While distributor wholesale purchase prices are fairly easy to obtain, it is much more difficult to calculate the cost of gasoline to oil companies before they distribute it to their own stations-an internal wholesale price. Instead of attempting to calculate this for oil companies, we calculated average wholesale prices, which did not distinguish between distributor buying prices and oil company buying prices. To calculate these prices, we subtracted transportation costs from dealer buying prices. Higher wholesale prices lead to higher retail prices.

Unexplained Variation

Any model has unexplained variation, which is most often due to factors one has been unable to define or collect information about. It can also result from incomplete data or errors in data supplied. However, it is rare for unexplained variation to dramatically alter a model. It is usually possible to adjust a model, add a variety of variables, and reduce variation, but the result may compromise common sense or the ability to explain how the model works.
For this study we relied on voluntary disclosure without incentives-we cannot expect complete data on all variables. For example, while we know dealer margin is an important variable, some stations have provided only a month or two of information. Continuity in reporting and more complete data may allow reductions in unexplained variation.

Model Results

The model estimated average unleaded self-service gas prices from eight variables that are statistically related to gas price. To compare results for different cities, we aggregated the individual stations and their average characteristics. Cities or groups of cities can be compared. We compared the Seattle metropolitan area against other west-side cities and against east-side cities.

General Market Variables

Three general market variables - transportation costs, market demand, and proximity to Canada - account for approximately one third of the variation in prices between stations.

Transportation is the most important explanatory variable in the model. It explains about 20 percent of the variation in prices statewide. Given that most gasoline is consumed on the west side, this can be misleading. Transportation accounts for about 14 percent of the variation between Seattle and west-side cities, but nearly twice as much of the variation (27 percent) between Seattle and east-side cities. This stands to reason, given the higher cost of delivering gasoline inland.

> Seattle has the lowest gas transportation costs west of the Cascades. Bellingham and Vancouver are slightly higher, but both are below the state average. Bellingham transportation costs may strike some as surprising. The city is near the state's major refineries, but has slightly higher transportation costs because it is more expensive to truck gas from Anacortes than to move it by pipeline from refineries to Seattle. Port Angeles has the highest transportation costs in the study, reflecting its distance from terminals. Gasoline cannot be ferried.
>
> On the east-side, cities rely on pipelines that are often constrained. As a consequence, stations often pay higher marginal rather than average transportation costs. These cities are also further from refineries and terminals. West-side markets served by the Olympic pipeline rarely face capacity constraints.

The size of the local market for gasoline is another important factor that explains about 9 percent of statewide price variation. With the predominance of the west-side market, this value can again mislead the casual reader. It explains about 14 percent of the variation between Seattle and other west-side cities, and 27 percent of the difference between Seattle and east-side cities.

> Vancouver has the highest vehicle density in the study, followed by Seattle. This helps to account for low gas prices, since this demand is instrumental in ensuring healthy market competition. Aberdeen, Ellensburg, and the Tri-cities, on the other hand, all have low vehicle densities and concomitant higher prices.

Gas transport cost and market demand together explain about 55 percent of the variation in price between Seattle and east-side cities.

Statewide, proximity to Canada explains about 4 percent of the variation in prices. Because no cities in our model on the east side are within 30 miles of Canada, this variable explains none of that price variation. However, it explains about 19 percent of the variation when comparing west-side cities with Seattle. Markets in Port Angeles and Bellingham are evidently responsive to higher Canadian gas prices. These cities are major stopping points for Canadian and U.S. tourists; many understandably prefer to refuel in the U.S.

Retail Market Variables

Three retail market variables-dealer margins, sales volumes, and cash discounts-explain just over 40 percent of the variation in prices between stations.

Dealer margins are the second strongest variable in the equation, explaining about 18.5 percent of statewide variation. Margin accounts for slightly more (22 percent) of the difference when Seattle is compared to other west-side cities. For inland cities, dealer margin accounts for 17 percent of the difference with Seattle.

> Port Angeles reported the highest dealer margins in the study, closely followed by Ellensburg. In the preliminary report, Wenatchee reported the highest dealer margins. Wenatchee now reports the lowest margins. Clarkston and Seattle are also quite low. This suggests that dealer margins vary considerably. This variation may result from unusual market pressures generated by the Persian Gulf War. In many cases, stations were not able to raise prices to cover higher product cost, and may have had to reduce margin. It may be that margins do not vary in more stable periods. It may also be that market structure changes so quickly that it continually affects margins.

The third most important statewide factor is sales volume. It accounts for about 18.3 percent of variation. It is less important when comparing either east- or west-side cities against Seattle, explaining about 12 percent of the variation between Seattle and cities on either side of the mountains.

> Seattle stations have the highest sales volumes, averaging some 115,000 gallons per month. The next highest average volumes are in Yakima, where stations average 90,000 gallons per month. Port Angeles, Aberdeen, and the Tri-Cities have the lowest volumes, averaging 40,000 to 45,000 gallons per month.

Discounts for cash account for about 4 percent of the variation in prices statewide. The variable explains almost none of the variation in price between Seattle and other cities, indicating that Seattle is not much different from other cities in this respect.

Wholesale Market Variables

Two wholesale market variables-type of supplier and average wholesale prices-account for about 4 *percent of the variation in prices between stations.*

Whether or not a station is supplied by an oil company or a distributor is more important when comparing other cities to Seattle than it is when comparing all stations on a statewide basis. Statewide, this variable accounts for less than two percent of variation. It explains 16 percent of the variation between Seattle and west-side cities, and 12 percent of the difference between Seattle and east-side cities. This increase results from the fact that Seattle has fewer distributor supplied stations, which tend to have higher prices.

In our draft report, this variable accounted for 10 percent of the statewide variation-far above the 2 percent calculated in the final model. It also explained 55 percent of the difference between Seattle and other cities. This difference has fallen to 16 percent (west side) and 12 percent (east side). Both of these are significant reductions. We attribute the change to two factors-the longer period of study and the use of a variable reflecting proximity to Canada. The draft report was based on data accumulated during the crisis and Persian Gulf War. As one might expect in times of surplus, differences between oil company

supplied stations and distributor supplied stations are less easily maintained. Furthermore, the addition of the Canadian proximity variable has reduced the power of the distributor variable. This means that the supplier variable may have been reflecting geographic information that is better reflected in a true geographic variable.

> Most cities are served by both company and distributor supplied stations. Seattle stations are about 90 percent supplied by oil companies. This has resulted in lower prices. Ellensburg is also heavily supplied by oil companies (70 percent). On the west side, Bellingham and Port Angeles are more heavily served by distributors than oil companies. Clarkston and Tri-Cities are also more heavily served by distributors on the east side.

Average wholesale prices explain about 2 percent of the variation in prices statewide, and a similar amount of the variation between Seattle and other cities.

Chapter 3

PREVIOUS GASOLINE PRICING STUDIES

This chapter describes other studies and explains how WSEO's methodology, data, and results differ.

1986 Report to the Legislature on the Retail Gasoline Market, Washington State Senate Select Committee on Petroleum Marketing Practices, Senator Stuart Halsan, Chairman, 1986: This study investigates allegations of unfair business practices by oil companies. The study uses oil company supplied sales data and testimony to find "a definite increase in presence and market share of major refiner company operated stations...an increase of over 300 percent since the time of deregulation."[5] As a consequence, the committee recommends enactment of legislation to protect independent dealers.

WSEO's study differs significantly from the Senate study by relying almost entirely on data and only in general on testimony. While independent dealers may fear market concentration, our study did not show that concentration, alone, is a major factor in explaining variations in price. It is also important to emphasize that WSEO's study was not intended to investigate the business practices of oil companies, but simply to determine what combination of factors leads prices to vary between cities.

Report on the Spring 1989 *Gasoline Price Increase in Washington State, Washington State Attorney General, Antitrust Division, September* 1989, *and Report on Gasoline Pricing in Washington State After the 1990 Invasion of Kuwait, Washington State Attorney General, Antitrust Division, August, 1990:*

Similar to the Senate study, studies by the Attorney General (AG) are generally done for the express purpose of determining the fairness of oil markets in Washington.

The 1989 report was ordered by the legislature to determine whether the wreck of the Exxon Valdez caused the price surge. The study found that the accident, rather than being the direct cause of the price surge, was more of a catalyst that exacerbated already present market forces that were pushing prices higher. The report "neither confirms nor rejects allegations of collusion."[6] The AG's 1989 study methodology compares retail price movements in Seattle with crude and wholesale price movements to show changes in retail or wholesale margins. The AG's 1990 study uses the same methodology and produced similar findings.

What the AG's studies do not do, and what our study does primarily, is to demonstrate how the structure of markets in individual cities affects prices. WSEO's study explains why prices are relatively different between cities and how statewide price changes may be reflected differently from city to city. Our database can provide the same information as the AG studies provide for 10 additional cities or metropolitan areas. The AG studies may have led to legislation written by the Washington State Attorney General recommending price controls on margins made by wholesale and retail marketers. Both Senate and House versions of the legislation died in committee in February 1991.

Arizona Motor Fuel Price Differentials, Arizona Department of Commerce, Energy Development and Utilization Division, December 1989: The Arizona study covers a period of 2 years and looks at 10 Arizona cities. It was designed to answer a question similar to the one asked of WSEO, "why do prices differ between cities in Arizona?"

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[5] 1986 Report to the Legislature on the Retail Gasoline Market, page 5.
[6] Report on The Spring 1989 Gasoline Price Increase in Washington State, page 2.

Though the goal of the studies is the same, the methodology used is quite different. In the Arizona study, expected prices and margins were calculated for each city based on researched wholesale prices, transportation costs, and operating margins. These expected values were then compared to collected actual prices. A retail survey and a distributor survey were used to build descriptions of individual city markets. Using market descriptions the study drew inferences for why actual prices do or do not compare with expected values. Our study also collected actual price and market structure data. However, instead of drawing inferences for why prices differ from expected values, market structure data were used as variable constructs in a statistical model to explain the variation in prices. Market variables that significantly explained price differences, and the effect they have on prices, are identified.

The Arizona study attempted to explain prices in Tucson and Phoenix on the basis of supplier prices in El Paso and Los Angeles, and found a significant correlation. The Arizona study also found an increasing concentration of market share in the hands of majors, and implications in the data that wholesale pricing may be becoming less competitive. This has raised the general concern that having fewer companies may lead to less competition should the trend continue. The study recommended funding studies to examine divorcement and uniform pricing legislation and implementing policies designed to promote the economic well-being of rural Arizona.

Some specifics in data collection also differentiate the Arizona and WSEO studies. The Arizona retail survey produced a response rate of 34.8 percent out of 135 surveys mailed. Several cities had response rates too low to report results, to protect proprietary information provided by respondents. The Arizona distributor survey produced a response rate of 27.6 percent out of 134 mailed. In comparison, WSEO received 66 percent of surveys mailed to approximately 750 dealers and 66 percent of surveys mailed to approximately 200 distributors. We mailed the surveys during the summer, fall, winter, and spring of FY 1991, for a total of approximately 3,600 surveys mailed.

An Economic Study of the Washington Petroleum Market, Purdue University, Krannert Graduate School of Management, Umbeck, John, PhD. and Barron, John, PhD., 1989: This study is included in a four-study package produced for a consortium of Washington marketing oil companies in response to the petroleum market regulating Initiative 112. Along with efforts to demonstrate why Initiative 112 would not benefit Washington consumers, the study attempts to explain the reason for differences in prices between Washington cities. In this respect the study's goal is the same as WSEO's.

The Purdue study differs from our study in several respects, most importantly in study period. The Purdue study collected data over a 2 week period; WSEO collected data over a 15-month period. According to the Purdue study, that 2 week period was not a normal period for oil marketing in the state because pipelines were at capacity or down for maintenance. The Purdue model did not have wholesale purchasing data for dealers who were not oil-company supplied stations, nor were oil companies required to provide invoices with which their dealer wholesale purchases could be verified. Our surveys requested and received wholesale purchase data and invoices from oil company supplied and distributor supplied stations. The Purdue study found that transportation and dealer margin differences explained 75 percent of the difference in prices between Seattle and other cities in the state. Our study found the same variables explained 35 to 44 percent of the price variation between Seattle and other cities.

Chapter 4

SUPPORTING GRAPHS AND EXPLANATIONS

Chapter 4 is a collection of graphs with explanations supporting the analytical findings of the study. Graphs 1-8 give the results, variously aggregated, of collected prices. The remainder of the graphs supports the statistical model.

Graphs 9-14 display the model, overall results and provide some argument for the strength of the findings. Graph 10 is the model, and Graph 14 provides the best visual display for understanding the reasons for differences in gasoline prices between stations and cities in Washington.

Graphs 15-24 display the variable characteristics used in the model for each city and allows the reader to compare variable characteristics between cities.

Graphs 25-31 deal with the differences in prices between Seattle and other cities in the state. Graph 26 provides the best visual display for understanding the reasons for price differences between Seattle an other cities.

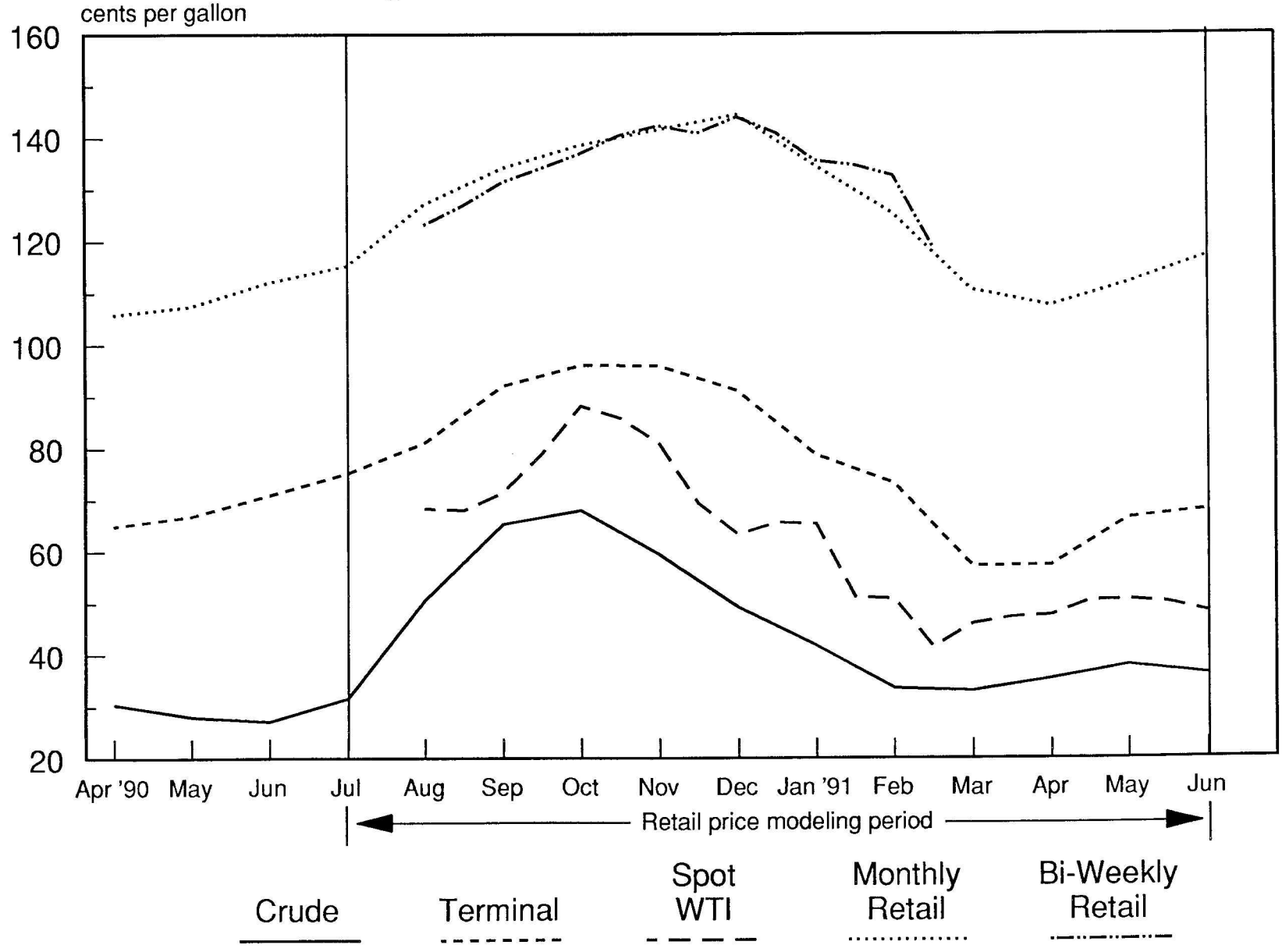
Graph 1

Washington State
Average Crude, Wholesale and Retail Prices

- No apparent anomalies in pricing on average
- Some price lag is evident in downstream wholesale and retail pricing

Graph 1

Washington State
Average Crude, Wholesale and Retail Prices



Note: Retail price is unleaded regular self service cash. WTI = West Texas Intermediate crude oil sold at the NYMEX.

Source: WSEO Petroleum Prices Database

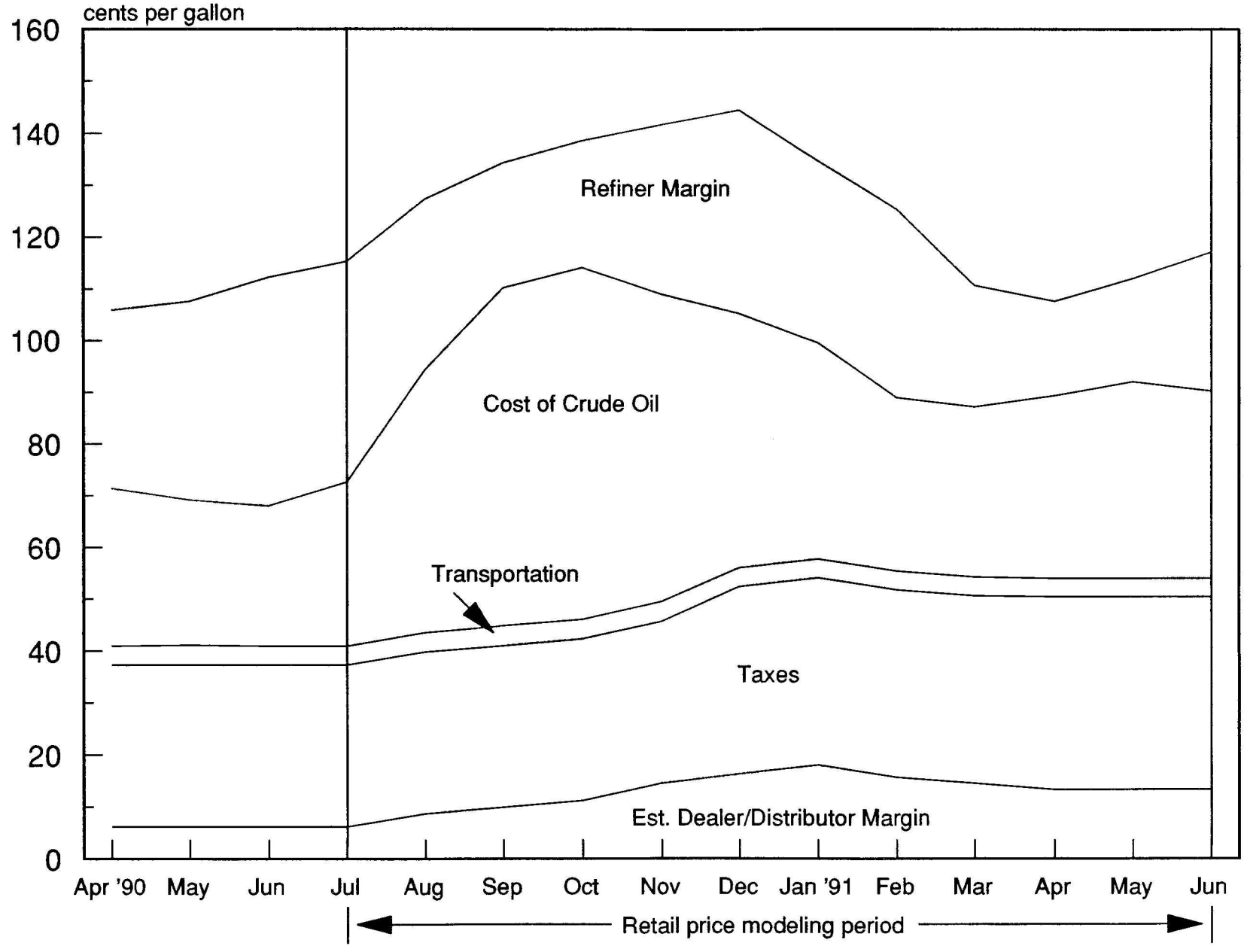
Graph 2

Washington State
Average Retail Price Breakdown

- Federal tax increase in December 1990
- State tax increase in April 1991
- Estimated Dealer/Distributor margins were significantly larger in January

Graph 2

Washington State
Average Retail Price Breakdown For State



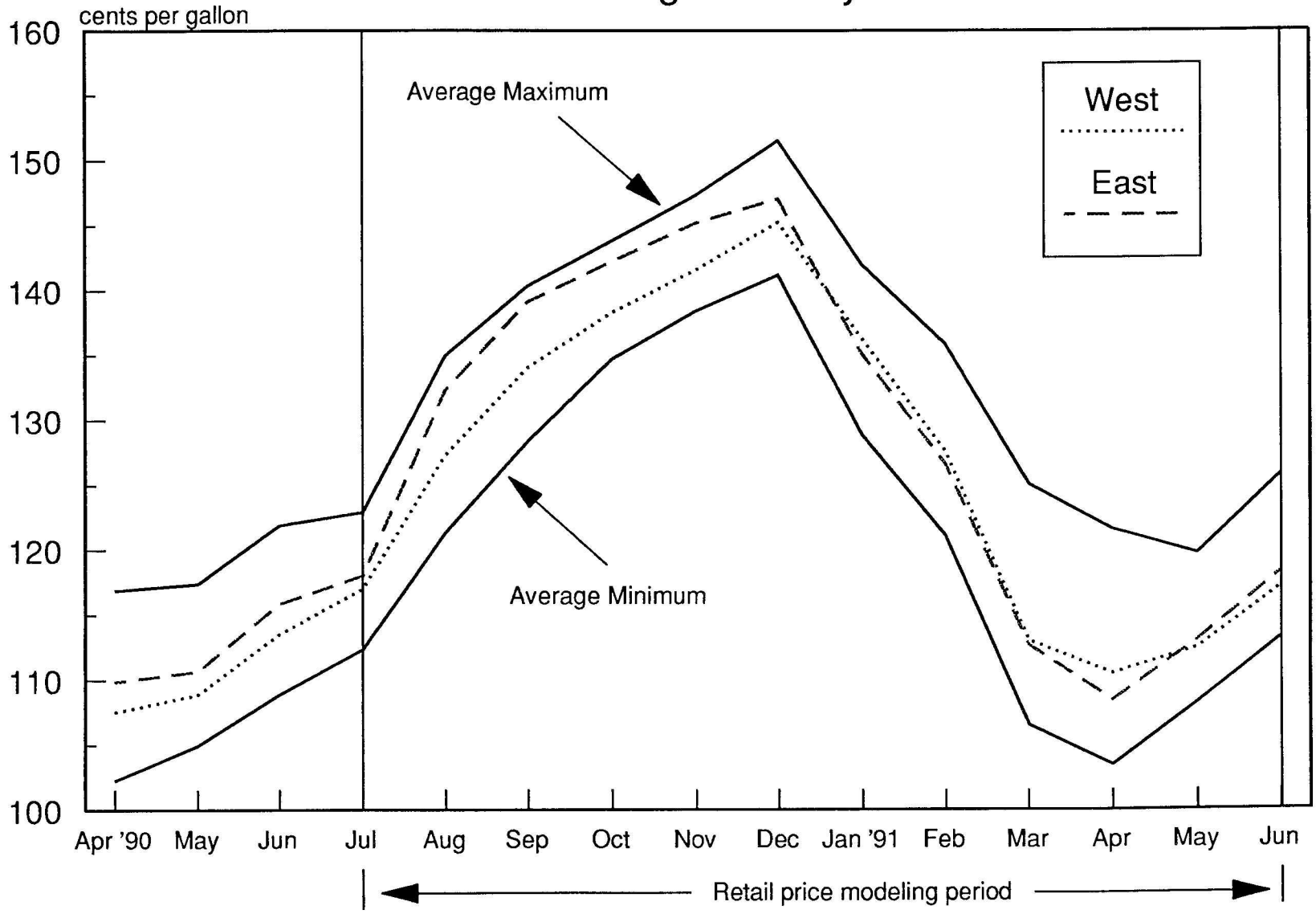
Source: WSEO Petroleum Prices Database

Graph 3

Retail Gasoline Prices Ranged an Average Of 12.8 Cents during the Study Period

- The average price range was small – pennies are important in the analysis
- No cities or time periods with prices that stood out as extreme
- Seattle was always close to the minimum

Graph 3 Retail Gasoline Prices Ranged an Average of 12.8 cents During the Study Period



Note: East and West prices are average city prices in cities East and West of the Cascades.

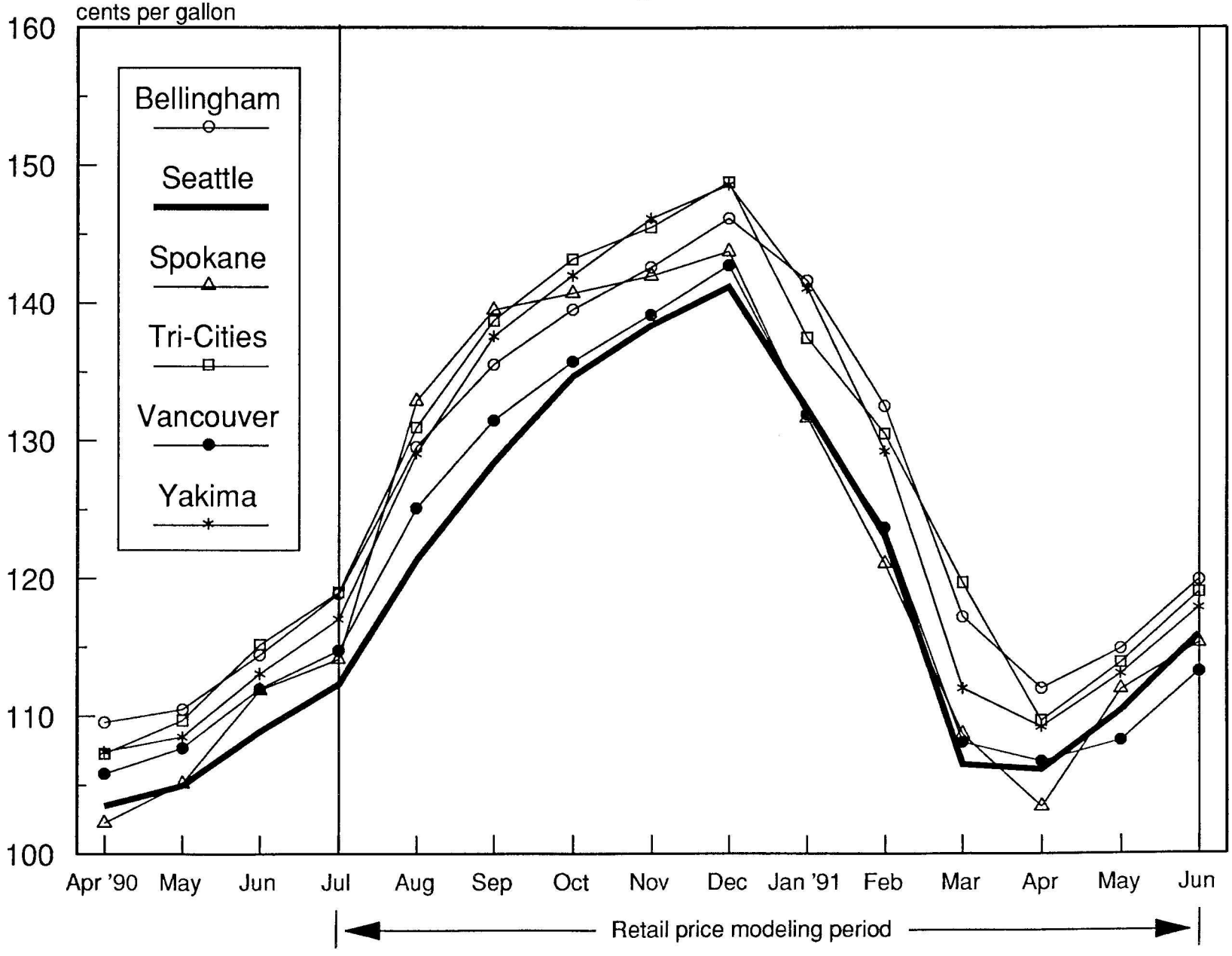
Source: WSEO Petroleum Prices Database

Graph 4-7

Average Retail Prices in Large Cities, Small Cities, Western and Eastern Washington

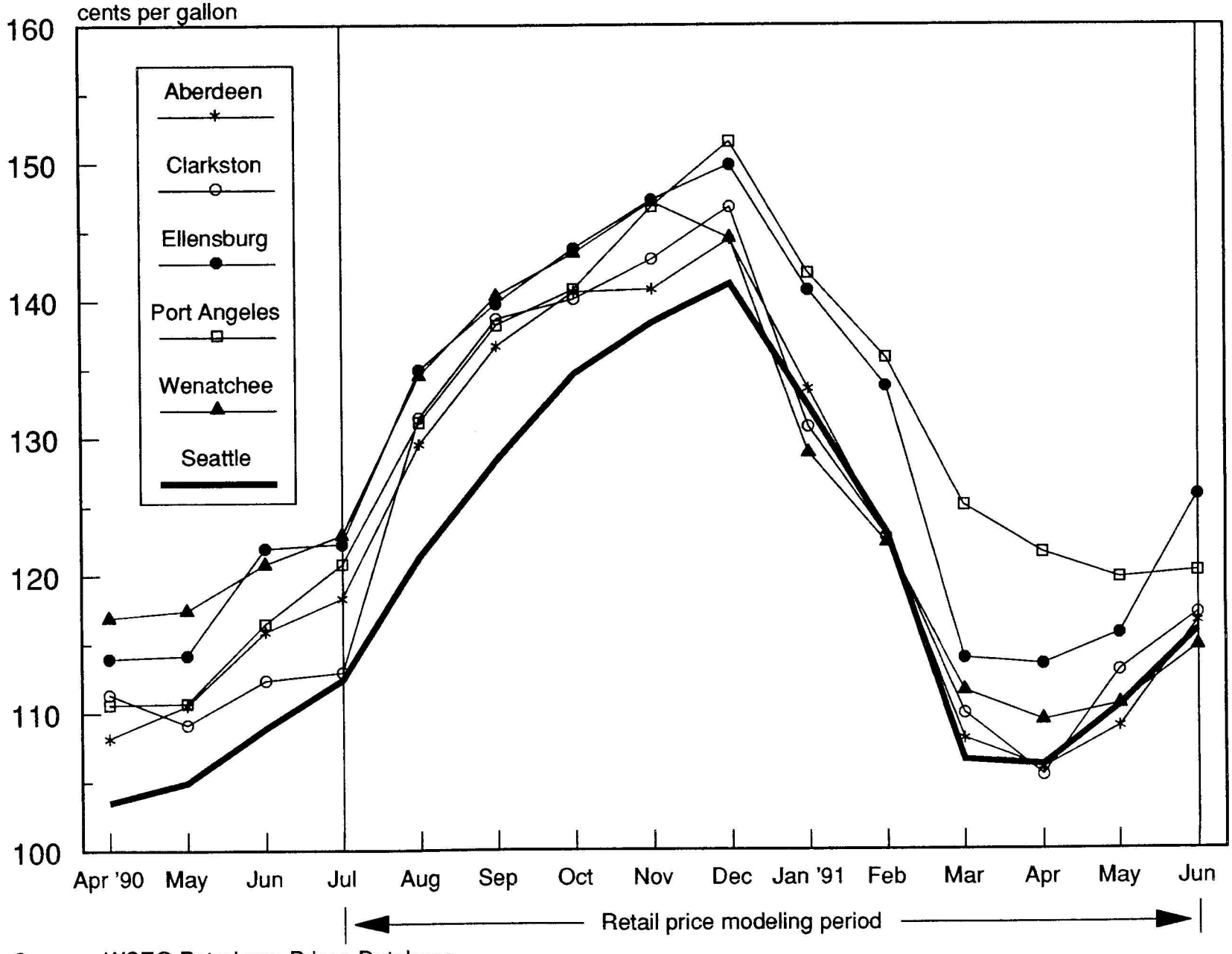
- Retail gasoline prices in Seattle tended to be lower than all other areas in the state

Graph 4 Retail Gasoline Prices In Seattle Tended To Be Lower Than Other Large Cities



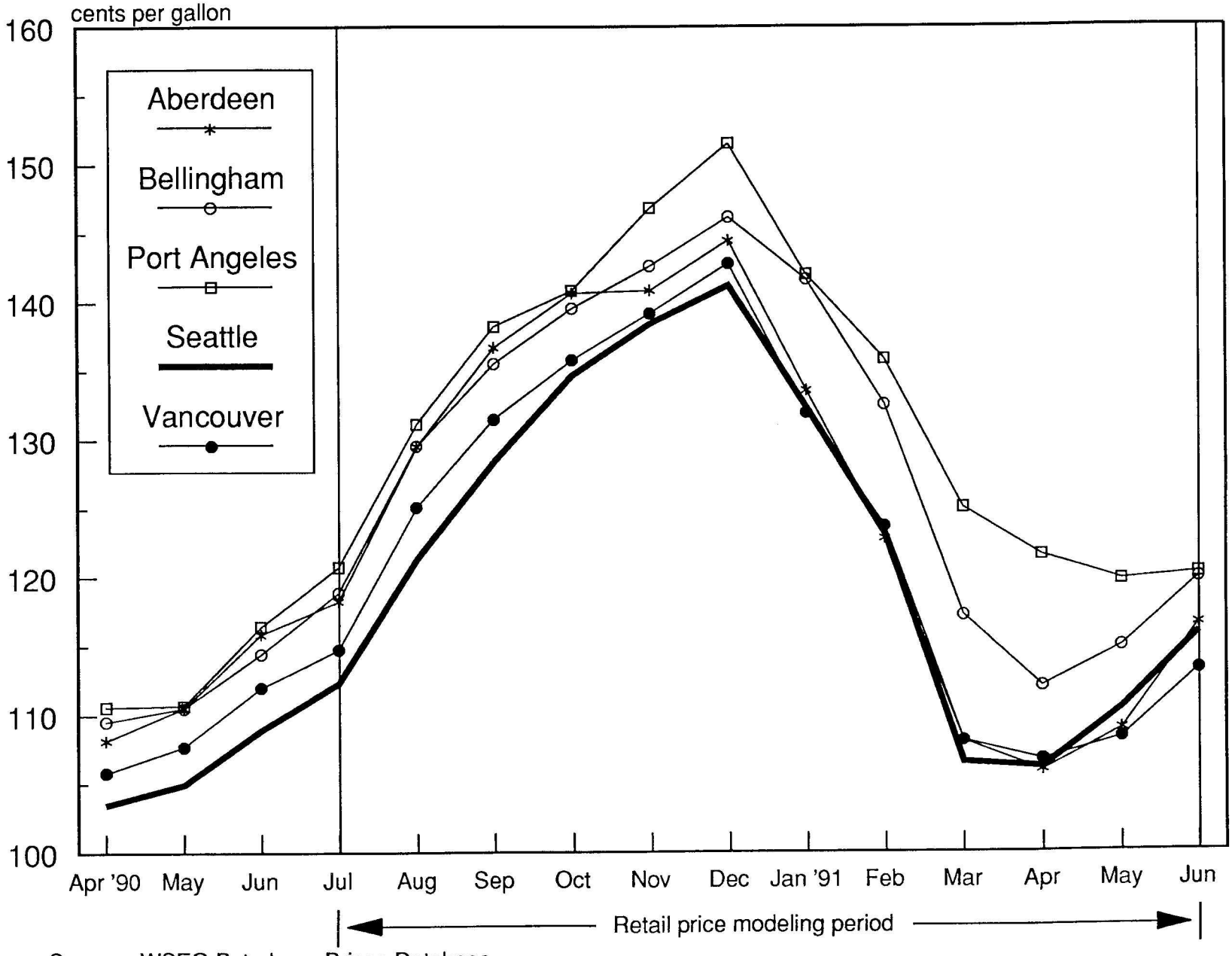
Source: WSEO Petroleum Prices Database

Graph 5 Retail Gasoline Prices In Seattle Tended To Be Lower Than In Small Cities



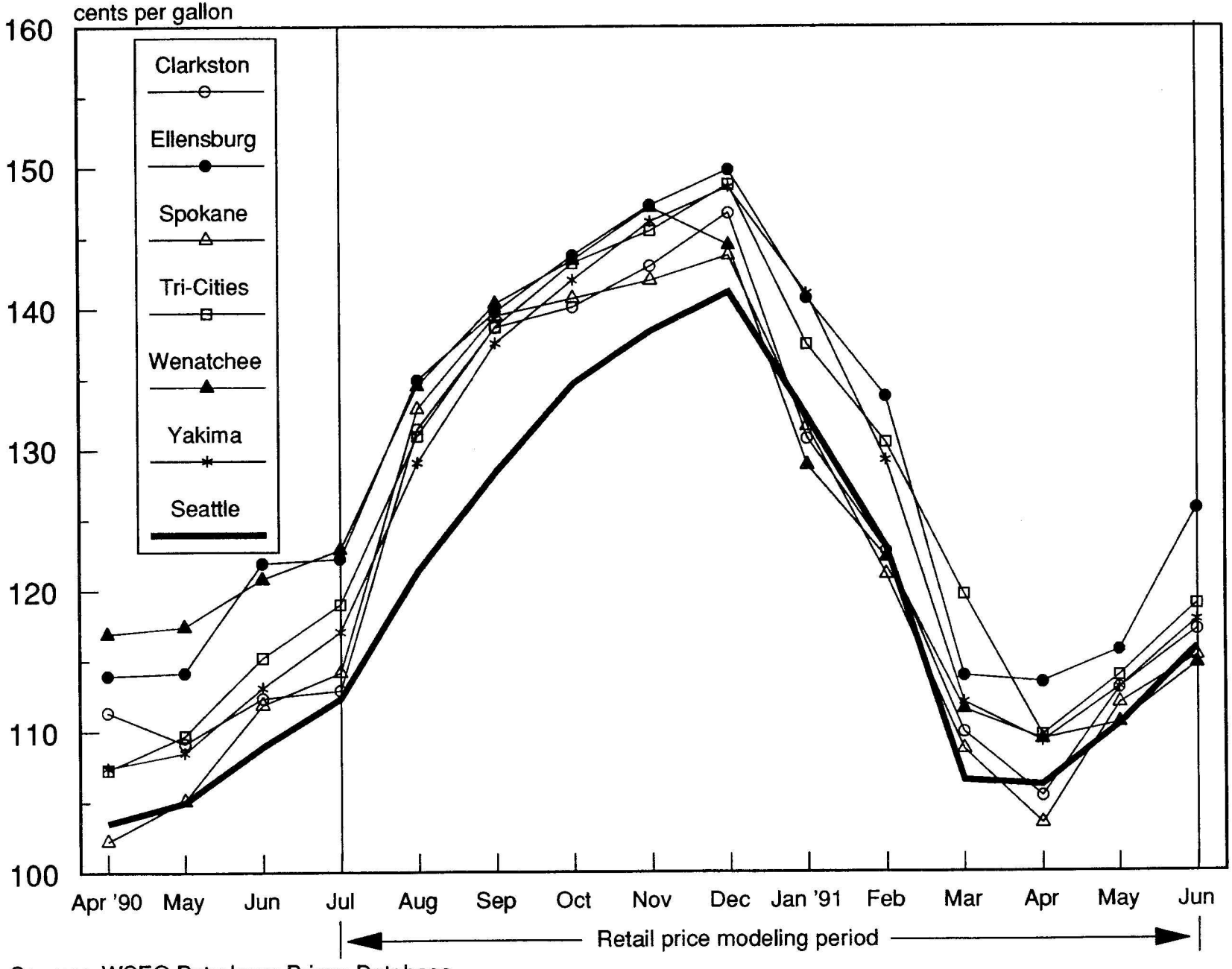
Source: WSEO Petroleum Prices Database

Graph 6 Retail Gasoline Prices In Seattle Tended To Be Lower Than Western Washington



Source: WSEO Petroleum Prices Database

Graph 7 Retail Gasoline Prices In Seattle Tended To Be Lower Than Eastern Washington



Source: WSEO Petroleum Prices Database

Graph 8

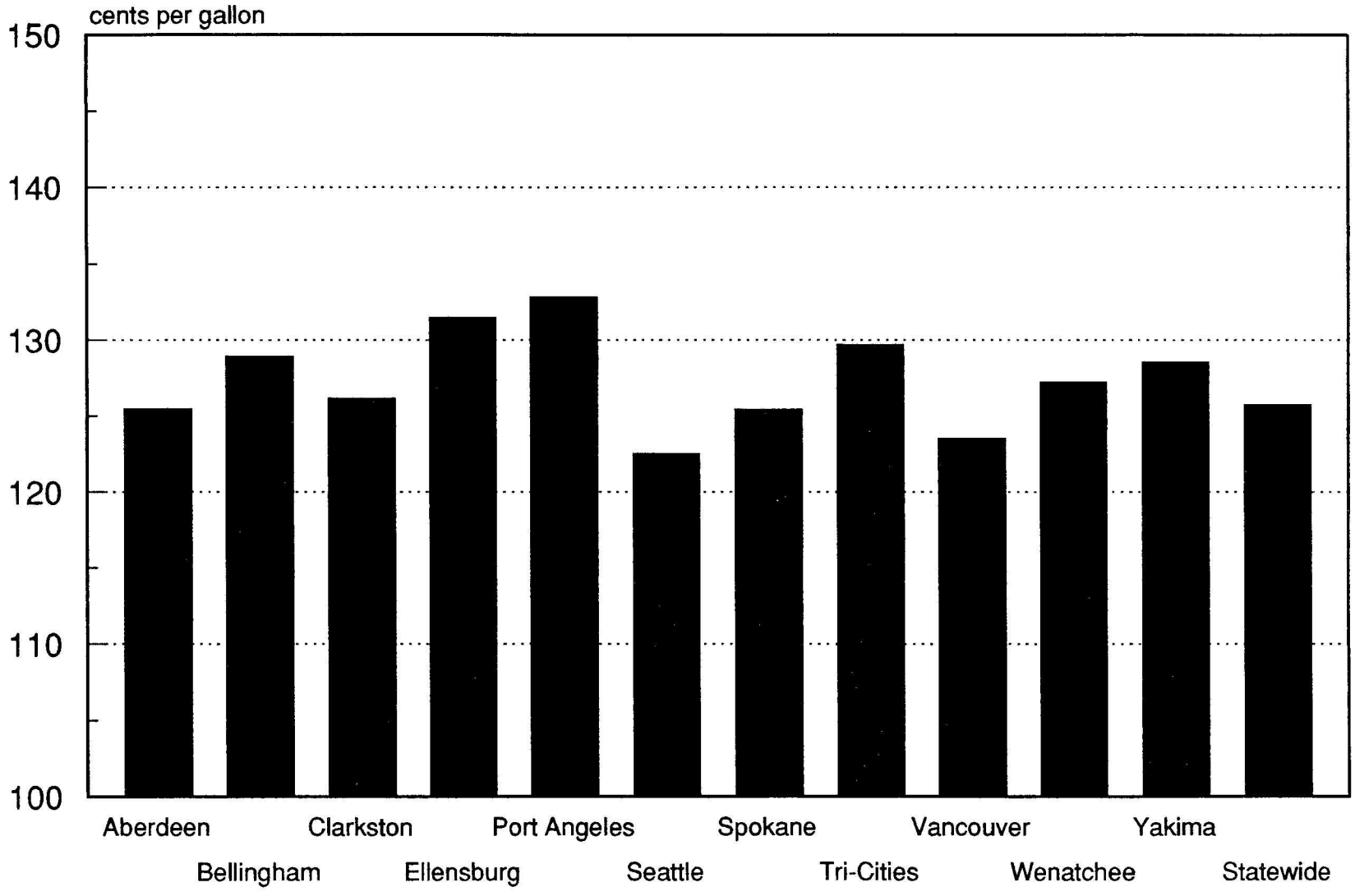
Average Unleaded Self-Serve Cash Gasoline Prices

- The WSEO study looked at average unleaded self serve cash gasoline prices
- Significant average price differences during the study were evident

Graph 8

Average Unleaded Self-Serve Cash Gasoline Prices

(7/1990 to 6/1991) (Sample Size = 581)



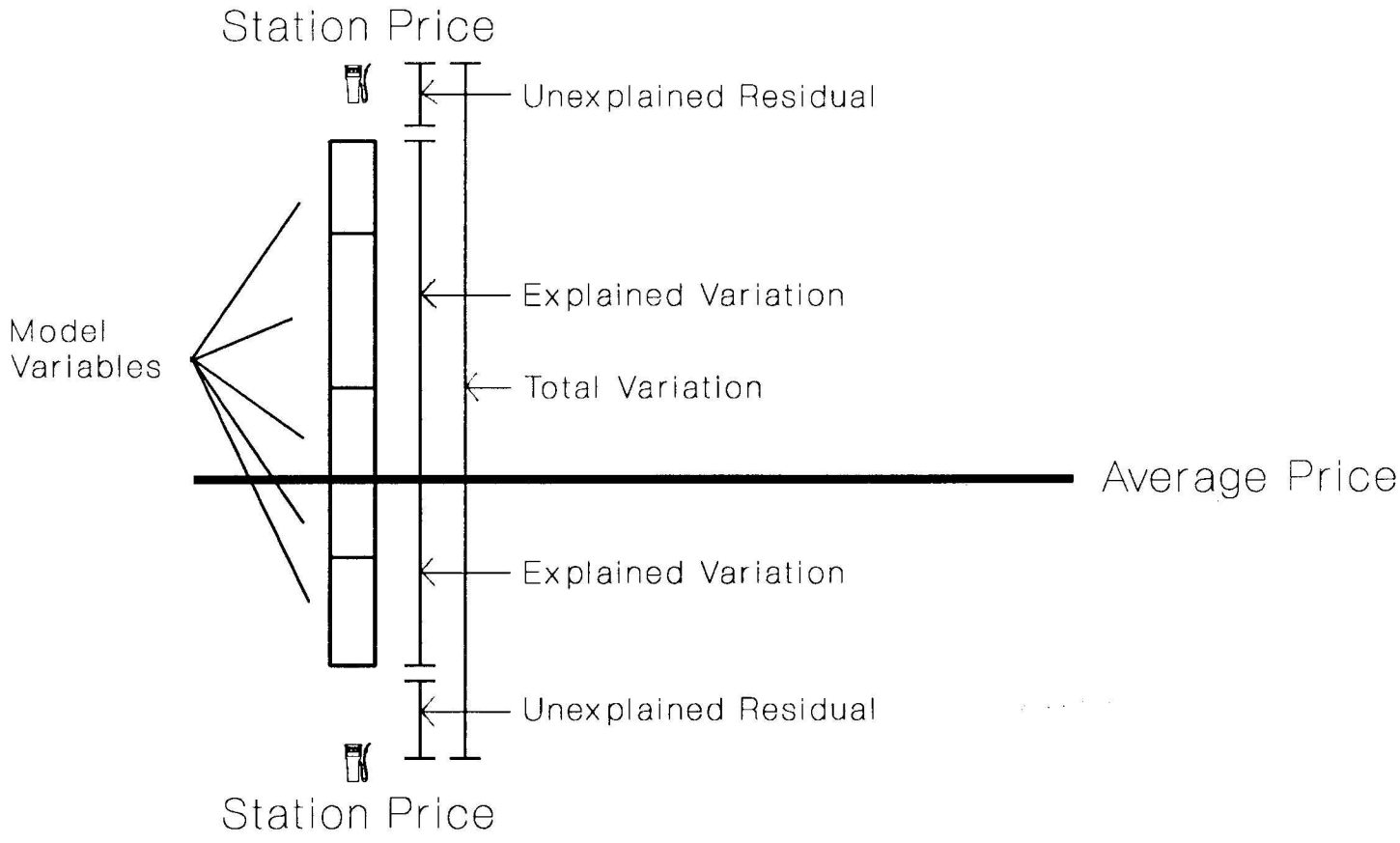
Source: WSEO Petroleum Prices Database

Graph 9

Explaining Variation

- Graph 9 indicates how the variation in average retail prices may be explained by variables in the WSEO prices model
- The unexplained residual is the variation which cannot be explained by the model variables
- The WSEO prices model explains 78% of the total price variation

Explaining Variation



Graph 10

WSEO Gasoline Prices Model

- 269 stations are included in the model. Each station has complete data.
- WSEO model explains 78% of price variation (Adjusted R-Square).
- Eight variables are included in the model:
    - Total marginal transportation costs
    - Dealer margins
    - Sales Volumes
    - Vehicle density (proxy for demand intensity)
    - Discount offered for cash sales
    - Proximity to Canada
    - Oil Company or Distributor Supplied
    - Estimated Wholesale Prices
- The coefficient identifies the effect of the variable on the price of gasoline. For example, a one cent per gallon increase in transportation cost leads to a .329725 cent increase in the unleaded price. If a station is within 30 miles of Canada the price of gasoline is 1.876056 cents greater.

WSEO Gasoline Prices Model

Number of Observations	269
Adjusted R-Square	0.7765

Variable	Coefficient	Standard Error	T	Significance
Constant	119.623	3.599983	33.229	0.000
Transportation Cost (cents/gallon)	0.329725	0.676092	4.877	0.000
Dealer Margin (cents/gallon)	0.386846	0.028537	13.556	0.000
Monthly Sales Volume (log of gallons/month)	-1.04752	0.187302	-5.593	0.000
Vehicle Density (registered vehicles/urban area)	-0.00071	8.59E-05	-8.159	0.000
Cash Discount (cents/gallon)				
Yes	-1.63597	0.253875	-6.444	0.000
No	0	NA	NA	NA
Proximity to Canada (less than 30 miles)				
Yes	1.876056	0.402329	4.663	0.000
No	0	NA	NA	NA
Oil Co./Dist. Supplied				
Oil Company	0	NA	NA	NA
Distributor	1.60336	0.323814	4.951	0.000
Estimated Wholesale (cents/gallon)	0.122653	0.019536	6.278	0.000
Wholesale discount*				
Yes	1.013058	0.355039	2.853	0.005
No	1.782994	0.380828	4.682	0.000
NA	0	NA	NA	NA

* The wholesale discount variable is used to modify the dealer margins and is therefore combined with margins in the analysis.

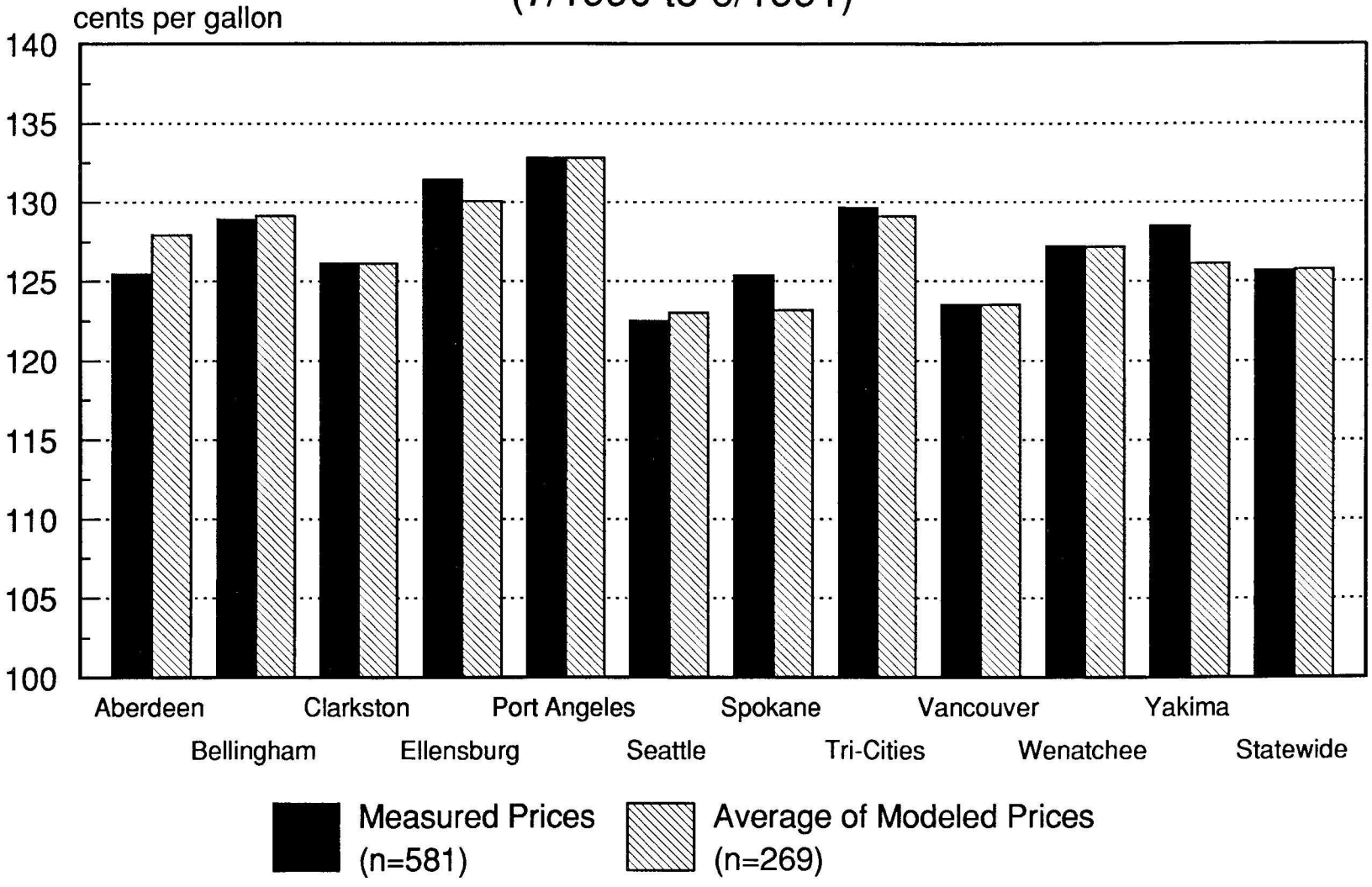
Graph 11

Measured vs. Modeled Unleaded Self-Serve Cash Prices

- State average gasoline price estimated to within .1 cent
- Relative price values between cities are nearly all preserved
- Estimated averages for each city are very close

Graph 11 Measured vs. Modeled Unleaded Self-Serve Cash Prices

(7/1990 to 6/1991)



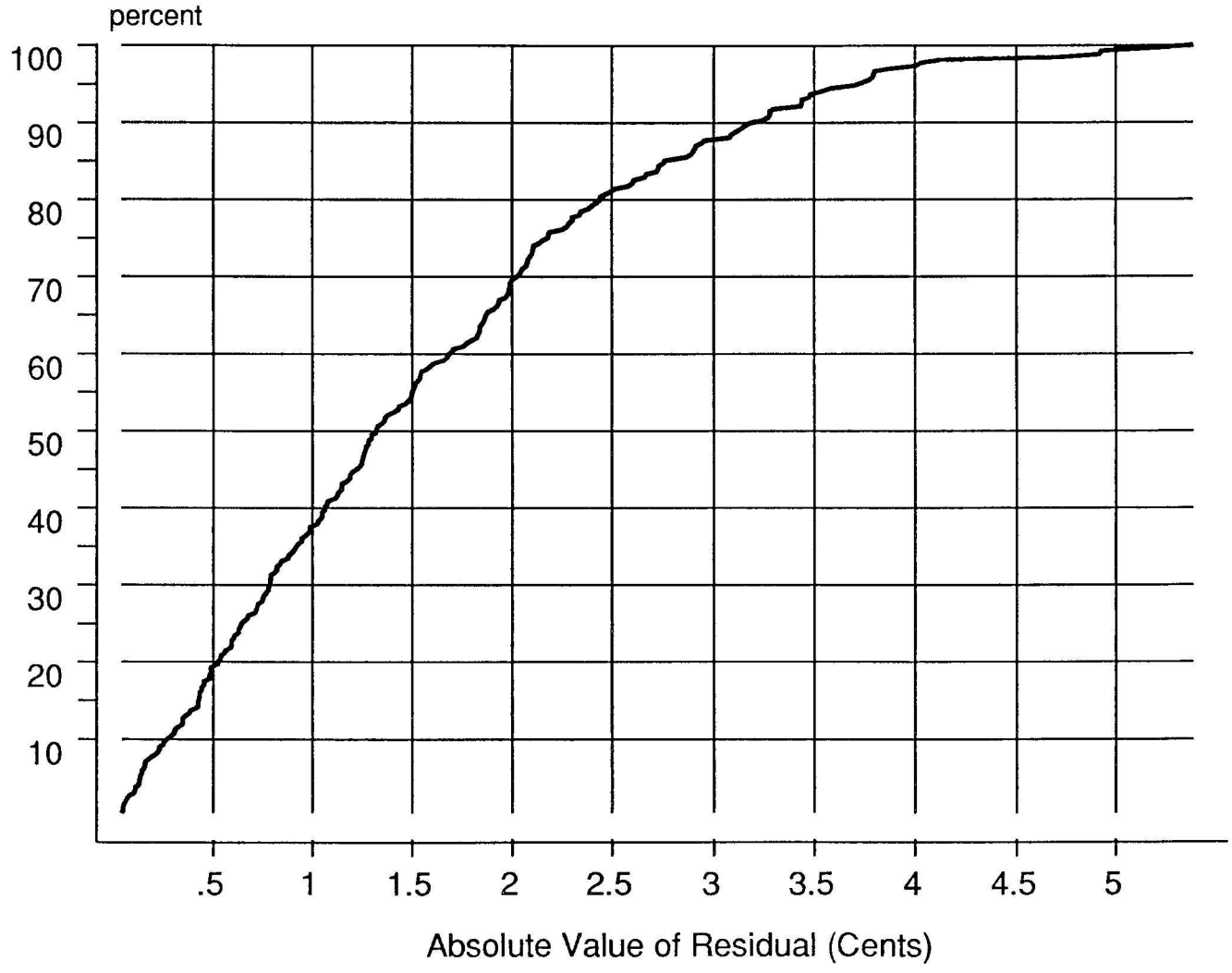
Source: WSEO Petroleum Prices Database

Graph 12

Cumulative Distribution of Absolute Residuals

- Residuals demonstrate the difference in modeled and measured prices by station
- Not only are city averages close, but ….
- 100% of the station prices are explained by the model within 5.5 cents
- 70% of the station prices are explained by the model within 2 cents
- 50% of the station prices are explained by the model within 1.3 cents

Graph 12 Cumulative Distribution of Absolute Residuals
(n=269)



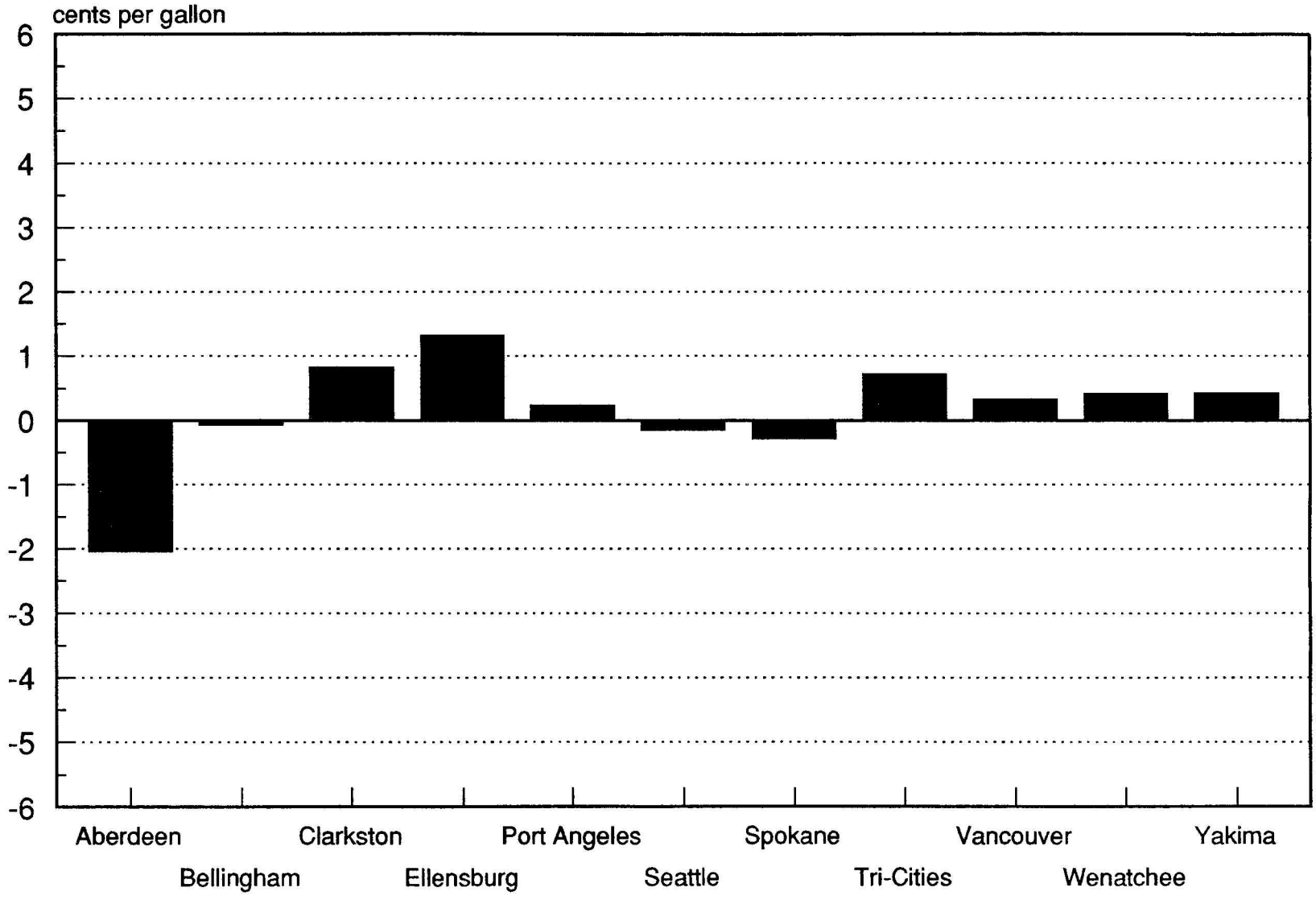
Source: WSEO Petroleum Prices Database

Graph 13

Average Residuals (price variation unexplained) From WSEO Gasoline Prices Model

- 7 cities have residuals less than .5 cents
- Only 2 cities have residuals larger than 1 cent
- No cities have residuals much greater than 2 cents

Graph 13 Average Residuals (price variation unexplained) From WSEO Gasoline Prices Model



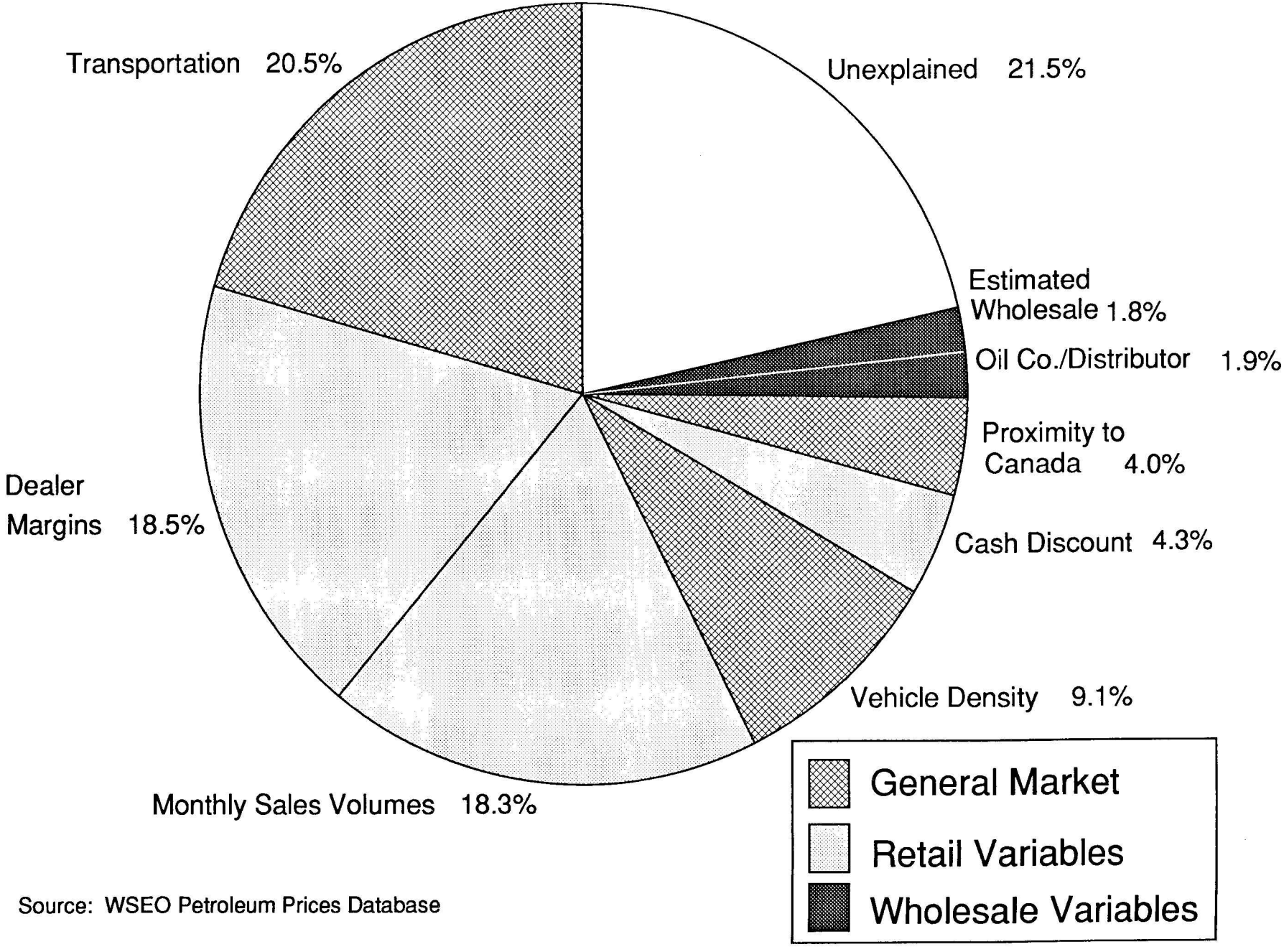
Source: WSEO Petroleum Prices Database

Graph 14

Components of Variation in Gasoline Price

- Graph indicates the statewide gasoline price variation explained by each variable in the WSEO prices model
- Retail market (dealer margin, sales, cash discount) explains about 40% of variation
- General market variables (transportation, vehicle density & proximity to Canada) explain about one-third of the variation
- Wholesale market explains 3.7% of variation
- 21.5% of variation remains unexplained

Graph 14 Components of Variation in Gasoline Price
(Average Unleaded Self-Serve Cash 7/90-6/91)



Source: WSEO Petroleum Prices Database

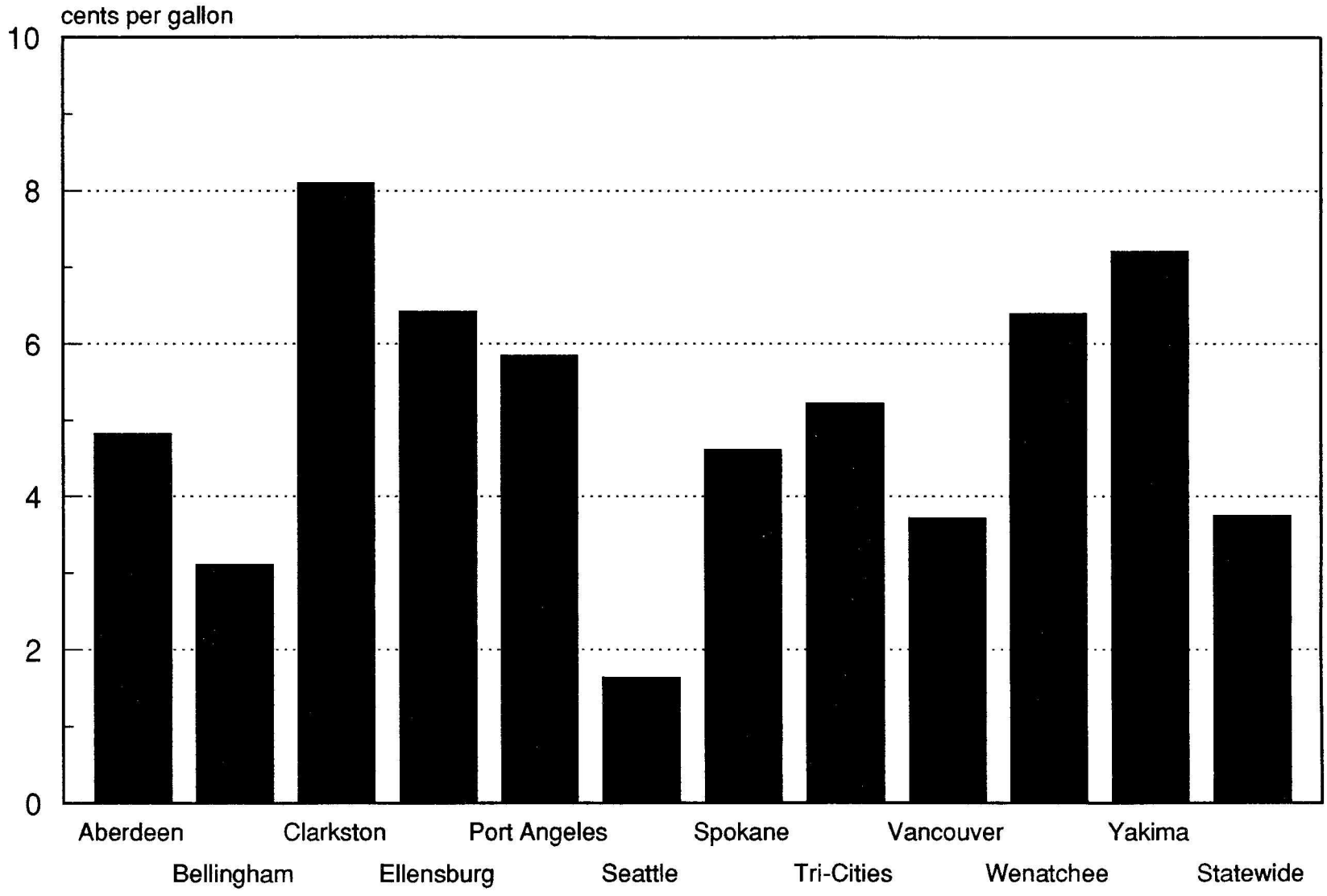
Graphs 15-24

Averages for the Variables included in the WSEO Model

- Graphs indicate what is pushing prices up or down in each city
    - Graph 15 – Higher transportation costs lead to higher prices
    - Graph 16-18 – Higher dealer margins lead to higher prices
    - Graph 19 – Higher sales volumes lead to lower prices
    - Graph 20 – Higher vehicle density leads to lower prices
    - Graph 21 – Higher numbers of stations offering cash discounts lead to lower prices
    - Graph 22 – Higher numbers of distributor supplied stations lead to higher prices
    - Graph 23-24 – Higher estimated wholesale price leads to higher prices

- Each city has a different value for each variable. The mix of values determines a city's relative price level

Graph 15 Total Marginal Transportation Costs By City

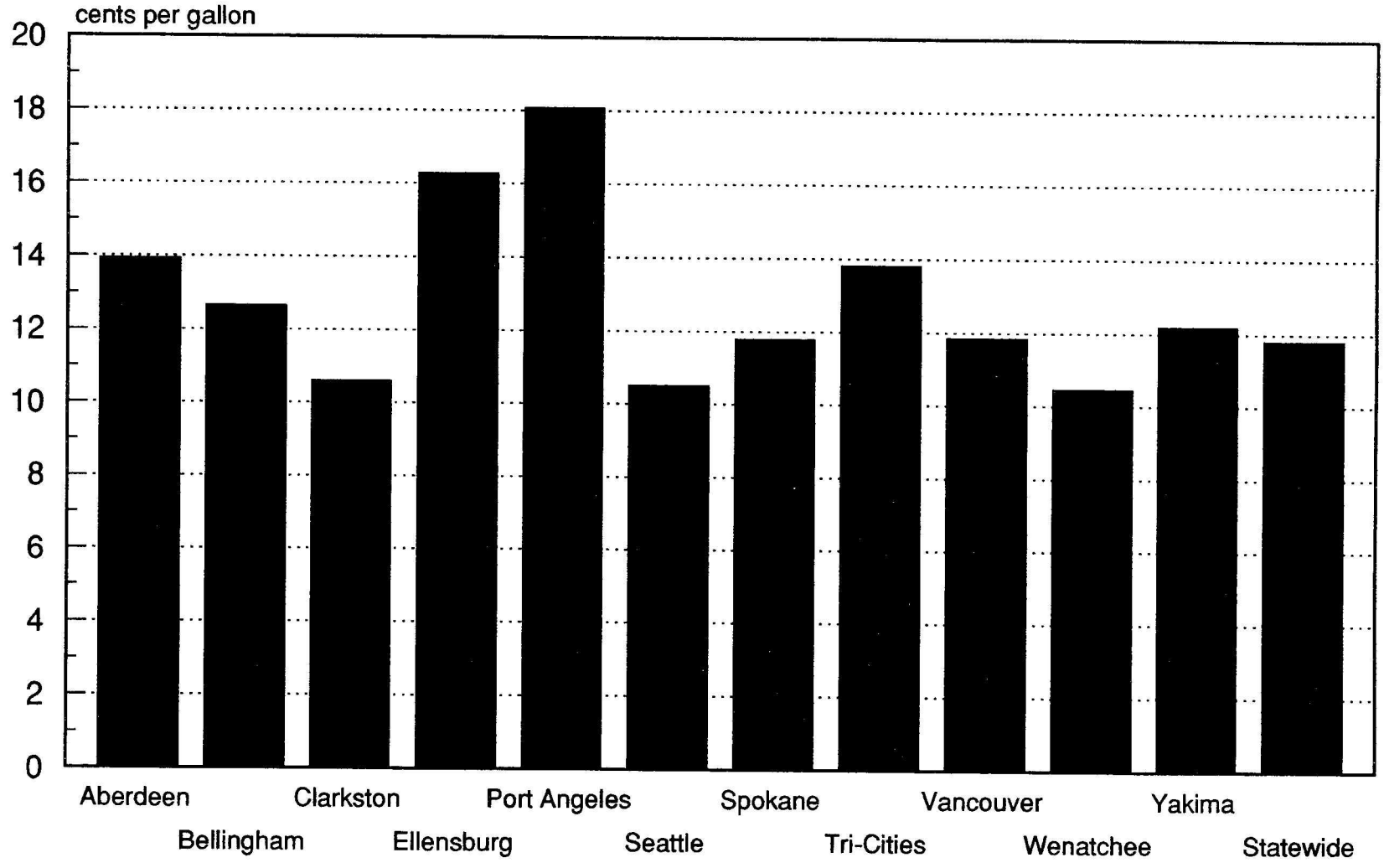


Source: WSEO Petroleum Prices Database

Graph 16

Average Dealer Margins

Average of Margins for October 1990, January 1991 and April 1991

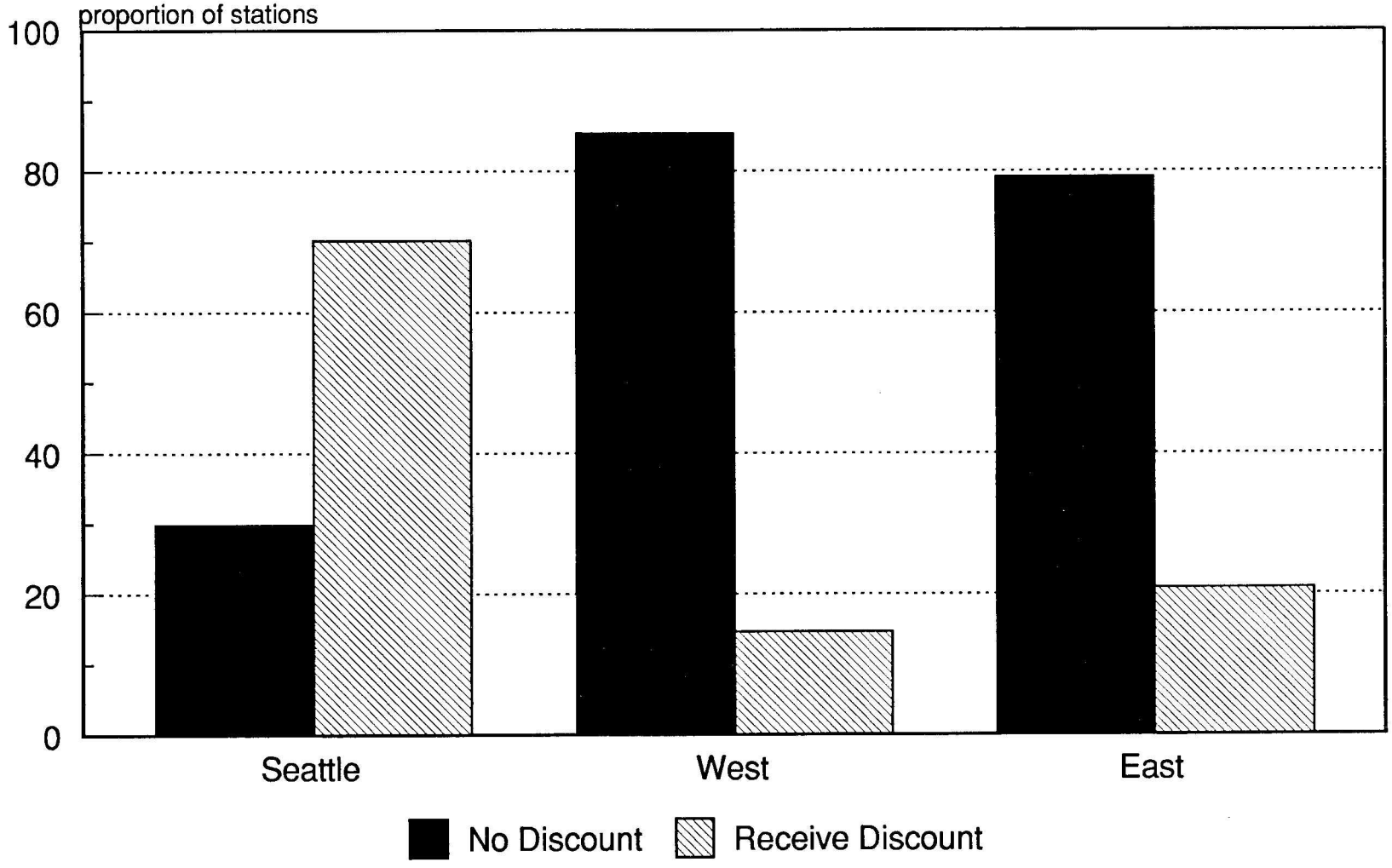


Source: WSEO Petroleum Prices Database

Graph 17

Supplier Discounts To Dealers

70% of Seattle Dealers Receive Discount



Source: WSEO Petroleum Prices Database

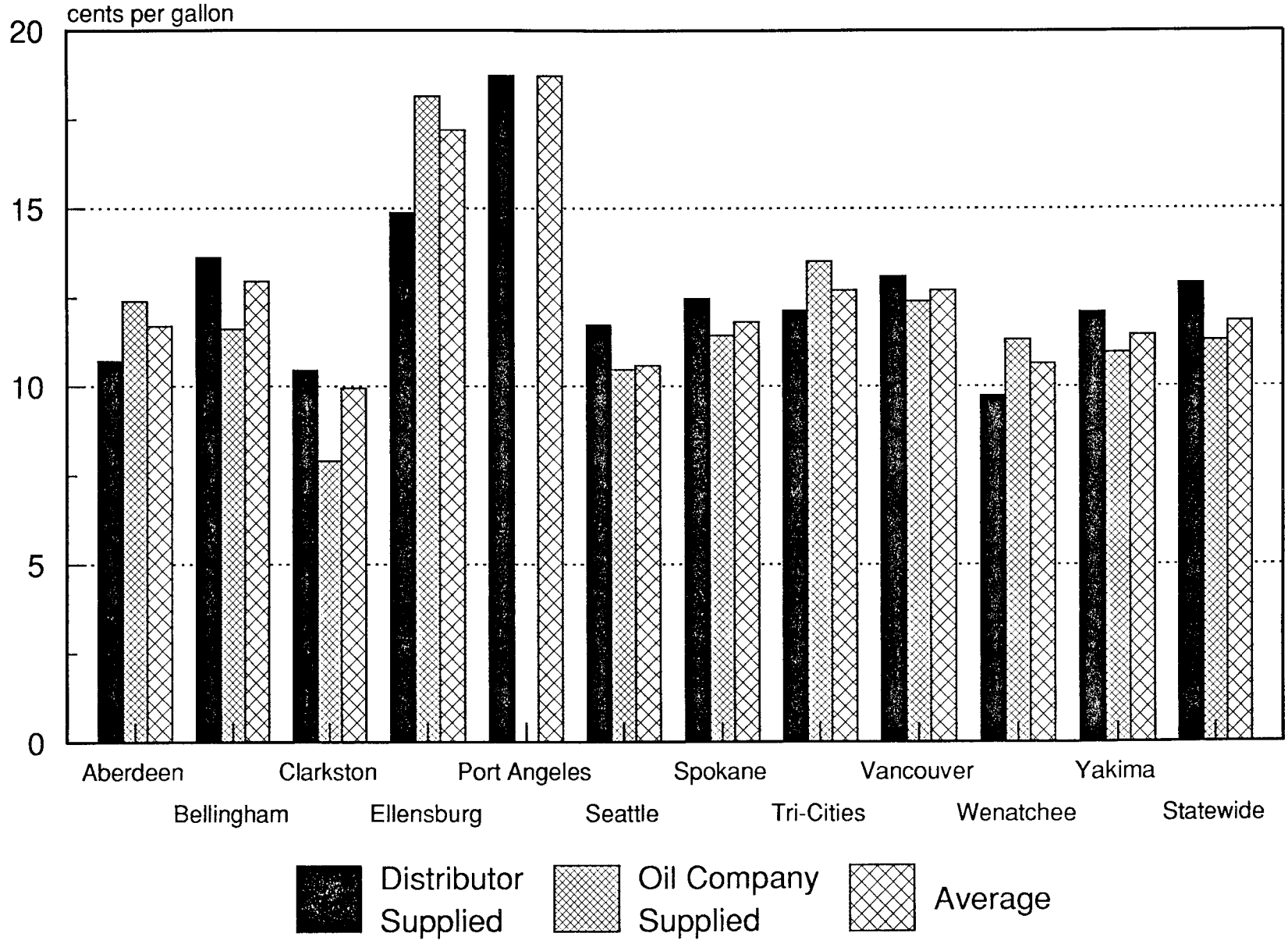
Graph 18

Dealer Margins by Supplier Type

- Stated dealer margins differ for distributor vs. oil company supplied stations
- There is not a constant difference in margins for distributor vs. oil company

Graph 18

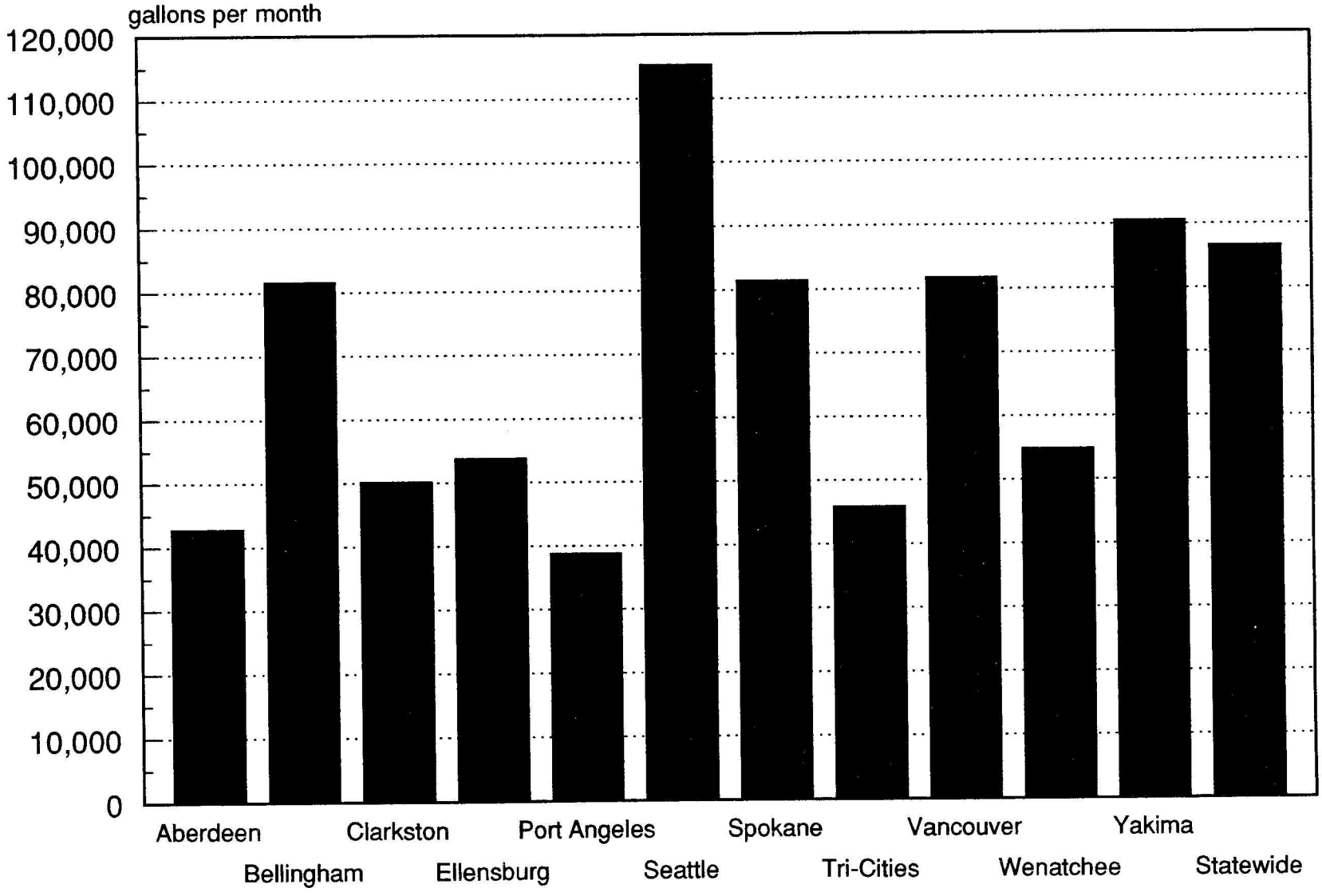
Dealer Margins By Supplier Type



Note: Margins are not adjusted to reflect dealer rebates.
Source: WSEO Petroleum Prices Database

Graph 19

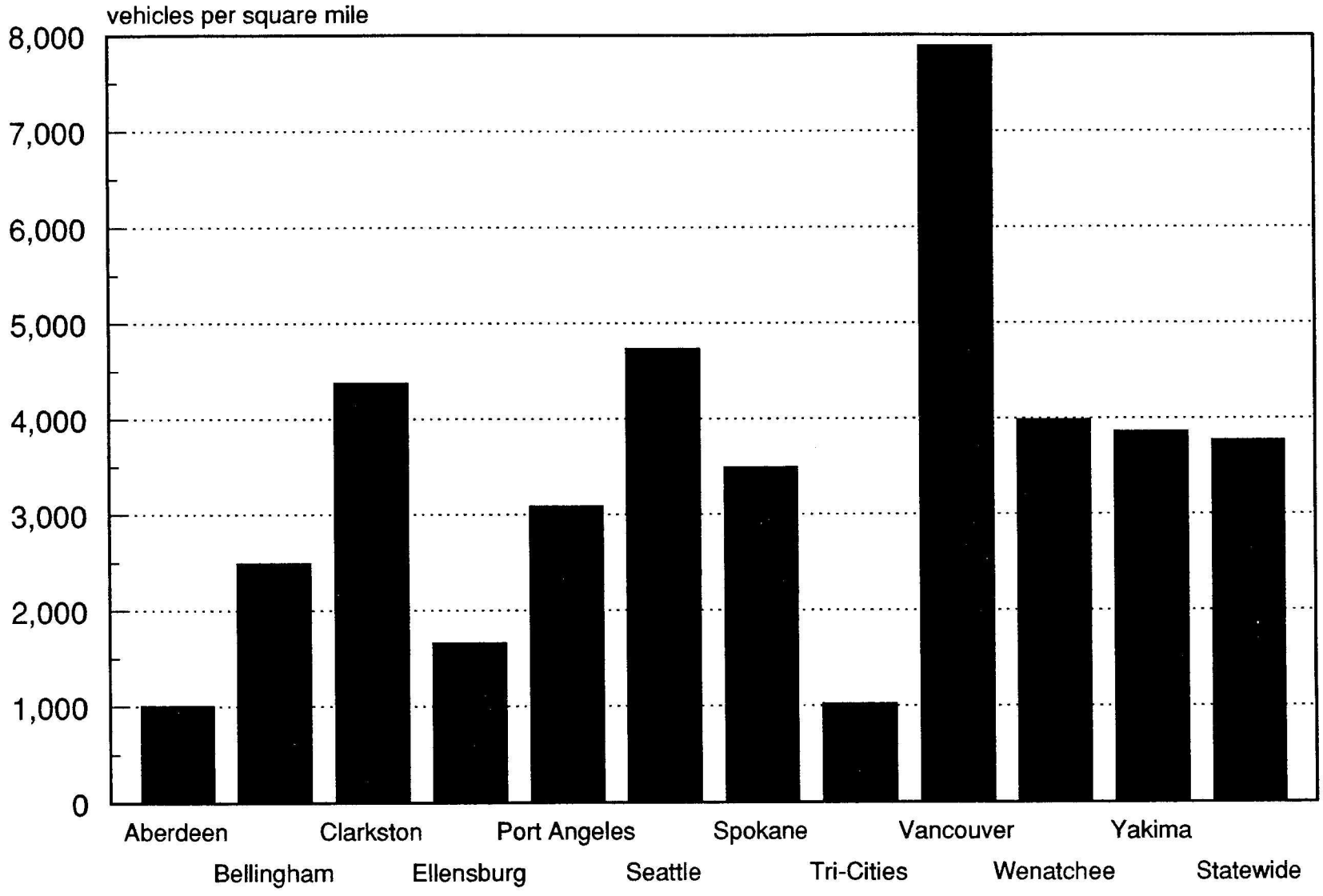
Average Monthly Gasoline Sales Volume Per Station



Source: WSEO Petroleum Prices Database

Graph 20

Vehicle Density By Metro Area

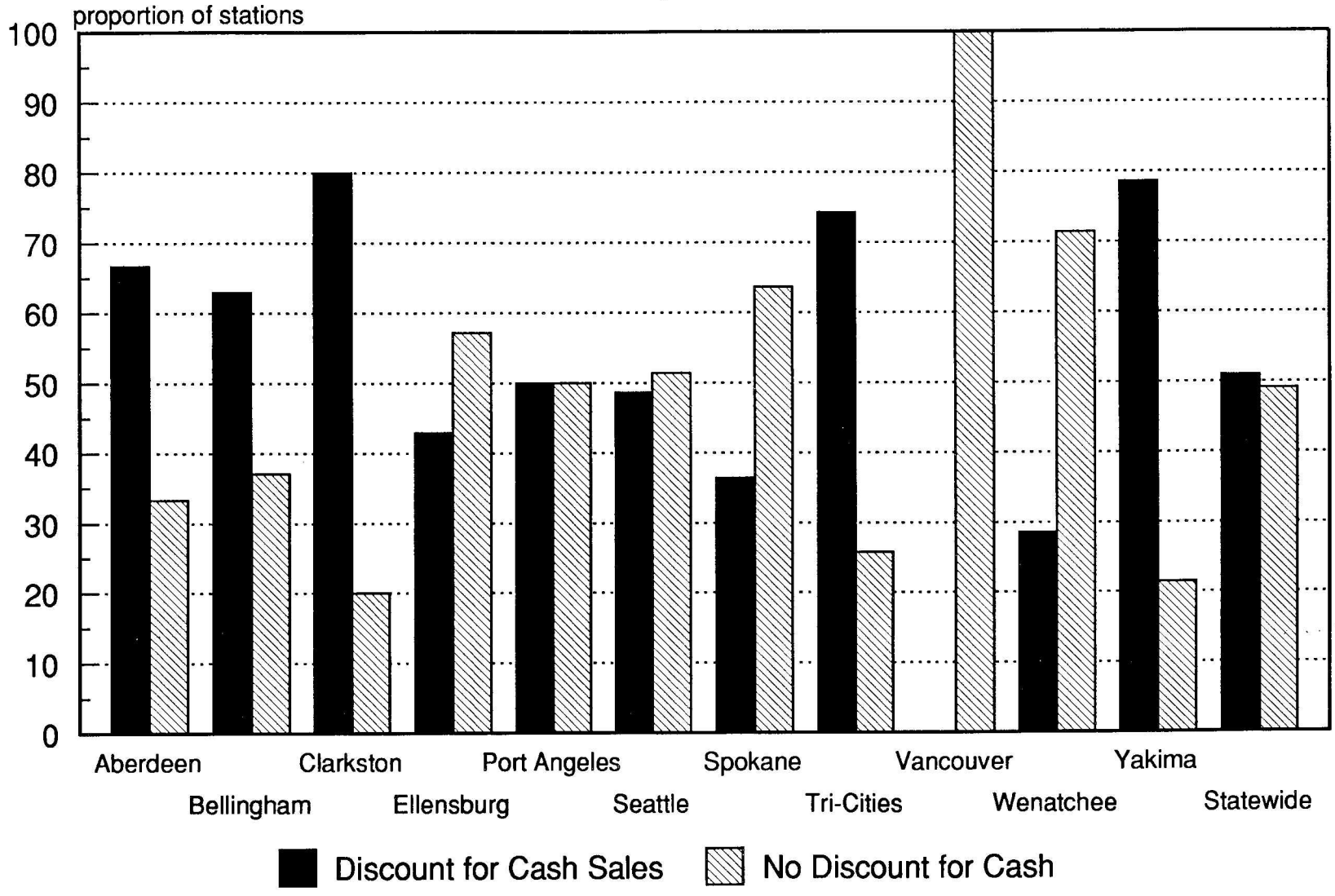


Note: Total registered personal vehicles in county(s) divided by total square miles of urban areas in county(s). Source OFM State Data Book.

Source: WSEO Petroleum Prices Database

Graph 21

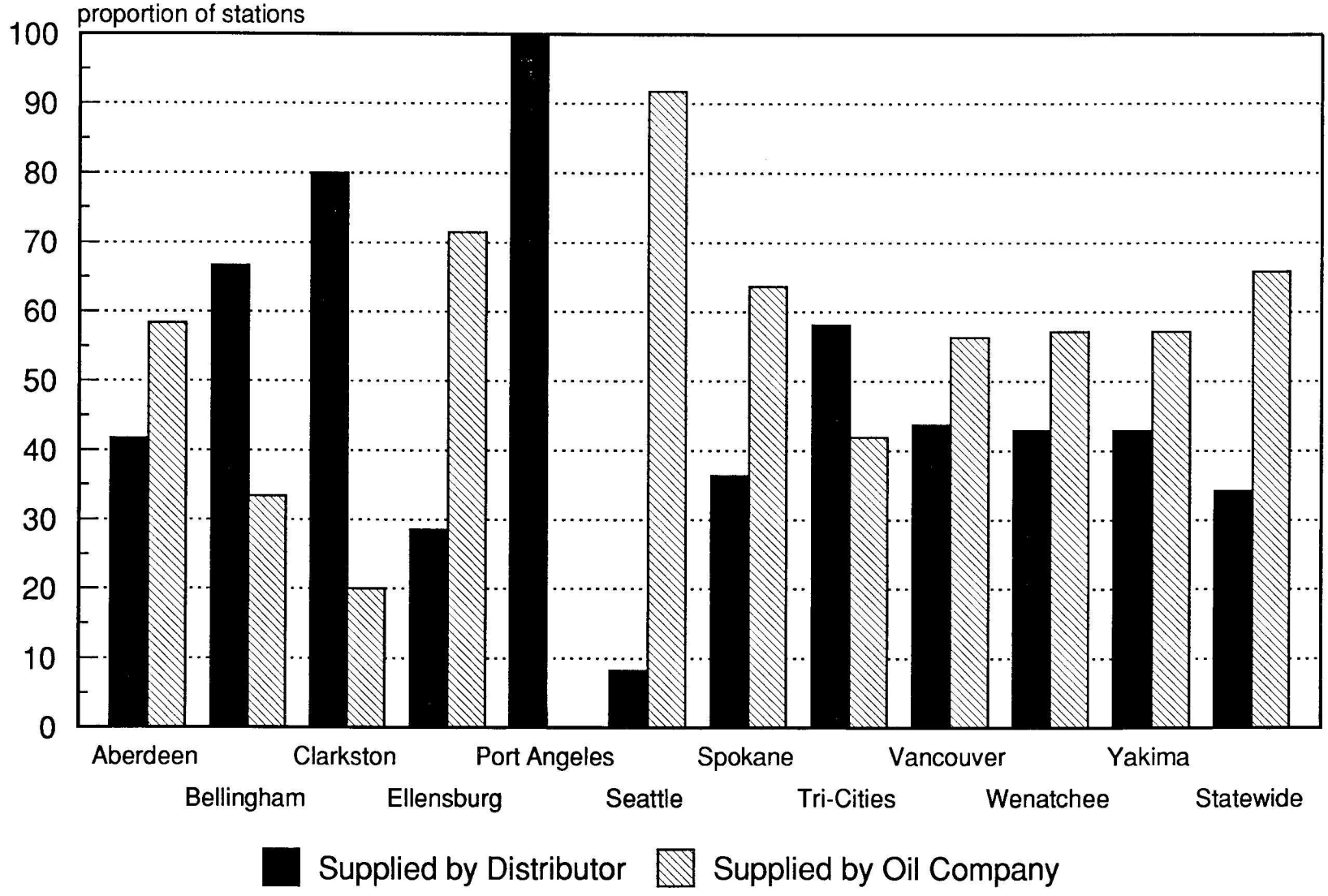
Mix of Stations Offering Discounts for Cash vs. Credit Purchases.



Source: WSEO Petroleum Prices Database

Graph 22

Mix of Oil Company and Distributor Supplied Stations by Metro Area



Source: WSEO Petroleum Prices Database

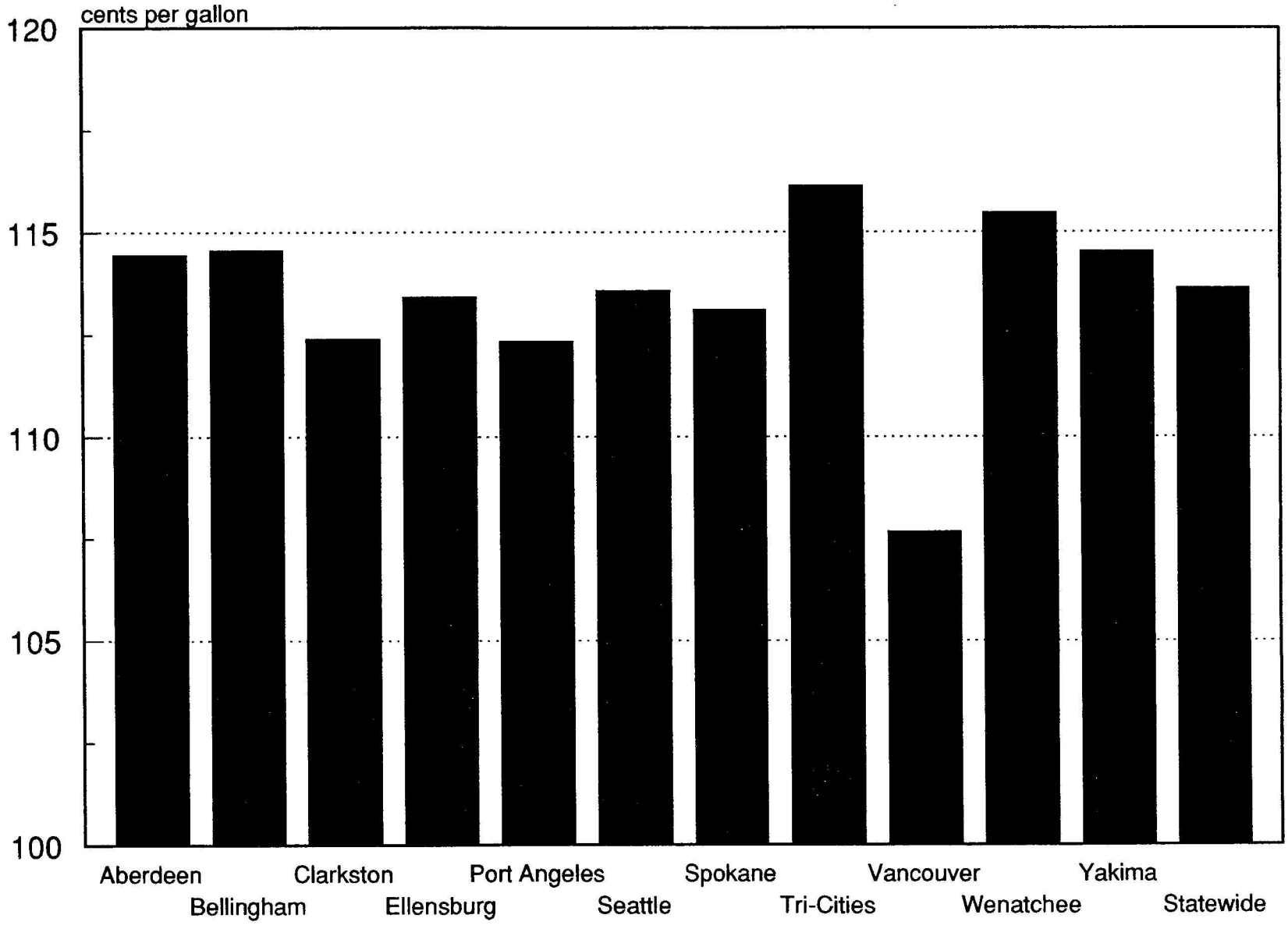
Graph 23

Estimated Wholesale Prices

- The estimated wholesale price in the WSEO price model is an average wholesale price calculated by removing the transportation cost from the dealer buying price
- The estimated wholesale price is not related to supplier type

Graph 23

Estimated Wholesale Prices



Note: Estimated Wholesale Price is the stated dealer buying price minus transportation costs.
This price does not reflect any supplier discounts or rebates.
Source: WSEO Petroleum Prices Database

Graph 24

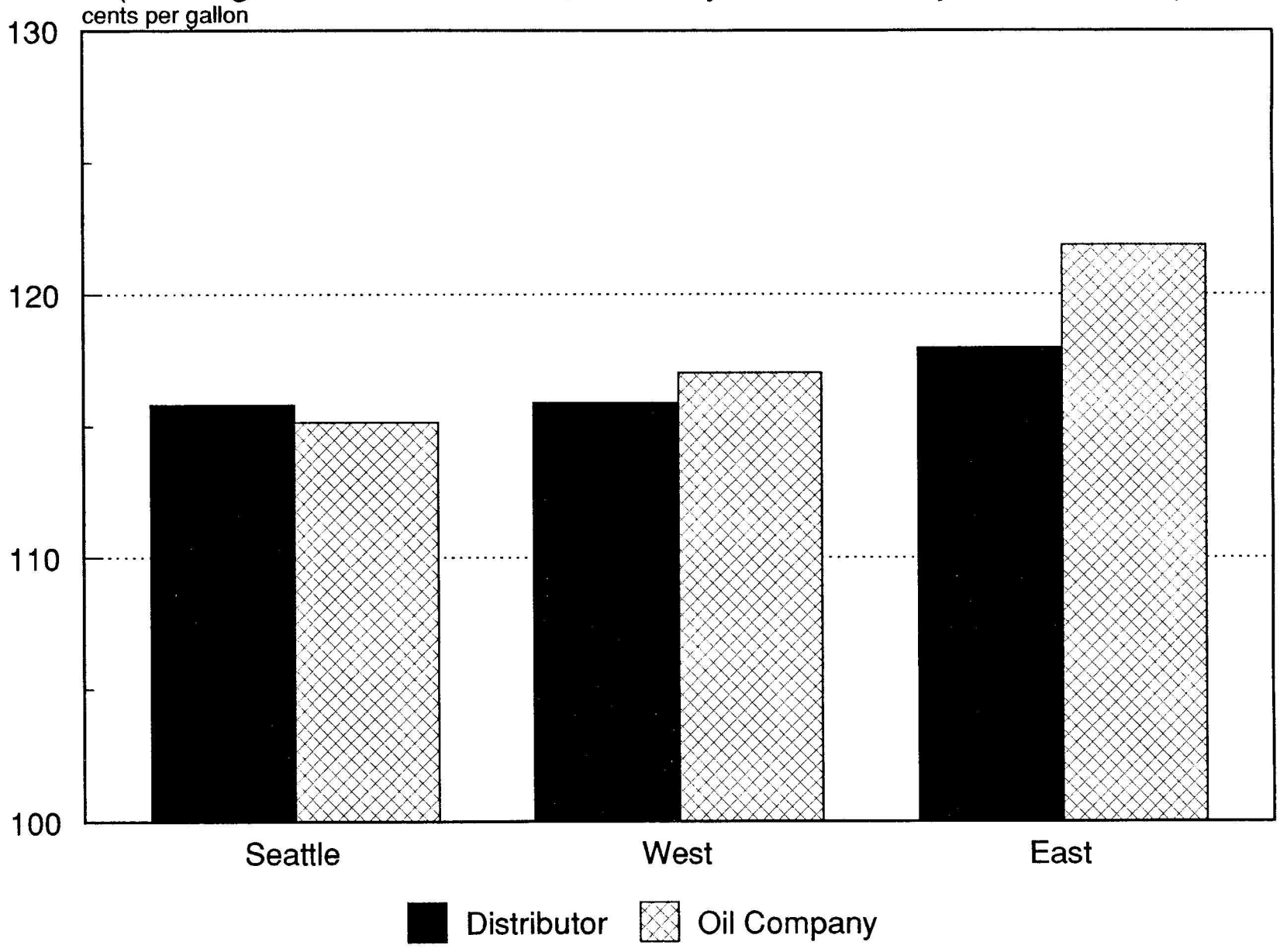
Average Dealer Buying Prices

- In Seattle, distributor supplied stations pay higher prices than oil company supplied stations. Outside of Seattle, on average, the opposite is true.

Graph 24

Average Dealer Buying Prices

(Average of October 1990, January 1991 and April 1991 data)



Source: WSEO Petroleum Prices Database

Graph 25

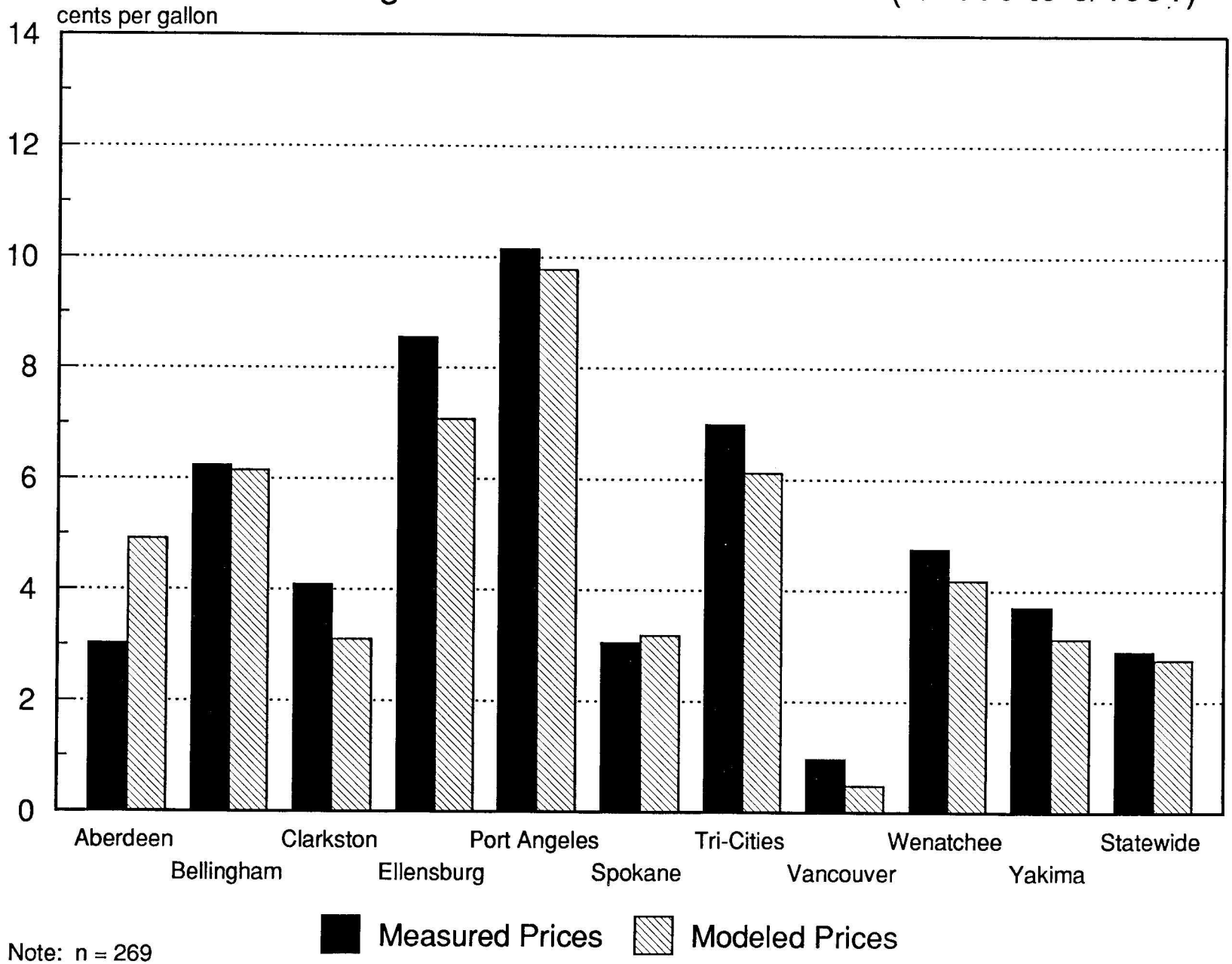
Difference in Price from Seattle

- Graph indicates the average retail price differential between Seattle and each city included in the study.
- Each city paid more on average for a gallon of unleaded gasoline than Seattle.
- The actual prices are the average of the reported prices for each of the 269 stations in the model. The modeled prices are the average of the predicted prices for the same 269 stations.

Graph 25

Difference in Price From Seattle

Average Unleaded Self-Serve Cash (7/1990 to 6/1991)



Note: n = 269

Source: WSEO Petroleum Prices Database

Graphs 25 - 29

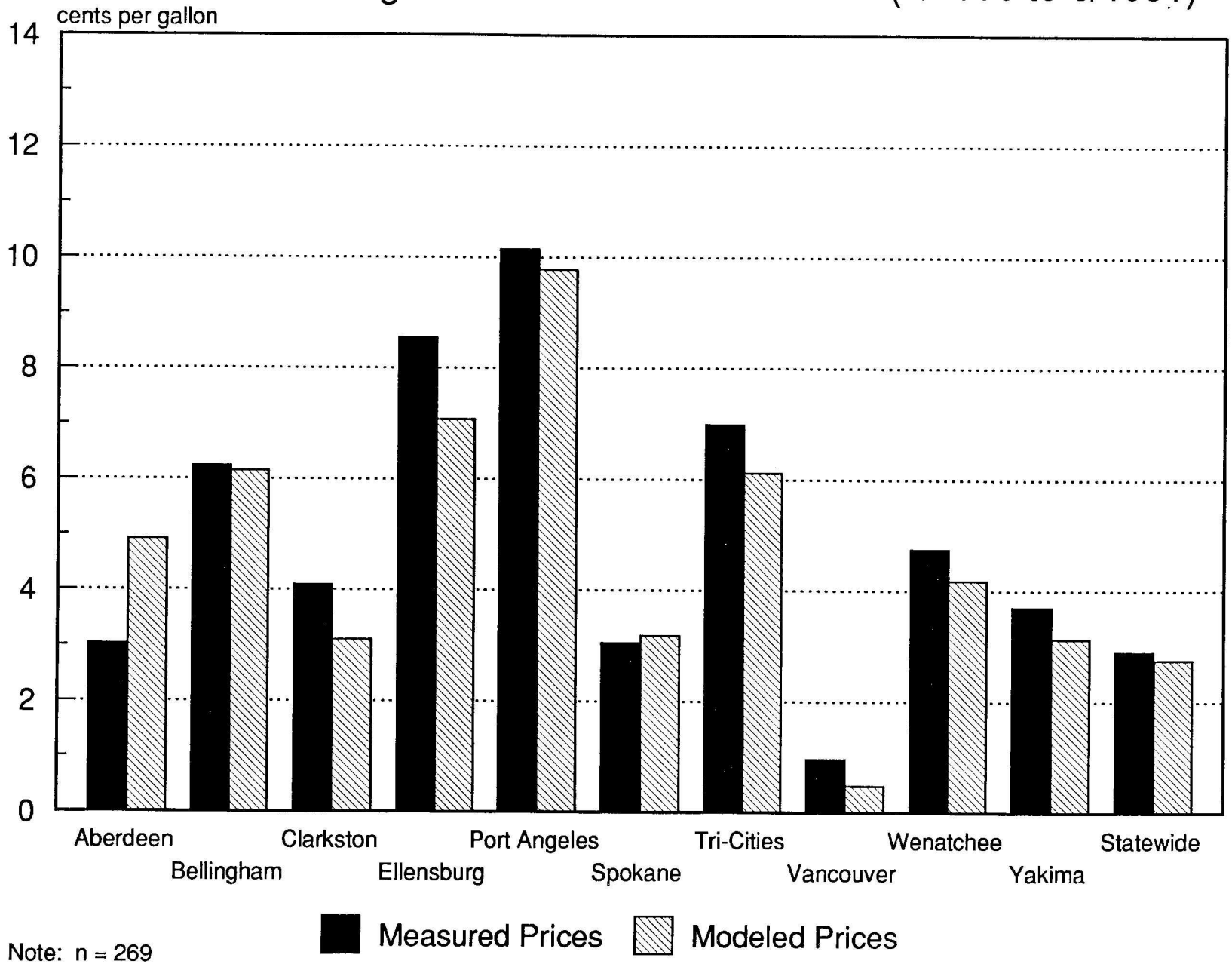
Components of Price Difference from Seattle

- Graphs show what variables in each city are pushing prices above Seattle
- For example, Clarkston has 3 variables, (dealer margin, est. wholesale & discount for cash) pushing the price 1.1 cents below Seattle, and 4 variables pushing prices 4.2 cents above Seattle for an average city price above Seattle of 3.1 cents. The effects of the variables for each city on this graph equal the modeled price difference from Seattle on Graph 25.

Graph 25

Difference in Price From Seattle

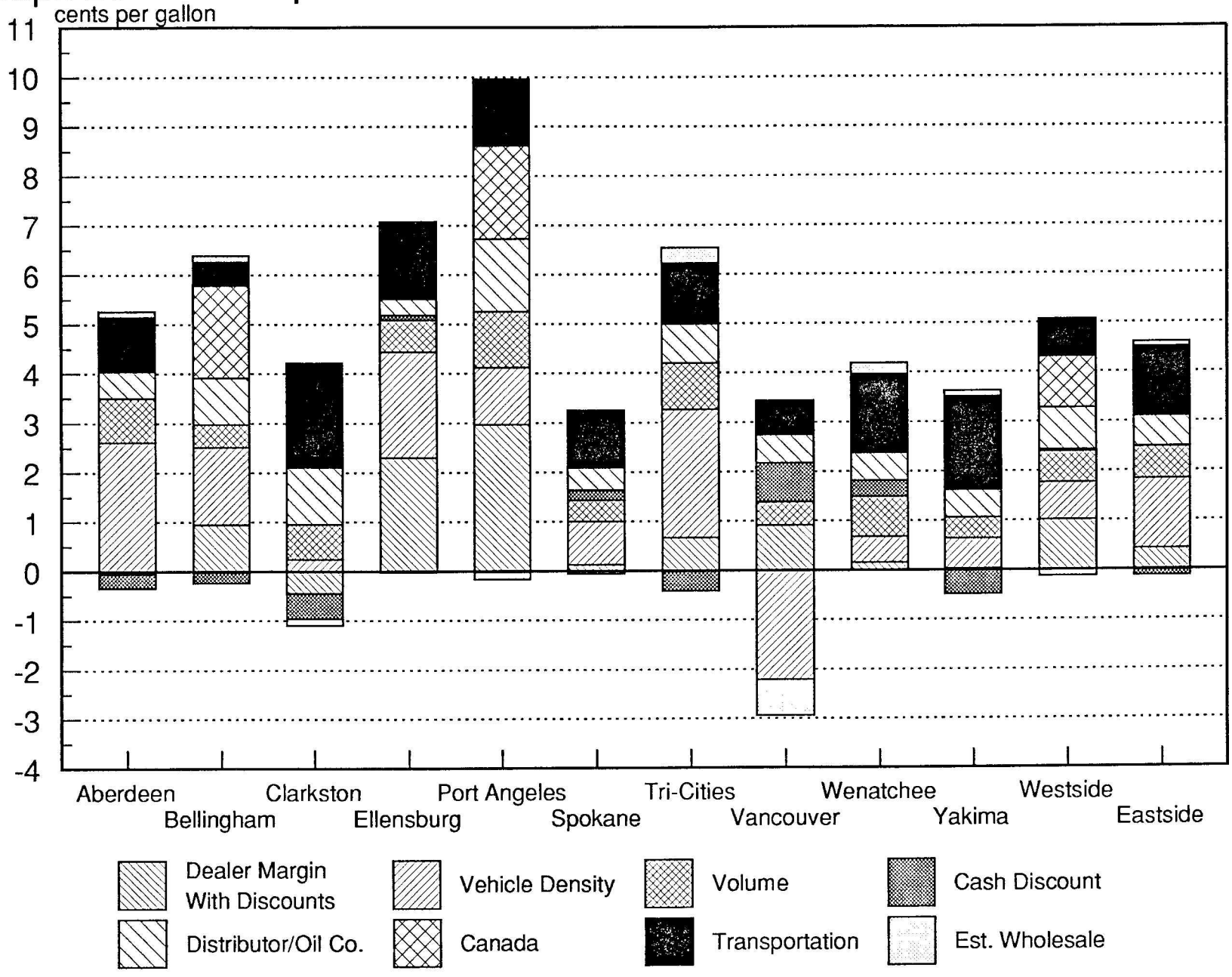
Average Unleaded Self-Serve Cash (7/1990 to 6/1991)



Note: n = 269

Source: WSEO Petroleum Prices Database

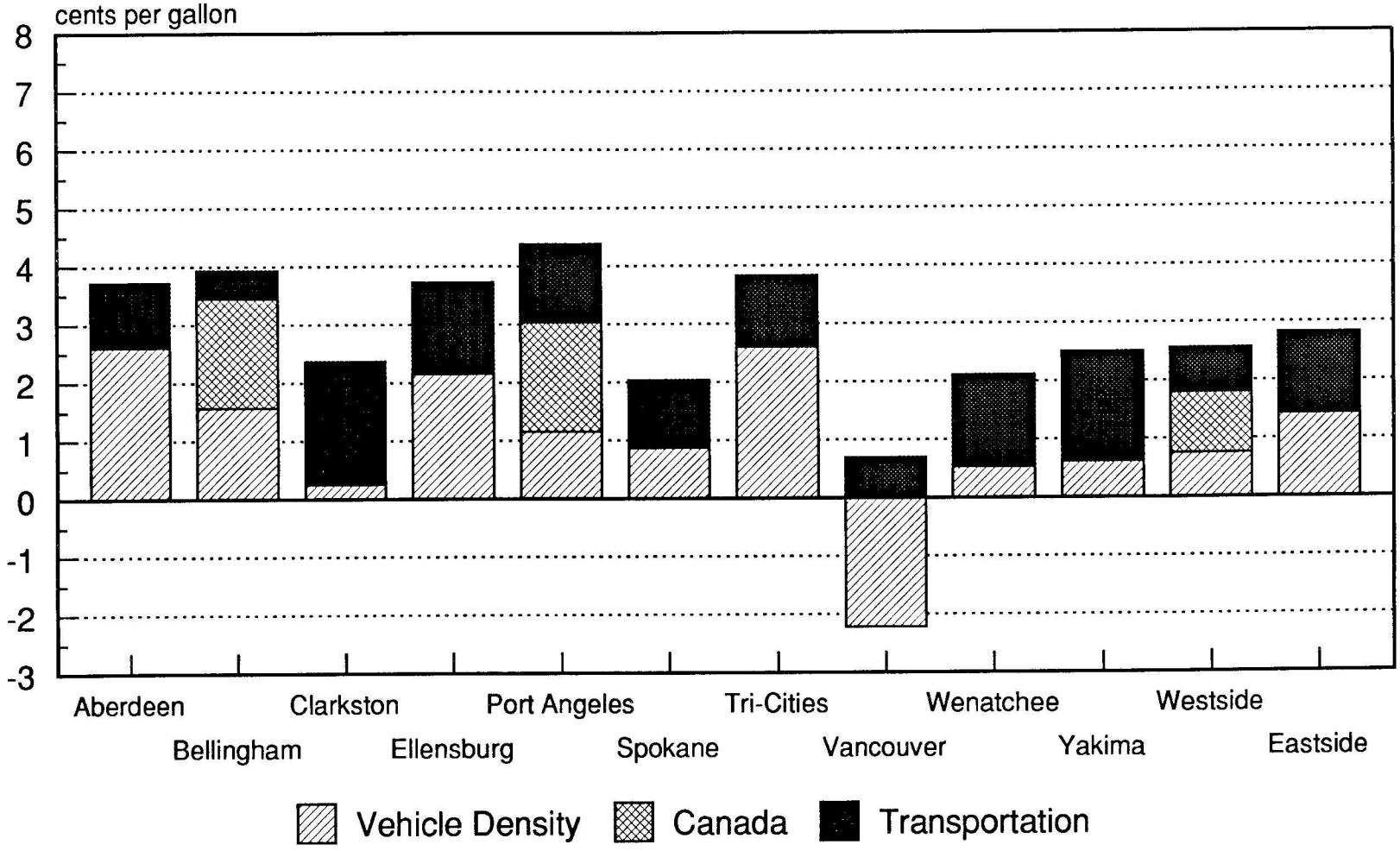
Graph 26 Components of Price Difference From Seattle



Source: WSEO Petroleum Prices Database

Graph 27 Components of Price Difference From Seattle

General Market Variables

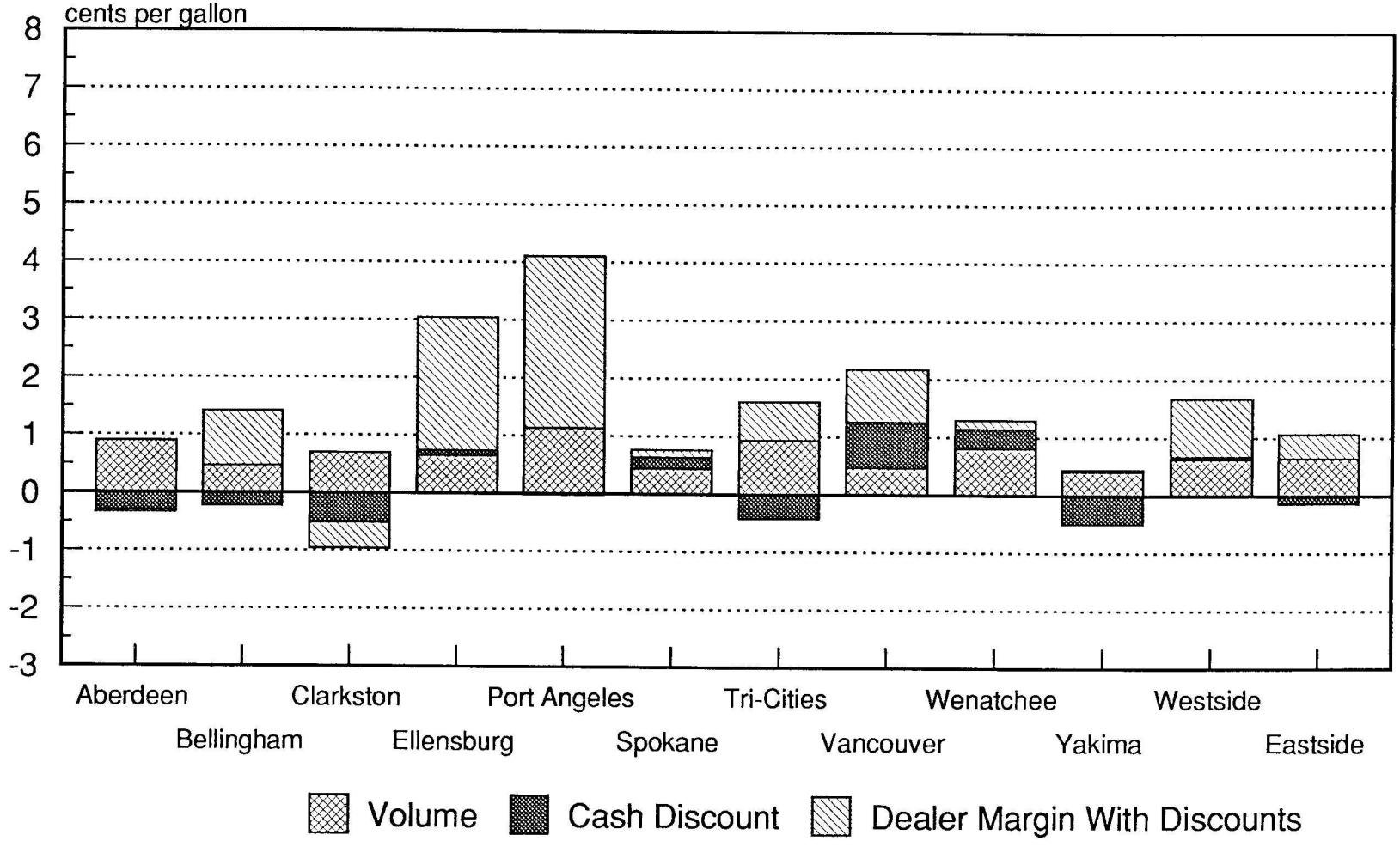


Note: Calculated from WSEO study price model.
Source: WSEO Petroleum Prices Database.

Graph 28

Components of Price Difference From Seattle

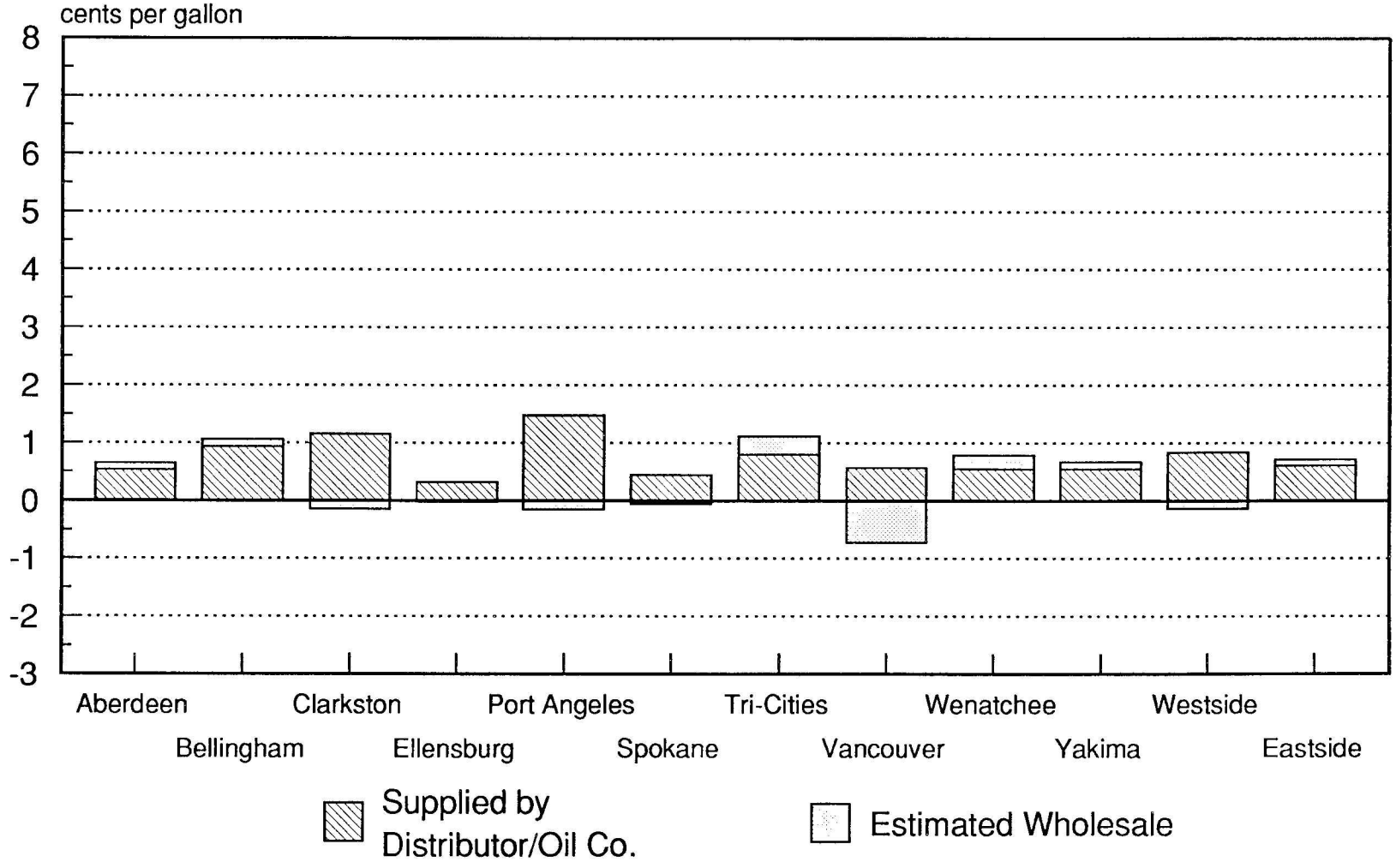
Retail Market Variables



Note: Calculated from WSEO study price model.
Source: WSEO Petroleum Prices Database

Graph 29 Components of Price Difference From Seattle

Wholesale Market Variables



Note: Calculated from WSEO study price model.
Source: WSEO Petroleum Prices Database

Graph 30

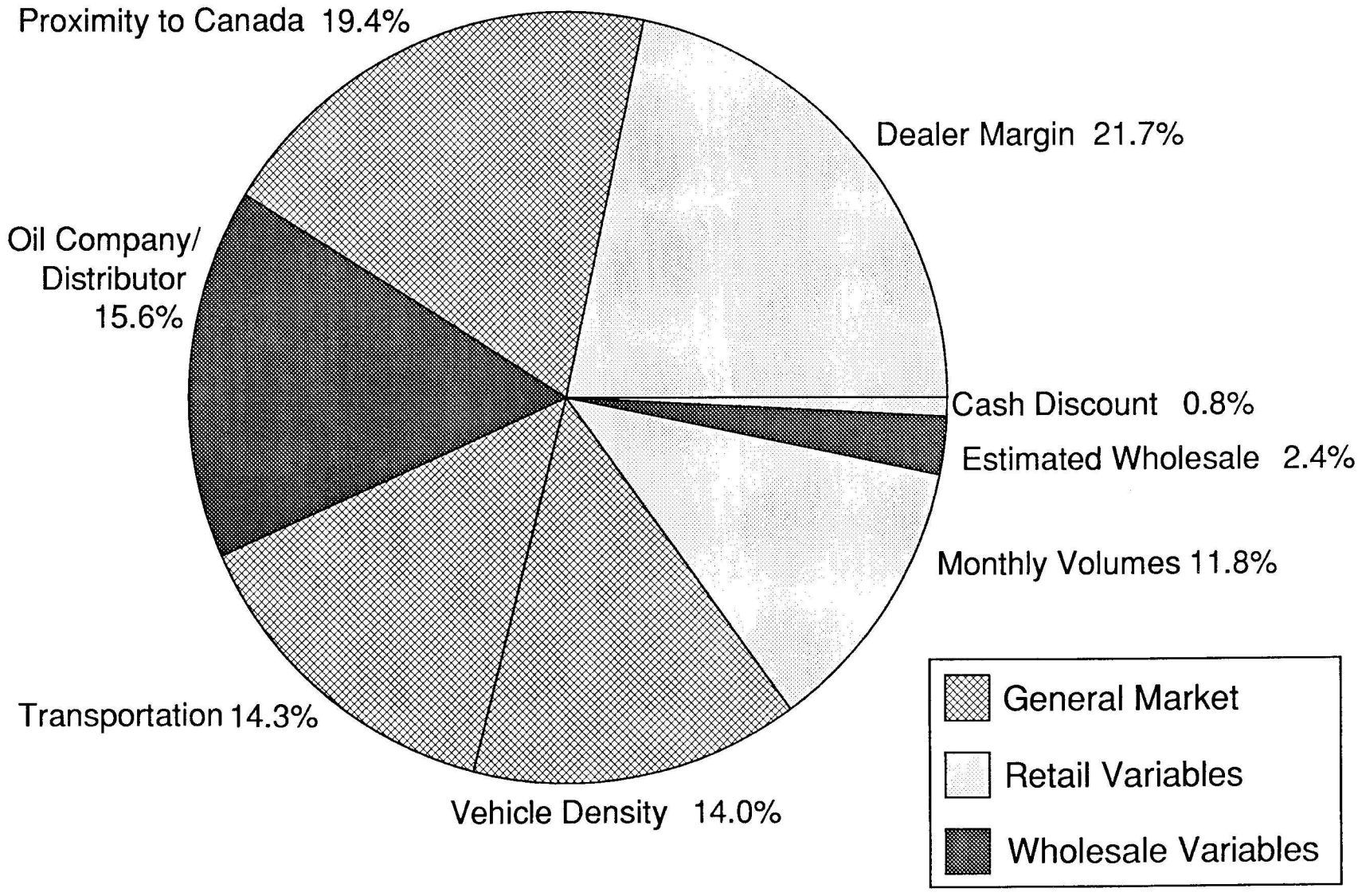
Proportional Contribution to Price Difference
Seattle Metro vs. Western Washington

- Pie chart is the Westside bar on Graph 26
- The General Market variables explain nearly 50% of the price difference.

Graph 30

Proportional Contribution to Price Difference

Seattle Metro vs. Western Washington



Source: WSEO Petroleum Prices Database

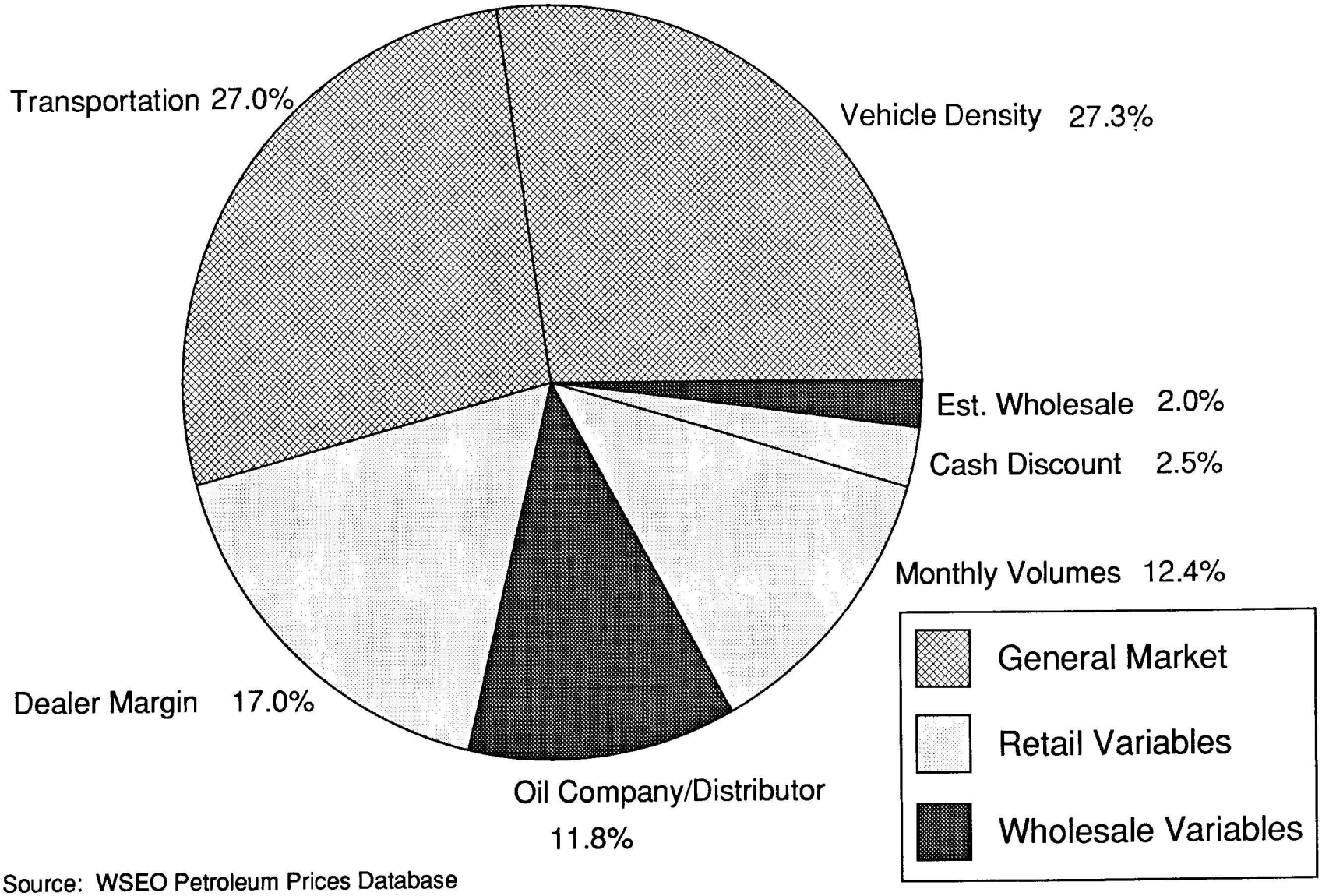
Graph 31

Proportional Contribution to Price Difference
Seattle Metro vs. Eastern Washington

- Pie chart is the Eastside bar on Graph 26
- The General Market variables explain nearly 55% of the price difference.

Graph 31 Proportional Contribution to Price Difference

Seattle Metro vs. Eastern Washington



Source: WSEO Petroleum Prices Database

Appendix A

METHODOLOGY AND DATA

This appendix provides a detailed description of how the study was performed and the data were collected.

Data Collection

To investigate the range of gasoline prices across the state and the importance of factors that may be contributing to the variation in these prices, data were collected from a variety of sources, including gasoline marketers, data service companies, and government agencies. In addition, discussions were held with industry representatives at all marketing levels. We sought extensive data from many of the operating gasoline stations, wholesalers, and refineries in the state. Approximately 10 refiners, 131 wholesalers, and 750 retailers participated. Cooperation was entirely voluntary on the part of these businesses, and a good response rate (over 50 percent) was achieved. Data were collected throughout the state on a daily, monthly, and quarterly basis. Obviously, not all stations or wholesalers provided all the data the agency sought, but the current database on petroleum prices is among the most detailed that we are aware of in the United States. Every effort was made to ensure that accurate and, to the extent possible, statistically representative data were collected.

These efforts notwithstanding, data gathered for the study are of varying levels of reliability. Because we had to rely on indirect sources and voluntary disclosure for some of the data, we do not in all cases have a complete data set. To strengthen the study, we allocated maximum resources and effort to ensure the most critical data, such as retail gasoline prices, were comprehensive and accurate. However, where data were difficult to obtain, or were collected at only a few points in time during the study, we have relied upon averages and calculated values. For example, though retail prices were collected monthly, we used quarterly information to construct dealer margin and buying price variables. Complete, comprehensive data would have required forced disclosure and larger expenditures for data collection.

Retail Price Data

To examine whether significant price differences did exist between cities, average prices were obtained from samples that were either statistically representative of a city (Seattle), or from a total census of all stations in a city (all other cities in the study).

Retail prices were provided by Lundberg Survey Inc., which conducted monthly 1 day drive-by surveys. Data were collected for cash and credit, full and self serve, leaded and unleaded regular, unleaded mid-grade, unleaded premium, and diesel fuel.

For all but the Seattle metropolitan area, we contracted with Lundberg Survey Inc. to provide monthly gasoline prices at *all* gasoline outlets within 1 mile of the city limits for each city in the study. In the Seattle area, random sample prices were collected based on the most recent Lundberg Survey Inc. census, taken in 1988. Data were collected from approximately 750 stations in 51 cities in the state. Throughout the 15-month study period, new stations were added to the database and closed stations were dropped. A check for contract compliance in June revealed that WSEO was not receiving 100 percent of stations within 1 mile of each city's limits. In response, Lundberg Survey Inc. added an additional 80 stations to the survey in July.

Of the total 750 stations for which price data were collected, some 169 stations either opened for business during the study or temporarily or permanently closed after initiation of the study, leaving us with 581 stations for which we a have complete year of price data.

A survey was conducted in December to verify the accuracy of Lundberg Survey Inc. retail data and found 75 percent of prices matched exactly. Twenty percent of stations had discrepancies between 1 and 5 cents. Approximately 5 percent of stations had price discrepancies greater than 5 cents. This appeared to be an acceptable discrepancy, because major price changes were occurring every day in December and we could not know for sure if our quality control check was done before or after the Lundberg survey nor before or after a price change that day at the station.

As a second check on the quality and reliability of the retail price data, we operated our own weekly survey of approximately 100 stations in the state. All of these were also in the Lundberg survey. This survey began in August after the invasion of Kuwait and was useful for determining that Lundberg survey monthly prices were not single-day anomalies during the price-sensitive Gulf crisis period.

Crude Oil Prices

Most gasoline used in Washington is refined from Alaskan North Slope (ANS) crude. ANS refiner acquisition prices are estimated using state of Alaska, Department of Natural Resources data and from discussions with refiners. Gasoline coming into the state through the Yellowstone Pipeline from Montana and the Chevron Pipeline from Utah is refined from inland domestic crude. Estimated inland domestic refiner acquisition crude prices were provided by the Utah State Energy Office. Refiner acquisition crude prices were used to estimate refiner margins for gasoline sold in the state and to run as a variable in modeling price effects.

Wholesale Gasoline Prices

Wholesale gasoline prices were collected from several sources. Daily data were downloaded from the Oil Price Information Service (OPIS) Petroscan database. These prices were used to calculate wholesale prices for city markets and as a variable in modeling price effects. Wholesale prices were also collected quarterly from terminal wholesalers and distributors, through surveys mailed in the summer, fall, winter and spring of 1990-91. Prices collected from the surveys were compared with Petroscan prices to confirm their accuracy, and strongly support use of Petroscan's wholesale pricing data. Wholesale prices to distributors were also used to calculate distributor operating margins.

Petroscan provided branded and unbranded rack prices at most major terminals in the state. Where this information was lacking we used either company-provided wholesale data, an average of wholesale prices, or prices from the nearest terminal with the appropriate brand. Major volume stations may require daily deliveries of gasoline, while very small stations may go for several weeks between deliveries. On average, however, stations sell sufficient volumes to require additional supplies at least every third day. Therefore, terminal prices used in our analysis were averaged over a 3 day period.

Dealer tankwagon (DTW) prices were available for only four terminals and five oil companies. Some companies claimed they do not track DTW prices.

Dealer purchase prices were collected quarterly as a part of the general quarterly survey of station characteristics and marketing information.

Transportation Data

Transportation costs were collected from pipeline companies, from shipping companies, and from the Washington Utilities and Transportation Commission (UTC) and the Federal Energy Regulatory Commission (FERC).

Gasoline transportation costs fall into two categories: 1) pre-terminal, where gas is transported from refineries by barge or pipeline to bulk terminals and 2) post-terminal, where gasoline is transported from terminals either directly to retail outlets or to small distributor bulk terminals and then to retail outlets. Oil companies supply some retail outlets directly, and pay both pre- and post-terminal transportation costs for these stations. Distributors pick up product from the terminals and incur the cost of post-terminal transportation.

Both average and marginal transportation costs were calculated for use as variables. Average transportation costs were calculated by estimating the proportion of time each alternative transportation system was used. We assumed gasoline marketers contract for total supply from the least costly transportation service, usually pipelines, and that nominations for transportation quantities represent total demand. The amount that nominations were above pipeline capacity during any month represent supply that must come from another source, and we used the costs of providing that supply through the nearest unconstrained transportation system. Average costs were therefore based on how much each system was used.

Marginal costs were calculated using the least costly, unconstrained transportation system. In any month when a primary transportation system was constrained (nominations were above capacity), the marginal cost represented the least costly unconstrained alternative. Marginal costs therefore represent the cost of bringing the last required gallon to a city.

Olympic Pipeline is occasionally at capacity requiring barge shipments to Portland from Puget Sound terminals. Higher costs to Portland increase costs for any city dependent on that transportation route including Umatilla, Pasco, and Yakima, and occasionally Spokane and Ellensburg. Large amounts of gasoline are off-loaded from the Chevron Pipeline in Boise, Idaho each month, constraining the amount that can be delivered to Pasco. Yellowstone Pipeline is occasionally at capacity requiring delivery to Spokane and Moses Lake from Pasco through a leg of the Chevron Pipeline that is never at capacity. Pipeline companies provided monthly capacity, nomination, and throughput data. Marine shipping companies provided barge rates.

WSEO used WUTC common-carrier rates to calculate post-terminal transportation costs. We assumed distributors and oil companies incur the same operational costs using their own trucks because regulated truck transport prices are calculated to cover all non-storage costs of product transportation including labor, insurance, maintenance, and truck replacement. Costs of delivery from terminals to cities was based on WUTC baseline routes for intercity transport, and on per mile rates for non-baseline routes. We assumed an average distance of 15 miles for transportation from a terminal in any city to stations in the same city. We assumed stations receive gasoline from the nearest terminal with the appropriate brand. Distributors violate their contracts if they are caught supplying stations with any but the brand of contract. Distributors and oil companies provided contract information specifying purchase brands. In rare cases stations receive gasoline from terminals that are not the closest to the city.

Market Structure Data

Market structure comprises those contractual and physical realities that characterize a market area. Market structure includes but is not limited to ownership status, brand affiliation, general contract terms and conditions, transportation practices, facility locations, alternative profit options, transaction alternatives (cash and credit), service options (full and self serve), and average sales volumes.

Primary market structure data came from four quarterly surveys mailed to retail outlets, distributors, and oil companies in the summer, fall, winter and spring of 1990-91. We selected quarterly, not monthly surveys primarily because of cost, but also because market structure data are assumed to change more

slowly than pricing and sales data. In addition, rejecting the use of subpoena power, we relied on the good graces of marketers to supply the information requested. Thus, we did not want to burden marketers beyond what was necessary. Quarterly surveys provided us with good seasonal data; we did not want to jeopardize that information by being a monthly nuisance to local businesses that might tire of answering questions. An on-going process of looking at returned surveys and interviewing marketers allowed us to refine each ensuing survey.

We presumed that different market structure variables might explain the difference in prices between market areas. Therefore the primary use of market structure data was to construct variables for analysis of gasoline price variation. The survey data were used for this purpose and were augmented by a "market density" variable calculated as the concentration of vehicles in each metropolitan area (vehicles per square mile).

Data Analysis

Our analysis of the data collected involved three steps, the results of which were reported on a preliminary basis in our interim report and have been refined and strengthened in the current report.

Step 1:

Across the state, we divided 51 cities into 11 markets comprising the metropolitan areas of Aberdeen, Bellingham, Clarkston, Ellensburg, Port Angeles, Spokane, Vancouver, Wenatchee, Yakima, Seattle (Snohomish, King, and Pierce counties) and the Tri-cities. These represent rural and urban, and small and large populations on both sides of the Cascade mountain range.

We chose to examine variation in unleaded self-serve cash prices, our dependent variable, because this category of gasoline service represents by far the greater part of gasoline sales in the state.

We averaged prices over an extended period to account for the effects of seasonal variation and to reduce the chance of studying an anomalous point in time. For our preliminary report prices were averaged over the II-month period from April 1990 through February 1991. For the final report we were able to average over a full year and to expand the number of stations available to examine by using the period July 1990 through June 1991. This period included normal seasonal variation and some important surprises-a federal gas tax increase and the tumult caused by the threat and existence of war in the Gulf.

Step 2:

To test whether basic market assumptions could be used to predict prices in the cities studied we constructed a simple predictive model. The average price for each station was estimated as a simple function of reported wholesale prices (rack rates), transportation costs, taxes, and average dealer margins. Prices predicted by this simple model were compared with actual monitored prices. The results of this analysis are included in our interim report.

While the predicted prices agreed reasonably well with actual prices when averaged within the 11 metropolitan areas, significant discrepancies existed when the comparison was made for individual stations. In fact, the simple model was only able to explain about 30 percent of the variance among station prices throughout the state. We concluded from this that, while basic market data appears to be consistent with station prices *on average,* a more detailed and powerful model was needed to better explain variation in prices at the station to station level.

Step 3:

Proceeding on the assumption that gasoline prices are influenced by a combination of factors including wholesale prices, market characteristics, dealer affiliations, dealer marketing decisions, and others, we examined the relationship between price and a host of such factors using analysis of covariance (ANCOV A). In simple terms, we tested the statistical relationship between more than 150 variables and gasoline price in order to establish a linear model that relies on the most important of these factors

to predict gasoline price for individual stations. Variables were considered significant at the 95 percent level.

An estimate of the proportion of variance explained by each variable was made using sequential sums of squares with variables ordered by their level of statistical significance.

In February, 1991, we provided the Legislative Transportation Committee (LTC) with preliminary analysis results in an interim report. In this report, six variables were identified that explained 85 percent of the variation in prices between cities. This analysis was based on 11 months of retail price data and 213 stations for which we had obtained all of the necessary market structure data.

We had several concerns about our interim analysis. We were still waiting for data to arrive from our third and fourth surveys. Also, the analysis suggested pre-terminal transportation costs were not a significant factor, and we wanted to refine our transportation data. Dealer margins varied substantially in several cities and we wanted to see if we could find out why. We were also concerned because the supplier variable (oil company or distributor) was complicated with geographic information (a Seattle, non-Seattle variable) and appeared to be capturing effects from more than just the source of gasoline supply. Finally, we wanted to test some additional variables in the analysis to see if they could better explain prices.

Between February and June, 1991, we collected more complete market structure data, attempted to collect more information regarding the original six significant variables, and continued to refine the analysis. Our final analysis found eight variables to have linear coefficients that were statistically significant (different than 0). This set includes the most important of the original six variables, modifications of two of the six and an additional two variables. In combination, these variables were capable of accounting for nearly 80 percent of variation in gasoline price. The percentage of variation explained dropped because a slightly different period was analyzed and the size of analyzed sample was expanded by 26 percent (213 to 269). In the final model total marginal transportation costs are included, a wholesale purchase price is included, a proximity to Canada variable is included, and the supplier variable is no longer complicated with geographical information. A ninth variable indicating whether a dealer receives wholesale discounts is included in the model; however its explanatory power was added to dealer margins, where it acts to correct calculated margins which do not include discounts.

A cautionary note regarding the interpretation of the results of our statistical analysis is important. We have used ANCOVA to examine the structure of variance in gasoline prices for this set of stations over this specific 12-month period of time. The analysis establishes which variables are associated with variation in price and to what degree. It helps answer the question “What factors were affecting gasoline prices in the set of stations analyzed over the period July 1990 to June 1991”. There is no necessary reason to believe that gasoline prices over the coming year or future years will continue to respond to the same set of variables, or to each variable in the same magnitude. This is not a forecasting model. Its usefulness is in providing an answer to the question stated above and providing a snap-shot look at how the gasoline market in Washington Appears to have worked over this year-long period.

Appendix B

SURVEY EXHIBITS

Primary market structure data and some pricing and volume data came from four quarterly surveys mailed to retail outlets, distributors, and oil companies in the summer, fall, winter and spring of 1990-1991.

Quarterly surveys were mailed to approximately 750 retail outlets. Four hundred ninety two outlets or 66 percent returned at least one survey. Quarterly surveys were also sent to approximately 200 distributors and 20 refiners who market in Washington. One hundred thirty one distributors, or66 percent, and 10 refiners, or 50 percent returned at least one survey. Surveys were updated to ensure that respondents who missed earlier surveys had the opportunity to provide some data requested on earlier surveys.

This appendix contains an example of a cover letter sent to potential respondents and several survey forms.

RICHARD H. WATSON
Director

STATE OF WASHINGTON
WASHINGTON STATE ENERGY OFFICE
809 Legion Way S.E., FA-11 • Olympia, Washington 98504-1211

June 30, 1990

Re: Gasoline Survey

Dear Gasoline Marketer:

The Washington State Legislature recently passed Substitute Senate Bill 5373, which directs the State to study gasoline pricing and supply practices in Washington.

Section 43.21F.060 of the Revised Code of Washington authorizes the Energy Office to:

> "obtain all necessary and existing information from energy producers, suppliers and consumers, doing business within the state of Washington... Such information may include but not be limited to: sales volume... and energy costs."

The Energy Office is therefore conducting statewide retail and wholesale gasoline surveys. Information from the surveys will help Washington's citizens understand some of the reasons for differences in gasoline prices.

We realize that price and volume data is sensitive business information. All data will be kept strictly confidential. Results will be presented in aggregate (for example, by city), preventing the identification of individual businesses. RCW 43.21F.060 also establishes penalties for violation of the confidentiality statute. The Energy Office presently maintains confidential data from petroleum refiners.

The enclosed survey is the first, and most extensive of four, you will receive during the year. The next three surveys will be less detailed.

If you have questions, please contact our survey manager, Brian Lagerberg, at (206) 956-2074.

Sincerely,

Richard H. Watson
Director

RHW/mt/D-R-13

Enclosure

(206) 956-2000 or SCAN 494-2000 Teletax (206) 753-2397

Washington State Energy Office

Dealer Survey Form #1

Provide answers to all questions and include copies of receipts where indicated on form 2.

Business Basics

1. Type of Operation:

GASOLINE (Circle one)
a. Full service only
b. Self service only
c. Split island
(Full serve and self serve)

ALTERNATIVE PROFIT CENTER (Circle all that apply)
a. Service bays
b. Lub bays
c. Convenience store
d. Diesel
e. Truck stop
f. Car wash
g. Parking garage
h. None
i. Other (specify) _____
_____

2. Number of gasoline pumps operated: _____ Number of gasoline hoses operated: _____
3. Distance from highway: _____ miles. Is highway an interstate freeway? (Indicate) _____
4. Percent of sales to local customers: (Estimate) ____% Highway traffic: (Estimate) ____%
5. We have been operating in this location under current ownership for: (Circle one)
   a. Less than a year b. 1-2 years c. 3-5 years d. 6-10 years e. More than 10 years
6. Percentage of motor fuel revenues generated from sales of gasoline: (Estimate) ___%
   From sales of diesel: (Estimate) _____%
7. Operating Days and Hours: (Indicate hours under appropriate day)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

8. Is this station **leased?** (Circle one) Yes No
9. Is this station operated by a **wholesale gasoline supplier?** (Circle one) Yes No
10. Is this station: a. Branded b. Unbranded
    Indicate companies _____
11. Does this station: (Circle one)
    a. purchase from Distributor/Jobber b. Purchase from Oil Company **(Direct Service Station)**
12. On average our gasoline sales are made up of:
    _____ percent permium unleaded _____ percent regular unleaded _____ percent leaded
13. On average _____ percent of our gasoline sales are cash sales and _____ percent are credit sales.
14. On average _____ percent of our gasoline sales are full serve and _____ percent are self serve.

Contracts And Other Long Term Agreements With Gasoline Suppliers

1. We purchase our gasoline: (Circle all that apply)
   a. Under contract b. Under oral agreement c. Cash on delivery (no contract)
   d. Other (Specify) _____

   (If purchasing under contract): Number of contracts: _____

   When signing new contracts, we have changed distributors:
   a. Never b. Occasionally (every two years) c. Every contract period
   d. Other (Explain) _____

2. Our long term purchasing agreements are determined by: (Circle all that apply)
   a. Manager b. Owner c. Renter d. Other (Specify) _____

3. We decide where to purchase our long term gasoline supply based on: (Circle all that apply)
   a. No choice b. Cost of gasoline c. Guaranteed supply d. Location
   e. Past experience with distributors f. Other costs (Explain)_____
   g. Other issues (Explain)_____

Daily Operation

1. On a daily basis we purchase gasoline from: (Circle one)
   a. 1 distributor b. 2 distributors c. 3-5 distributors d. 6 or more distributors

   (If purchasing from more than one distributor): Our daily decision of where to purchase gasoline is based on: (Circle all that apply)
   a. Guaranteed supply b. Cost of gasoline
   c. Location d. Other costs (Explain) _____
   e. Past experience with suppliers f. Other issues (Explain)_____

2. Our daily purchase decisions are determined by: (Circle one)
   a. Manager b. Owner
   c. Renter d. Other (Specify) _____

3. We receive the following types of discounts: (Circle all that apply)
   Describe dollar amount and conditions.
   a. None
   b. Rent subsidy _____
   c. Volume rebate _____
   d. Sign rebates _____
   e. Other (Specify) _____

4. The mark-up on our gasoline is determined by: (Circle one)
   a. Manager b. Owner
   c. Renter d. Other (Specify) _____

5. We change our prices due to: _____

Recent Troubles?

1. Describe any difficulties you have experienced operating your station following the Kuwait invasion.

2. How have gasoline storage tank regulations effected your operation?

3. What specific problems do you face meeting gasoline storage tank regulations?

Continue On Survey Form #2.

Send to: 809 Legion Way SE, Olympia, WA 98504 (206) 956-2074

Washington State Energy Office

Dealer Survey Form #2

Provide answers to all questions and include copies of receipts where indicated.

Station Characteristics

1. How many retail gasoline stations are located within 5 blocks of your station: _____
2. How many people are currently employed full time _____ , part time ____ at this station?
3. Do you have a discount/rebate program in effect with your supplier? yes no
4. We can realistically achieve (circle) all some none of our discounts/rebates.
5. What percentage of your customers are tourists? _____%

Dealer Costs & Prices

1. **Our wholesale purchase price** (excluding taxes) on the date closest, but prior, to **April 5** was:

   _____ cents/gallon premium unleaded _____ cents/gallon mid-grade unleaded

   _____ cents/gallon regular unleaded _____ cents/gallon regular leaded

   _____ cents/gallon diesel

   Indicate date _____ Supplier Company _____

2. **Include a xeroxed copy of the invoice/receipt** for gasoline delivered on the date closest, but prior, to **April 5.** (Should match prices given in the previous question)
3. What is your average monthly cost reduction due to discounts/rebates? $_____ or _____ $/gallon.
4. Is your mark-up based on a set percentage or amount above your buying price? yes no

   If yes, What is the current percentage _____% or amount $_____.
   Does the percentage change during the year? yes no
   If yes, when? _____

5. After paying for gasoline and taxes, how is your remaining revenue allocated? Fill in **either** percentages **or** average monthly numbers.

$_____	Station rental	_____%
$_____	Loan payment	_____%
$_____	Wages	_____%
$_____	Insurance	_____%
$_____	Profit	_____%
$_____	Other overhead	_____%
$_____	Other costs	_____%
$_____	Total Margin	100%

Continue On Back

6. What is your current selling price of the following: If you do not sell these at your station circle No.

1/2 gallon of milk (2%)	$_____	No
one dozen AA eggs	$_____	No
average branded cigarette pack	$_____	No

Sales Volumes

1. What percentage of your **revenues** comes from the **sale of gasoline?** gross _____ % net _____ %
2. **Average monthly sales** during 1990: gasoline_____ gallons, diesel _____ gallons
3. Monthly sales in gallons:

	Gasoline	Diesel		Gasoline	Diesel
Jun. 1990	_____	_____	Jan. 1991	_____	_____
Sep. 1990	_____	_____	Feb. 1991	_____	_____
Dec. 1990	_____	_____	Mar. 1991	_____	_____

4. I would like proprietary information on this survey kept confidential: yes no

Thank You For Your Assistance.
Remember to include copies of receipts/invoices.

Send to: 809 Legion Way SE, Olympia, WA 98504 (206) 956-2074

Washington State Energy Office

Jobber/Distributor Survey Form #1

Provide answers to all questions and include copies of receipts where indicated on form 2.

Business Basics

1. We distribute (Circle all that apply):
   a. Premium unleaded b. Mid-grade unleaded c. Regular unleaded d. Regular leaded e. Diesel
2. Indicate service account types (Circle all that apply):
   a. Wholesale b. Retail outlets c. Agricultural d. Municipal e. Fleets
   f. Other (Specify) _____
3. Percent of total gasoline volume distributed that is delivered to retail outlets _____%
4. Number of holding tanks maintained: _____ Maximum total tank capacity _____ gallons
5. Number of retail outlets serviced: _____ Owned _____ Operated _____
6. Distance from furthest retail outlet serviced: _____ miles.
7. Average total amount of gasoline delivered per month to all retail outlets: _____ gallons,
   Diesel _____ gallons.

Contracts And Other Long Term Agreements With Gasoline Suppliers

1. We purchase our gasoline (Circle all that apply):
   a. Under contract b. Under oral agreement c. Cash on delivery (no contract)
   d. Other (Specify) _____
   (If purchasing under contract) When signing new contracts, we have changed suppliers
   a. Never b. Occasionally (every two years) c. Every contract period
   d. Other (Explain) _____
2. Our long term purchasing agreements are determined by (Circle one):
   a. Owner b. Manager c. Other (Specify) _____
3. Number of contracts currently held: _____
   Number branded _____ Indicate brand(s) _____
   Number unbranded _____ Indicate company(ies) _____
4. We hold terminal rights at:
   _____
   (Name and City)
   _____
   (Name and City)
   _____
   (Name and City)
   _____
   (Name and City)
5. What percentage of your average annual sales are secured by contract? (Resellers only) _____ percent.
6. We decide where to purchase our long term gasoline supply based on (Circle all that apply):
   a. No choice b. Guaranteed supply c. Cost of gasoline d. Past experience with distributors
   e. Location f. Other costs (Explain) _____
   g. Other issues (Explain) _____

Daily Operation

1. On a daily basis we purchase gasoline from (Circle one):
   a. 1 terminal b. 2 terminals c. 3-5 terminals d. More than 5 terminals

   (If purchasing from more than one terminal) Our daily decision where to purchase gasoline is based on (Circle all that apply):
   a. Guaranteed supply b. Location c. Cost of gasoline d. Past experience with suppliers
   e. Other costs (Explain)_____
   f. Other issues (Explain) _____

2. On a daily basis we purchase gasoline from (Circle one):
   a. 1 brand b. 2 brands c. 3-5 brands d. More than 5 brands

3. Our daily purchase decisions are determined by (Circle one):
   a. Owner b. Manager c. Other (Specify) _____

4. The mark-up of our gasoline is determined by (Circle one):
   a. Owner b. Manager c. Other (Specify) _____

5. We change our selling price due to_____

6. If you deliver gasoline or diesel to any **retail outlets** in the **following cities,** indicate where you **typically** purchase the product for that city.

Aberdeen	*Clarkston*	*Finley*	*Marietta*	*Pasco*	*Silver Lake*	*Vancouver*
Ahtanum	*Cosmopolis*	*Greenacres*	*Marysville*	*Port Angeles*	*Snohomish*	*Wenatchee*
Auburn	*Edmonds*	*Hoquiam*	*Mercer Island*	*Redmond*	*Spanaway*	*West Richland*
Bellevue	*Ellensburg*	*Kennewick*	*Millwood*	*Renton*	*Spokane*	*Yakima*
Bellingham	*Everett*	*Kent*	*Montesano*	*Richland*	*Sumner*	
Bothell	*Federal Way*	*Kirkland*	*Mountlake Terrace*		*Tacoma*	
Burien	*Ferndale*	*Lake Stevens*	*Moxee City*	*Seattle*	*Tukwila*	
Central Park	*Fife*	*Lynnwood*	*Opportunity*	*Selah*	*Union Gap*	

SALES CITY	Usually Purchase at (City)	Backup Purchase City	Percent Use Backup
_____	_____	_____	_____ %
_____	_____	_____	_____ %
_____	_____	_____	_____ %
_____	_____	_____	_____ %
_____	_____	_____	_____ %

7. We use a backup terminal when (list reasons). _____

Recent Troubles?

1. Describe any difficulties you have experienced operating your company following the Kuwait invasion (August 2, 1990).

2. How have gasoline storage tank regulations effected your operation?

3. What specific problems do you face meeting gasoline storage tank regulations?

Continue On Survey Form #2.

WSEO
Washington State Energy Office

Jobber/Distributor Survey Form #2

Provide answers to all questions and include copies of receipts where indicated.
These questions refer to your **distribution business only.**

Business Characteristics

1. How many people are currently employed full time ____, part time ____, with your distribution business?
2. Do you operate a bulk plant? YES NO
3. What percentage of your deliveries are made with proprietary trucks? _____%

Distribution Costs

1. On average, how much does it cost you to transport gasoline per mile? (include all costs) _____cents/gal.
2. In 1990, **for gasoline and/or diesel distribution to retail outlets only**, how was your **after tax margin** (sales price less buying price) broken down? Provide 1990 totals for each applicable category.

$_____	Profit	
$_____	Facility rent	(rent of distribution facility)
$_____	Loan payment	(on any loans pertaining to your distribution business)
$_____	Repair/Replacement	(for tank or truck replacement or maintenance)
$_____	Gov't fees	(any governmental fees for distribution/storage)
$_____	Supplier fees	(any fees paid to your supplier)
$_____	Wages & Benefits	(all employees employed with your distribution business.)
$_____	Insurance	(all insurance)
$_____	Other costs	(costs not listed above)
$_____	Total	TOTAL 1990 MARGIN

Prices

1. Do you receive a competitive price rebate from your supplier for deliveries to stations in competition with stations supplied by your supplier. YES NO
   If YES, describe the arrangement: _____
   _____
2. Do you have a discount or rebate arrangement (other than indicated in the previous question) with your supplier for gas or diesel? YES NO
   If YES, describe the arrangement: _____
   _____
3. Our **terminal purchase price** (*excluding taxes*) on the date closest, but prior, to **April 5** was:

   _____ cents/gallon premium unleaded
   _____ cents/gallon mid-grade unleaded
   _____ cents/gallon regular unleaded
   _____ cents/gallon regular leaded
   _____ cents/gallon diesel

Indicate date: _____ **Terminal Location:** _____ **Brand:** _____

--- Continue on Back ---

4. Circle the following cities in which you deliver gasoline or diesel to retail outlets.

Aberdeen	*Clarkston*	*Finley*	*Marietta*	*Pasco*	*Silver Lake*	*Vancouver*
Ahtanum	*Cosmopolis*	*Greenacres*	*Marysville*	*Port Angeles*	*Snohomish*	*Wenatchee*
Auburn	*Edmonds*	*Hoquiam*	*Mercer Island*	*Redmond*	*Spanaway*	*West Richland*
Bellevue	*Ellensburg*	*Kennewick*	*Millwood*	*Renton*	*Spokane*	*Yakima*
Bellingham	*Everett*	*Kent*	*Montesano*	*Richland*	*Sumner*	
Bothell	*Federal Way*	*Kirkland*	*Mountlake Terrace*		*Tacoma*	
Burien	*Ferndale*	*Lake Stevens*	*Moxee City*	*Seattle*	*Tukwila*	
Central Park	*Fife*	*Lynnwood*	*Opportunity*	*Selah*	*Union Gap*	

5. **Include a xeroxed copy of the delivery invoice/receipt** (for ***each retail outlet*** supplied in the above cities) for the gasoline delivered on the date closest, but prior, to **April 5.**

6. I would like proprietary information on this survey kept confidential: YES NO

Additional Comments: _____

_____

_____

_____

Thank You For Your Assistance.
Remember to include copies of receipts/invoices.

Send to: 809 Legion Way SE, Olympia, WA 98504 (206) 956-2074

Appendix C

STATEWIDE AND CITY MARKET DESCRIPTIONS

Appendix C Sub-table of Contencts

STATEWIDE AND CITY MARKET DESCRIPTIONS

This appendix briefly describes Washington's statewide market and the markets for each city area in the study (arranged alphabetically). Survey re~u1ts have been aggregated at both the state and city levels, and are displayed in tables following each market description. The statewide description is built from the 51 cities studied in Washington and may not reflect the state market as a whole.

Washington's Gasoline Distribution System

While the Cascades divide Washington geographically into two parts, the distribution of refined petroleum products more realistically takes place in three markets: Puget Sound, Southwest/Portland, and Eastern Washington.

Puget Sound

Each year, refined product exports and domestic shipments from Puget Sound are greater than imports and domestic receipts. Thus, from a volumetric perspective, Puget Sound consumers receive all of their gasoline from Washington refineries. However, in truth, some gasoline refined in Washington is exported, and some gasoline consumed in the state is imported.

Gasoline is distributed from Washington refineries by truck to local stations, through the Olympic Pipeline to various terminals (where it is further distributed by barge or truck), and by barge to Puget Sound ports (where trucks completed distribution). Gasoline shipped to the Puget Sound region from out-of state is delivered by truck from marine terminals.
The 416-mile Olympic Pipeline begins in Cherry Point, Washington, and delivers gasoline to Bayview, Renton, Seattle, SeaTac, Tacoma, Spanaway, and Olympia before continuing south to the Vancouver/Portland market. In 1990, the pipeline delivered 29 million barrels of gasoline to the Puget Sound region.

Southwest/Portland

Three Southwest Washington cities-Kalama, Longview, and Vancouver-have port facilities to handle refined products. Gasoline is both imported and exported.

The Olympic Pipeline delivers gasoline to a terminal in Vancouver. Trucks complete the distribution to ports or stations. The pipeline then crosses the Columbia and delivers gasoline to Linnton, Oregon and to Portland, Oregon. Trucks complete distribution in Portland, or cross back into Washington to deliver to Vancouver, Washington stations.

In 1990, Olympic Pipeline delivered 558,000 barrels of gasoline to Vancouver, and an additional 27.8 million barrels to Oregon.

Eastern Washington

East of the Cascades consumers receive gasoline from barges towed up the Columbia and from two major pipelines, though some gasoline is also trucked from Western Washington, usually to cities on the Eastern slopes of the Cascades.

The Yellowstone Pipeline runs from Billings, Montana to Spokane, Washington. Gasoline is supplied from Conoco and Exxon refineries and the Cenex Yale Tankfarm located at Billings. Gasoline is delivered to terminals in Spokane, where a smaller pipeline runs to Fairchild Air Force Base (jet fuel only) and continues on to Moses Lake.

Chevron Pipeline runs from Salt Lake City, Utah through Idaho and Oregon to Pasco, Washington. The pipeline continues to Spokane, where it meets the Yellowstone Pipeline. Gasoline is supplied from Amoco, Chevron, and Flying J refineries in Salt Lake City, and from Crysen and Phillips refineries and the Pioneer Pipeline Terminal in Woods Cross, Utah. Gasoline is delivered to terminals in Pasco for distribution by truck, for further pumping to Spokane, or for loading on barges destined for Portland. During winter months, gasoline demand decreases in inland states and gasoline is transported west to California cities and to Portland.

Barges towed up the Columbia deliver gasoline originally from Puget Sound refineries through the Olympic Pipeline or from California by barge, to terminals in Pasco for distribution by truck or for pumping to Spokane.

In 1990, the Yellowstone pipeline delivered 7.8 million barrels of gasoline to Spokane. Chevron Pipeline delivered 2.9 million barrels of gasoline to Pasco.

Statewide Market

Washington has a population of 4,660,700 and an average population density of 70.1 persons per square mile. During the decade of the 1980s, population increased 12.8 percent. Farmland currently comprises 37.9 percent of the total land area. Unemployment currently stands at 6.2 percent. Per-capita personal income in 1982 constant dollars increased from $12,385 in 1980 to $13,227 in 1988. Total retail sales per-capita in constant 1982 dollars increased 11.9 percent during the decade.

Nineteen-ninety was a year of significant flux in Washington's gasoline markets. Of the 750 retail gasoline stations in the WSEO Petroleum Pricing Database 110, or 16.5 percent, permanently closed during the study. Sixty-six stations, or 8.8 percent, closed temporarily during the study, commonly for underground storage tank replacement. In all, 23 percent of the stations were closed at some point between Apri11990 and June 1991.[1]

Apart from station closures, 60 stations, or 9 percent, changed brands between July 1990 and June 1991. A large percentage of these brand changes is attributable to the sale of all Shell stations in King, Pierce, and Snohomish counties to Texaco in 1991. Approximately three quarters of Washington's retail outlets sell under a major refiner brand.

Increasingly, retail outlets appear to be providing alternative services. In all, only eight, or 2 percent of retail outlets, provide no additional customer services. The most common additional service provided is the convenience store, representing 54 percent of state retail outlets. In addition, a large number, 41.4 percent, are open 24 hours a day, 7 days a week. The state market also appears to be undergoing a transformation from split island (full-and self-serve) to self-serve only stations.

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[1] This information was generated using Lundberg Survey printed materials, which identified why prices were not available for a particular station. No data were collected if a station was "closed - torn down," "closed - deactivated - no brand displayed," "closed - miscellaneous / temporary," and "closed - brand displayed." Stations identified as "closed - miscellaneous / temporary" were categorized as "temporarily Closed Operations During Study," all others are classified as "Permanently Closed Operations During Study."

Overall, 65 percent of retail outlets in the state are supplied by oil companies, leaving 35 percent supplied by independent distributors. The large percentage of oil-company-supplied stations is clearly driven by the Seattle metropolitan area where only 19 stations, or 11.6 percent, reported purchasing from an independent distributor. Statewide, the percentage of stations supplied directly by oil companies varies widely. Four metropolitan areas have over 60 percent direct supplied stations and two areas have less than 20 percent direct-supplied stations.

In terms of supply reliability, 61 percent of retail outlets have contracts for some percentage of their supply with their suppliers. On the other hand, independent distributors, on average, have contracts for only 51 percent of their expected retail demand. In other words, 49 percent of the product supplied by independent distributors to retail outlets is purchased on an availability basis at the terminal. This has implications for supply security during times of tight supply.

Supplier-offered discounts are typically very difficult to track. They are often made on a monthly basis and can apply to station rent, volumes, or be related to signs or other company identification at the station. This complexity is compounded by a lack of continuity, as WSEO was occasionally notified of short-term discount programs. Discounts tend to concentrate in Seattle. Over half, 56 percent, of Seattle stations received discounts as compared to none in Aberdeen, 7 percent in Yakima, and 10 percent in Port Angeles. On average 34 percent of all stations received some type of supplier discount during the year. Oil companies provide more numerous discounts than distributors, providing almost 43 percent of direct service stations with discounts versus 15 percent for distributor supplied stations.

TABLE 1
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	739	100.0	667	100.0
Sell Regular Leaded	675	91.3	621	93.1
Sell Regular Unleaded	735	99.5	664	99.6
Sell Midgrade Unleaded	54	7.3	34	5.1
Sell Premium Unleaded	673	91.1	612	91.8
Sell Diesel	157	21.2	157	23.5
Station Brands				
Major Refiner Brand	541	73.2	491	73.6
Not Major Refiner Brand	198	26.8	175	26.2
ARCO Brand	60	8.1	58	8.7
BP Brand	47	6.4	45	6.7
Cenex Brand	8	1.1	10	1.5
Chevron Brand	94	12.7	85	12.7
Conoco Brand	35	4.7	35	5.2
Exxon Brand	66	8.9	62	9.3
Shell Brand	70	9.5	33	4.9
Texaco Brand	105	14.2	127	19.0
Unocal Brand	56	7.6	36	5.4
Citgo (including 7-Eleven)	41	5.5	40	6.0
Changed Brand During Study Period*			60	9.0
Permanently Closed Operations During Study*			110	16.5
Temporarily Closed Operations During Study*			66	9.9
Service Type				
Full Service Only	28	3.8	21	3.1
Self Service Only	470	63.6	461	69.1
Split Island	241	32.6	184	27.6
Sell Gasoline Only (No Diesel)	582	78.8	510	76.5
Sell for Cash Only	257	34.8	231	34.6
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	482	65.2	435	65.2

* Station information on closures and brand changes is calculated from the entire database population of 750 retail outlets.

TABLE 1 (Continued)
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

750 Outlets in Pricing Database
459 Outlets Responding to Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	8	1.9
Has Alternative Profit Center	420	98.1
No Response	31	
Convenience Store	231	54.0
No Convenience Store	197	46.0
No Response	31	
Service Bays	148	34.7
No Service Bay	279	65.3
No Response	32	
Lub Bays	94	22.0
No Lub Bays	334	78.0
No Response	31	
Car Wash	49	11.4
No Car Wash	379	88.6
No Response	31	
Truck Stop	11	2.6
No Truck Stop	417	97.4
No Response	31	
Parking Garage	1	0.2
No Parking Garage	427	99.8
No Response	31	
Other	15	3.5
No Other	413	96.5
No Response	31	
Open 24 Hours - 7 Days a Week	146	41.4
Not Open 24 Hours - 7 Days a Week	207	58.6
No Response	106	

TABLE 1 (Continued)
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

750 Outlets in Pricing Database
459 Outlets Responding to Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	259	64.4
Supplied by Distributor	143	35.6
No Response	57	
Majors Supplied by Oil Company	199	68.9
Majors Supplied by Distributor	90	31.1
Not Applicable	99	
No Response	71	
Have Contracts with Suppliers	239	60.5
Have No Contracts With Suppliers	156	39.5
No Response	64	
Receive Some Discount from Supplier	150	34.2
Receive No Discount from Supplier	288	65.8
No Response	21	
Oil Company Supplied: Receive Discount	108	42.7
Oil Company Supplied: Receive No Discount	145	57.3
Not Applicable	143	
No Response	63	
Distributor Supplied: Receive Discount	21	15.4
Distributor Supplied: Receive No Discount	115	84.6
Not Applicable	259	
No Response	64	
Supplier Operated	73	16.7
Non-Supplier Operated	363	83.3
No Response	23	
Oil Company Operated	44	63.8
Distributor Operated	25	36.2
Not Applicable	346	
No Response	44	

TABLE 1 (Continued)
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

750 Outlets in Pricing Database
459 Outlets Responding to Survey

Market Characteristics

	Outlets	Percent Of Respondents		
*Alternative Fuels**				
Sell Alternative Fuel	38	15.1		
Sell Ethanol	12			
Sell Propane	27			
Sell Methanol	1			
Sell Natural Gas	3			
Sell No Alternative Fuel	214	84.9		
No Response	9			
Proximity to Major Roadway				
Located within 1 Mile of Major Roadway	277	66.1		
Located further than 1 mile of Major Roadway	142	33.9		
No Response	40			
Located within 1 Mile Non-Interstate Highway	123	49.0		
Located within 1 Mile of Interstate	128	51.0		
Not Applicable	150			
No Response	58			
Customer Classification				
Sell to at least 50% Tourists*	13	6.3		
Sell to less than 50% Tourists*	194	93.7		
No Response	119			
Sell to at least 50% Highway Traffic	34	9.8		
Sell to less than 50% Highway Traffic	314	90.2		
No Response	111			
		Average	Minimum	Maximum
Number of Employees Full Time*	217	4.8	0	25
Number of Employees Part Time*	217	2.1	0	13
No Response	67			

* Sample sizes vary due to the questions having been asked on a different quarterly survey.

TABLE 2
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

Average Prices July 1990 - June 1991

Prices	Average $/gal	Average Minimum $/gal	Average Maximum $/gal	Absolute Minimum $/gal	Absolute Maximum $/gal
All Grades of Gasoline					
Cash					
* Self Serve	1.249				
* Full Serve	1.583				
* Self and Full Serve Average	1.293				
Credit					
* Self Serve	1.290				
* Full Serve	1.604				
* Self and Full Serve Average	1.331				
Cash & Credit					
* Self Serve	1.257				
* Full Serve	1.584				
* Self and Full Serve Average [State Average]	1.300				
Leaded Regular					
Cash					
Self Serve	1.125	1.093	1.379	0.939	1.559
Full Serve	1.530	1.164	1.816	0.999	1.999
* Self and Full Serve Average	1.176				
Credit					
Self Serve	1.235	1.093	1.410	0.949	1.729
Full Serve	1.557	1.313	1.816	1.059	2.049
* Self and Full Serve Average	1.277				
Cash & Credit					
* Self Serve	1.155				
* Full Serve	1.533				
* Self and Full Serve Average	1.203				
Unleaded Regular					
Cash					
Self Serve [variable used in study]	1.258	1.117	1.472	0.929	1.619
Full Serve	1.572	1.204	1.904	0.989	2.039
* Self and Full Serve Average	1.299				
Credit					
Self Serve	1.274	1.117	1.479	0.929	1.729
Full Serve	1.592	1.267	1.904	1.039	2.049
* Self and Full Serve Average	1.316				
Cash & Credit					
Self Serve	1.258				
Full Serve	1.572				
* Self and Full Serve Average	1.300				

* Indicates the average price is a calculated price based on sales percentages provided on WSEO sureys.
89.61% Self Serve, 10.95% Full Serve.
68.36% Cash, 31.27% Credit.
24.08% regular leaded, 58.47% unleaded regular, .5% mid-grade and 17.24% premium.

Note: Average Maximum and Average Minimum refer to the highest and lowest twelve month average Volume. Absolute Maximum and Absolute Minimum refer to the highest and lowest volumes for one month.

TABLE 2 (Continued)
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

Average Prices July 1990 - June 1991

Prices	Average $/gal	Average Minimum $/gal	Average Maximum $/gal	Absolute Minimum $/gal	Absolute Maximum $/gal
Unleaded Midgrade					
Cash					
Self Serve	1.339	1.263	1.454	1.089	1.689
Full Serve	1.641	1.493	1.891	1.329	1.999
* Self and Full Serve Average	1.380				
Credit					
Self Serve	1.339	1.263	1.454	1.089	1.689
Full Serve	1.641	1.493	1.891	1.329	1.999
* Self and Full Serve Average	1.380				
Cash & Credit					
Self Serve	1.334				
Full Serve	1.635				
* Self and Full Serve Average	1.374				
Unleaded Premium					
Cash					
Self Serve	1.394	1.257	1.592	1.019	1.779
Full Serve	1.692	1.317	1.984	1.019	2.169
* Self and Full Serve Average	1.434				
Credit					
Self Serve	1.419	1.257	1.642	1.059	1.859
Full Serve	1.713	1.367	1.984	1.069	2.169
* Self and Full Serve Average	1.459				
Cash & Credit					
Self Serve	1.397				
Full Serve	1.692				
* Self and Full Serve Average	1.437				
Diesel					
Cash					
Self Serve	1.366	1.208	1.496	0.999	1.749
Full Serve	1.577	1.328	1.807	0.999	1.989
* Self and Full Serve Average	1.397				
Credit					
Self Serve	1.392	1.208	1.540	0.999	1.799
Full Serve	1.604	1.398	1.807	0.999	1.989
* Self and Full Serve Average	1.423				
Cash & Credit					
Self Serve	1.369				
Full Serve	1.580				
* Self and Full Serve Average	1.400				

* Indicates the average price is a calculated price based on sales percentages provided on WSEO sureys.
89.61% Self Serve, 10.95% Full Serve.
68.36% Cash, 31.27% Credit.
24.08% regular leaded, 58.47% unleaded regular, .5% mid-grade and 17.24% premium.

Note: Average Maximum and Average Minimum refer to the highest and lowest twelve month average Volume. Absolute Maximum and Absolute Minimum refer to the highest and lowest volumes for one month.

TABLE 2 (Continued)
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

Average Prices July 1990 - June 1991

Prices	Average $/gal	Average Minimum $/gal	Average Maximum $/gal	Absolute Minimum $/gal	Absolute Maximum $/gal
Unleaded Regular Self Serve Cash	1.257	1.154	1.472	0.929	1.619
Major Refiner Brand	1.252	1.154	1.472	0.929	1.619
ARCO Brand	1.203	1.154	1.367	0.999	1.499
BP Brand	1.234	1.176	1.347	0.999	1.489
Cenex Brand	1.258	1.219	1.299	1.019	1.599
Chevron Brand	1.254	1.197	1.472	0.999	1.529
Conoco Brand	1.271	1.221	1.336	0.999	1.559
Exxon Brand	1.257	1.179	1.358	1.059	1.619
Shell Brand	1.273	1.209	1.352	1.059	1.619
Texaco Brand	1.276	1.188	1.429	0.999	1.619
Unocal Brand	1.238	1.176	1.325	0.929	1.549
Oil Company Supplied	1.244	1.156	1.472	0.929	1.599
Distributor Supplied	1.285	1.190	1.389	0.999	1.619
Oil Company Operated	1.232	1.170	1.336	0.979	1.529
Distributor Operated	1.274	1.225	1.322	1.049	1.519
Non-Supplier Operated	1.261	1.156	1.389	0.929	1.619
Receive Some Discount from Supplier	1.241	1.170	1.351	0.979	1.619
Receive No Discount from Supplier	1.269	1.156	1.389	0.929	1.599
Located within 1 Mile of Major Roadway	1.263	1.170	1.389	0.999	1.569
Located More than 1 Mile from Major Roadway	1.256	1.156	1.352	0.929	1.619
50% or More Sales to Tourists	1.298	1.191	1.351	1.039	1.569
Less than 50% Sales to Tourists	1.258	1.156	1.358	0.979	1.599
50% or More Sales to Highway Traffic	1.281	1.177	1.389	0.999	1.599
Less than 50% Sales to Highway Traffic	1.258	1.162	1.369	0.989	1.599
Open 24 Hours - 7 Days a Week	1.254	1.170	1.358	0.979	1.539
Not Open 24 Hours - 7 Days a Week	1.265	1.162	1.389	0.989	1.599
Convenience Store	1.258	1.162	1.389	0.979	1.619
Not Convenience Store	1.261	1.156	1.364	0.929	1.569

* Average Maximum and Average Minimum refer to the highest and lowest twelve month average price. Absolute Maximum and Absolute Minimum refer to the highest and lowest monthly prices at one station.

Note: These prices have been calculated by the Washington State Energy Office and do not reflect Lundberg Survey Inc. methodology. Neither the use of the data nor any interpretation of the price survey findings reflect the analysis or the opinions of Lundberg Survey Inc.

TABLE 3
Gasoline Prices Study - Statewide Data Results
Retail Outlet Data
June 30, 1991

Average May 1990 - Dec 1990

Volumes	Average Gallons	Average Minimum Gallons	Average Maximum Gallons	Absolute Minimum Gallons	Absolute Maximum Gallons
8 Month Volume 1990	87,746	1,672	300,000	1,098	439,878
Major Refiner Brand	96,416	1,672	300,000	1,486	439,878
ARCO Brand	170,180	24,000	300,000	2,051	439,878
BP Brand	91,333	7,645	175,000	6,768	275,000
Cenex Brand	57,635	25,000	87,968	15,661	127,431
Chevron Brand	101,052	7,212	194,669	6,203	300,000
Conoco Brand	31,452	14,771	50,000	7,402	193,144
Exxon Brand	74,083	17,023	200,000	11,811	210,000
Shell Brand	97,230	13,091	168,751	11,600	186,200
Texaco Brand	58,014	1,672	140,000	1,486	168,740
Unocal Brand	102,656	1,900	290,000	5,000	417,000
Oil Company Supplied	110,878	1,900	300,000	2,500	439,878
Distributor Supplied	49,805	1,672	168,751	1,098	416,800
Oil Company Operated	135,985	25,000	290,032	11,600	347,367
Distributor Operated	83,111	17,500	168,751	15,000	186,200
Non-Supplier Operated	82,257	1,672	300,000	1,098	439,878
Receive Some Discount from Supplier	111,624	1,900	290,032	1,486	417,000
Receive No Discount from Supplier	74,436	1,672	300,000	1,098	439,878
Located within 1 Mile of Major Roadway	102,893	1,672	300,000	1,486	347,367
Located More than 1 Mile from Major Roadway	68,752	4,086	260,000	1,098	439,878
50% or More Sales to Tourists	79,800	44,430	194,669	32,848	232,600
Less than 50% Sales to Tourists	84,129	1,672	300,000	1,098	417,000
50% or More Sales to Highway Traffic	110,610	22,317	300,000	10,667	343,228
Less than 50% Sales to Highway Traffic	87,219	1,672	290,032	1,098	439,878
Open 24 Hours - 7 Days a Week	121,481	8,900	300,000	9,762	439,878
Not Open 24 Hours - 7 Days a Week	67,790	1,672	260,000	1,098	422,000
Convenience Store	103,504	4,086	300,000	1,098	439,878
Not Convenience Store	76,331	1,672	290,000	1,486	416,800

Note: Average Maximum and Average Minimum refer to the highest and lowest eight month average Volume. Absolute Maximum and Absolute Minimum refer to the highest and lowest monthly volumes at one station.

TABLE 4
Gasoline Prices Study - Statewide Data Results
Wholesale Data
June 30, 1991

Wholesale Market Description

	Companies	Percent of Supplier Respondents		
Oil Companies Who Responded to WSEO Surveys	10	50.0		
Oil Companies Who Did Not Respond to Surveys	10	50.0		
Distributors Who Responded to WSEO Surveys	131	65.5		
Distributors Who Did Not Respond to Surveys	69	34.5		
Suppliers Who Distribute:				
Gasoline	122	93.1		
Leaded Regular	120	91.6		
Unleaded Regular	117	89.3		
Unleaded Midgrade	15	11.5		
Unleaded Premium	112	85.5		
Diesel	118	90.1		
No Response	10			
Suppliers Who Sell:				
To Wholesalers Only	3	2.3		
Some To Wholesalers	107	81.7		
To Retailers Only	3	2.3		
Some To Retailers	112	85.5		
To Municipalities	76	58.0		
To Agriculture	102	77.9		
To Fleets	71	54.2		
To Other End Users	27	20.6		
No Response	11			
Distributors Who:				
Have Contract With Supplier	104	86.0		
Have No Contract With Supplier	17	14.0		
No Response	10			
Have Branded Contracts With Suppliers	94	90.4		
Have Only Branded Contracts With Suppliers	59	56.7		
Have Unbranded Contracts With Suppliers	40	38.5		
Have Only Unbranded Contracts With Suppliers	5	4.8		
Not Applicable	17			
No Response	6			
Have Contracts for at least 50% of Retail Demand	36	42.4		
Have Contracts for less than 50% of Retail Demand.	49	57.6		
No Response	19			
Average Percentage of Retail Demand		Mean	Min	Max
Guaranteed by Contract	94	50.8	0	100

Aberdeen

Aberdeen is representative of a gasoline market in a rural area. For the study, the Aberdeen area is comprised of five cities: Aberdeen, Central Park, Cosmopolis, Hoquiam, and Montesano, which are located in Southwest Washington in Grays Harbor County. Grays Harbor County is Washington's 13th largest with a population of 63,600 in 1989, and has nine cities or towns with populations over 500. Population density currently stands at 33.2 persons per square mile, ranking 17th among Washington counties.

During the 1980s, Grays Harbor County decreased in population 4.1 percent, losing population faster than 33 other counties in the state. Net migration out of the county was even greater at 9 percent. Unemployment in the county ranks as the 10th highest in Washington at 10.3 percent.
Per-capita personal income currently stands at $11,126, and Grays Harbor has moved from 15th in personal income to 26th in the past decade. Total retail sales per-capita decreased 47.4 percent over the same period. Only one other county has a poorer retail sales growth record than Grays Harbor.

There are currently 29 gasoline stations in the WSEO Petroleum Pricing Database from the Aberdeen area, representing 4 percent of the total number of stations in the database. Twenty stations, or 69 percent, responded to the WSEO survey.

Thirteen stations, or 65 percent of respondents, are convenience stores. However, two of the eight stations in the state that have no alternative profit center are located in Aberdeen. Seven stations, or 35 percent, are operated by their supplier. Almost all of the Aberdeen stations are located within 1 mile of a major highway.

For the 1 year study period, Aberdeen area stations had the third lowest gasoline prices of cities in the study. Its transportation costs were just above the state average. Dealer margins were the third highest in the study, also just above the state average. Aberdeen area stations had the second lowest average sales volume per station at about 43,000 gallons. The Aberdeen area had the lowest vehicle density of any city in the study, at about 1,000 vehicles per square mile. About 65 percent of stations in the area offered discounts for cash purchases. Almost 60 percent of the stations were supplied directly by oil companies. Aberdeen tied with Yakima for the fourth highest average wholesale prices in the study.

The offer of cash discounts and the above average number of oil-company-supplied stations in the Aberdeen area is pushing prices down. Above average transportation costs, high dealer margins, low sales volumes, very low market demand (measured as vehicles per square mile), and higher than average wholesale prices are pushing prices up. With the exception of the greater number of discounts for cash purchases, every other variable is pushing prices higher than Seattle.

TABLE 5
Gasoline Prices Study - Aberdeen Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	28	100.0	27	100.0
Sell Regular Leaded	27	96.4	25	92.6
Sell Regular Unleaded	28	100.0	27	100.0
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	24	85.7	24	88.9
Sell Diesel	4	14.3	3	11.1
Station Brands				
Major Refiner Brand	15	53.6	14	51.9
Not Major Refiner Brand	13	46.4	13	48.1
ARCO Brand	0	0.0	1	3.7
BP Brand	2	7.1	1	3.7
Cenex Brand	1	3.6	1	3.7
Chevron Brand	2	7.1	2	7.4
Conoco Brand	0	0.0	0	0.0
Exxon Brand	1	3.6	1	3.7
Shell Brand	4	14.3	4	14.8
Texaco Brand	4	14.3	4	14.8
Unocal Brand	1	3.6	0	0.0
Citgo (including 7-Eleven)	6	21.4	6	22.2
Changed Brand During Study Period			0	0.0
Permanently Closed Operations During Study			6	20.7
Temporarily Closed Operations During Study			1	3.4
Service Type				
Full Service Only	1	3.6	1	3.7
Self Service Only	23	82.1	21	77.8
Split Island	4	14.3	5	18.5
Sell Gasoline Only (No Diesel)	24	85.7	25	92.6
Sell for Cash Only	16	57.1	14	51.9
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	12	42.9	13	48.1

TABLE 5 (Continued)
Gasoline Prices Study - Aberdeen Metropolitan Data Results
Retail Outlet Data — 29 Stations in Pricing Database
June 30, 1991 — 20 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	2	10.5
Has Alternative Profit Center	17	89.5
No Response	1	
Convenience Store	13	68.4
No Convenience Store	6	31.6
No Response	1	
Service Bays	2	10.5
No Service Bays	17	89.5
No Response	1	
Lub Bays	3	15.8
No Lub Bays	16	84.2
No Response	1	
Car Wash	3	15.8
No Car Wash	16	84.2
No Response	1	
Truck Stop	0	0.0
No Truck Stop	19	100.0
No Response	1	
Parking Garage	0	0.0
No Parking Garage	19	100.0
No Response	1	
Other	0	0.0
No Other	19	100.0
No Response	1	
Open 24 Hours - 7 Days a Week	8	42.1
Not Open 24 Hours - 7 Days a Week	11	57.9
No Response	1	

TABLE 5 (Continued)
Gasoline Prices Study - Aberdeen Metropolitan Data Results
Retail Outlet Data — 29 Stations in Pricing Database
June 30, 1991 — 20 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	8	44.4
Supplied by Distributor	10	55.6
No Response	2	
Majors Supplied by Oil Company	1	12.5
Majors Supplied by Distributor	7	87.5
Not Applicable	9	
No Response	3	
Have Contracts with Suppliers	9	50.0
Have No Contracts With Suppliers	9	50.0
No Response	2	
Receive Some Discount from Supplier	0	0.0
Receive No Discount from Supplier	18	100.0
No Response	2	
Oil Company Supplier: Receive Discount	0	0.0
Oil Company Supplier: Receive No Discount	7	100.0
Not Applicable	10	
No Response	3	
Distributor Supplier: Receive Discount	0	0.0
Distributor Supplier: Receive No Discount	9	100.0
Not Applicable	8	
No Response	3	
Supplier Operated	7	35.0
Non-Supplier Operated	13	65.0
No Response	0	
Oil Company Operated	1	14.3
Distributor Operated	6	85.7
Not Applicable	11	
No Response	2	

TABLE 5 (Continued)
Gasoline Prices Study - Aberdeen Metropolitan Data Results
Retail Outlet Data — 29 Stations in Pricing Database
June 30, 1991 — 20 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	2	25.0
Sell Ethanol	0	
Sell Propane	2	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	6	75.0
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	16	94.1
Located further than 1 mile of Major Roadway	1	5.9
No Response	3	
Located within 1 Mile Non-Interstate Highway	16	100.0
Located within 1 Mile of Interstate	0	0.0
Not Applicable	1	
No Response	3	
Customer Classification		
Sell to at least 50% Tourists*	0	0.0
Sell to less than 50% Tourists	6	100.0
No Response	0	
Sell to at least 50% Highway Traffic	2	11.1
Sell to less than 50% Highway Traffic	16	88.9
No Response	2	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	6	3.2	1	5
Number of Employees Part Time	6	0.8	0	2
No Response	0			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Bellingham

The Bellingham area is comprised of the cities of Bellingham, Ferndale and Marietta. Bellingham is located in Northwest Washington, in Whatcom County, and is the state's seventh largest city with a population of 47,290. The Port of Bellingham is the state's third largest port.

Whatcom County is the state's ninth largest with a population of 122,200. Population density is 57.5 persons per square mile, 11th highest in the state. Whatcom County experienced relatively rapid growth during the 1980s. The county as a whole grew 14.5 percent. By 1989 just under 8 percent of the county inhabitants had migrated into the county during the decade. Whatcom County has increased its standing in per-capita personal income from 28th in the state to 24th, where it currently stands at $11,205. Total retail sales per-capita have grown found fastest in the state over the decade, increasing some 24.7 percent.

There are currently 49 gasoline stations in the WSEO Petroleum Pricing Database in the Bellingham area. Thirty nine stations responded to the WSEO survey. Bellingham's concern over statewide price differentials is heightened due to its location near Washington State refineries. It would seem that Bellingham should have low gasoline prices considering Bellingham's proximity to the four major petroleum refineries in the state. However, Bellingham area stations had the fourth highest prices of cities in the study.

As expected, Bellingham has some of the lowest transportation costs in the state, very close and second only to Seattle. Both require trucking from terminals, but the trucking distance is further from terminals to Bellingham stations than from terminals to Seattle stations. Pipeline costs are so low that the additional distance traversed by pipeline from refineries to Seattle is less than the additional distance traveled by truck from Anacortes to Bellingham. Still, Bellingham has very low transportation costs. Bellingham stations reported the fifth highest dealer margins in the study, with distributor-supplied stations receiving about a penny more per gallon than oil company-supplied stations. Bellingham stations sold on average about 80,000 gallons per month, about third highest in the study, on a par with Spokane and Vancouver. Bellingham sports a fairly low vehicle density, about 2,500 per square mile, fourth lowest in the study. Like Aberdeen, about 65 percent of the stations offer discounts for cash sales. Unlike Aberdeen, only about 35 percent of the stations are supplied by oil companies. In addition, Bellingham is less than 30 miles from Canada, and is a major stopping point for tourists traveling to or from the Canadian border. Bellingham had the third highest wholesale prices in the study.

Low transportation costs, and the offer of cash discounts work to lower gasoline prices at Bellingham stations. Average sales volumes work toward average prices. Above average dealer margins, low vehicle density, a large number of distributor-supplied stations, Bellingham's proximity to Canada, and higher than average wholesale prices all work to increase prices in the area. Like Aberdeen, all variables except for cash discounts work to push prices higher than Seattle.

TABLE 6
Gasoline Prices Study - Bellingham Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	49	100.0	44	100.0
Sell Regular Leaded	45	91.8	40	90.9
Sell Regular Unleaded	48	98.0	44	100.0
Sell Midgrade Unleaded	2	4.1	2	4.5
Sell Premium Unleaded	44	89.8	42	95.5
Sell Diesel	15	30.6	13	29.5
Station Brands				
Major Refiner Brand	37	75.5	37	84.1
Not Major Refiner Brand	12	24.5	7	15.9
ARCO Brand	1	2.0	2	4.5
BP Brand	7	14.3	7	15.9
Cenex Brand	0	0.0	0	0.0
Chevron Brand	4	8.2	3	6.8
Conoco Brand	0	0.0	0	0.0
Exxon Brand	8	16.3	7	15.9
Shell Brand	5	10.2	5	11.4
Texaco Brand	9	18.4	10	22.7
Unocal Brand	3	6.1	3	6.8
Citgo (including 7-Eleven)	2	4.1	2	4.5
Changed Brand During Study Period			2	4.1
Permanently Closed Operations During Study			4	8.2
Temporarily Closed Operations During Study			4	8.2
Service Type				
Full Service Only	3	6.1	3	6.8
Self Service Only	32	65.3	30	68.2
Split Island	14	28.6	11	25.0
Sell Gasoline Only (No Diesel)	34	69.4	31	70.5
Sell for Cash Only	18	36.7	10	22.7
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	31	63.3	34	77.3

TABLE 6 (Continued)
Gasoline Prices Study - Bellingham Metropolitan Data Results
Retail Outlet Data — 49 Stations in Pricing Database
June 30, 1991 — 39 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	1	2.7
Has Alternative Profit Center	36	97.3
No Response	2	
Convenience Store	22	59.5
No Convenience Store	15	40.5
No Response	2	
Service Bays	11	29.7
No Service Bays	26	70.3
No Response	2	
Lub Bays	8	21.6
No Lub Bays	29	78.4
No Response	2	
Car Wash	3	8.1
No Car Wash	34	91.9
No Response	2	
Truck Stop	1	2.7
No Truck Stop	36	97.3
No Response	2	
Parking Garage	0	0.0
No Parking Garage	37	100.0
No Response	2	
Other	3	8.1
No Other	34	91.9
No Response	2	
Open 24 Hours - 7 Days a Week	9	31.0
Not Open 24 Hours - 7 Days a Week	20	69.0
No Response	10	

TABLE 6 (Continued)
Gasoline Prices Study - Bellingham Metropolitan Data Results
Retail Outlet Data — 49 Stations in Pricing Database
June 30, 1991 — 39 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	12	32.4
Supplied by Distributor	25	67.6
No Response	2	
Majors Supplied by Oil Company	10	34.5
Majors Supplied by Distributor	19	65.5
Not Applicable	9	
No Response	1	
Have Contracts with Suppliers	12	34.3
Have No Contracts With Suppliers	23	65.7
No Response	4	
Receive Some Discount from Supplier	9	23.7
Receive No Discount from Supplier	29	76.3
No Response	1	
Oil Company Supplier: Receive Discount	4	33.3
Oil Company Supplier: Receive No Discount	8	66.7
Not Applicable	25	
No Response	2	
Distributor Supplier: Receive Discount	1	4.2
Distributor Supplier: Receive No Discount	23	95.8
Not Applicable	12	
No Response	3	
Supplier Operated	9	23.7
Non-Supplier Operated	29	76.3
No Response	1	
Oil Company Operated	2	22.2
Distributor Operated	7	77.8
Not Applicable	29	
No Response	1	

TABLE 6 (Continued)
Gasoline Prices Study - Bellingham Metropolitan Data Results
Retail Outlet Data — 49 Stations in Pricing Database
June 30, 1991 — 39 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	6	25.0
Sell Ethanol	0	
Sell Propane	6	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	18	75.0
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	26	72.2
Located further than 1 mile of Major Roadway	10	27.8
No Response	3	
Located within 1 Mile Non-Interstate Highway	6	23.1
Located within 1 Mile of Interstate	20	76.9
Not Applicable	10	
No Response	3	
Customer Classification		
Sell to at least 50% Tourists*	4	14.8
Sell to less than 50% Tourists	23	85.2
No Response	2	
Sell to at least 50% Highway Traffic	4	14.3
Sell to less than 50% Highway Traffic	24	85.7
No Response	11	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	27	3.6	0	9
Number of Employees Part Time	27	2.3	0	7
No Response	2			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

TABLE 6 (Continued)
Gasoline Prices Study - Bellingham Metropolitan Data Results
Retail Outlet Data — 49 Stations in Pricing Database
June 30, 1991 — 39 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	6	25.0
Sell Ethanol	0	
Sell Propane	6	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	18	75.0
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	26	72.2
Located further than 1 mile of Major Roadway	10	27.8
No Response	3	
Located within 1 Mile Non-Interstate Highway	6	23.1
Located within 1 Mile of Interstate	20	76.9
Not Applicable	10	
No Response	3	
Customer Classification		
Sell to at least 50% Tourists*	4	14.8
Sell to less than 50% Tourists	23	85.2
No Response	2	
Sell to at least 50% Highway Traffic	4	14.3
Sell to less than 50% Highway Traffic	24	85.7
No Response	11	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	27	3.6	0	9
Number of Employees Part Time	27	2.3	0	7
No Response	2			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Clarkston

The City of Clarkston, population of 6,710, is located in Asotin County in Southeast Washington near the Idaho border. Clarkston experienced a 3 percent decline in population during the 1980s, and is now the 49th largest city in Washington. Asotin County has the 29th largest county population in the state, at 17,600 persons. Population density is 19th in the state at 27.7 persons per square mile. The county is largely rural, comprised of 68 percent farmland. The county's unemployment level is the eighth lowest in the state, standing at 5.1 percent. Asotin County dropped from 26th to 27th in the state over the last decade in per-capita personal income, which now stands at $11,030. Total retail sales per-capita decreased 3.7 percent during the decade.

Nine retail gasoline outlets in Clarkston have been tracked in the WSEO Petroleum Pricing Database. One station closed during the year. Six stations responded to WSEO surveys. All six operate convenience stores, and one of the six is supplied by an oil company.

Clarkston had the fifth lowest gasoline prices in the state study. However, Clarkston had the highest transportation costs. Clarkston must be supplied from distant Spokane by truck, or by barge from Pasco. Either is fairly expensive. Clarkston, along with Seattle and Wenatchee, had the lowest dealer margins and the fourth lowest average monthly sales volumes in the study. Clarkston had a surprisingly high vehicle density, third highest in the study, at about 4,300 vehicles per square mile. Clarkston had the highest percentage, 80 percent, of stations offering discounts for cash sales, and the second highest percentage, also 80 percent, of stations supplied by distributor. Clarkston tied with Port Angeles for the second lowest wholesale prices in the study.

Low dealer margins, above average vehicle density, the offer of cash discounts, and lower than average wholesale prices work to lower prices in Clarkston. Very high transportation costs, fairly low sales volumes, and the high number of distributor-supplied stations work to push prices up in Clarkston. Three variables: dealer margins, the offer of cash discounts, and WSEO's estimated wholesale price for Clarkston work to push prices lower than Seattle. All other variables push prices higher than Seattle.

TABLE 7
Gasoline Prices Study - Clarkston Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	9	100.0	8	100.0
Sell Regular Leaded	9	100.0	8	100.0
Sell Regular Unleaded	9	100.0	8	100.0
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	6	66.7	5	62.5
Sell Diesel	1	11.1	1	12.5
Station Brands				
Major Refiner Brand	1	11.1	1	12.5
Not Major Refiner Brand	8	88.9	7	87.5
ARCO Brand	0	0.0	0	0.0
BP Brand	0	0.0	0	0.0
Cenex Brand	0	0.0	0	0.0
Chevron Brand	0	0.0	0	0.0
Conoco Brand	0	0.0	0	0.0
Exxon Brand	1	11.1	1	12.5
Shell Brand	0	0.0	0	0.0
Texaco Brand	0	0.0	0	0.0
Unocal Brand	0	0.0	0	0.0
Citgo (including 7-Eleven)	0	0.0	0	0.0
Changed Brand During Study Period			0	0.0
Permanently Closed Operations During Study			1	11.1
Temporarily Closed Operations During Study			0	0.0
Service Type				
Full Service Only	0	0.0	0	0.0
Self Service Only	9	100.0	8	100.0
Split Island	0	0.0	0	0.0
Sell Gasoline Only (No Diesel)	8	88.9	7	87.5
Sell for Cash Only	7	77.8	6	75.0
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	2	22.2	2	25.0

TABLE 7 (Continued)
Gasoline Prices Study - Clarkston Metropolitan Data Results
Retail Outlet Data
June 30, 1991

9 Stations in Pricing Database
6 Stations Returned Survey

Market Characteristics

Service Type	Outlets	Percent Of Respondents
No Alternative Profit Center	0	0.0
Has Alternative Profit Center	6	100.0
No Response	0	
Convenience Store	6	100.0
No Convenience Store	0	0.0
No Response	0	
Service Bays	0	0.0
No Service Bays	6	100.0
No Response	0	
Lub Bays	1	16.7
No Lub Bays	5	83.3
No Response	0	
Car Wash	2	33.3
No Car Wash	4	66.7
No Response	0	
Truck Stop	0	0.0
No Truck Stop	6	100.0
No Response	0	
Parking Garage	0	0.0
No Parking Garage	6	100.0
No Response	0	
Other	1	16.7
No Other	5	83.3
No Response	0	
Open 24 Hours - 7 Days a Week	2	40.0
Not Open 24 Hours - 7 Days a Week	3	60.0
No Response	1	

TABLE 7 (Continued)
Gasoline Prices Study - Clarkston Metropolitan Data Results
Retail Outlet Data
June 30, 1991

9 Stations in Pricing Database
6 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	1	16.7
Supplied by Distributor	5	83.3
No Response	0	
Majors Supplied by Oil Company	1	100.0
Majors Supplied by Distributor	0	0.0
Not Applicable	5	
No Response	0	
Have Contracts with Suppliers	2	40.0
Have No Contracts With Suppliers	3	60.0
No Response	1	
Receive Some Discount from Supplier	2	33.3
Receive No Discount from Supplier	4	66.7
No Response	0	
Oil Company Supplier: Receive Discount	0	0.0
Oil Company Supplier: Receive No Discount	1	100.0
Not Applicable	5	
No Response	0	
Distributor Supplier: Receive Discount	2	40.0
Distributor Supplier: Receive No Discount	3	60.0
Not Applicable	1	
No Response	0	
Supplier Operated	1	16.7
Non-Supplier Operated	5	83.3
No Response	0	
Oil Company Operated	0	0.0
Distributor Operated	1	100.0
Not Applicable	4	
No Response	1	

TABLE 7 (Continued)
Gasoline Prices Study - Clarkston Metropolitan Data Results
Retail Outlet Data — 9 Stations in Pricing Database
June 30, 1991 — 6 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	1	25.0
Sell Ethanol	1	
Sell Propane	0	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	3	75.0
No Response	2	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	5	83.3
Located further than 1 mile of Major Roadway	1	16.7
No Response	0	
Located within 1 Mile Non-Interstate Highway	5	100.0
Located within 1 Mile of Interstate	0	0.0
Not Applicable	1	
No Response	0	
Customer Classification		
Sell to at least 50% Tourists*	0	0.0
Sell to less than 50% Tourists	3	100.0
No Response	0	
Sell to at least 50% Highway Traffic	1	20.0
Sell to less than 50% Highway Traffic	4	80.0
No Response	1	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	3	4.0	2	6
Number of Employees Part Time	3	2.0	0	4
No Response	1			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Ellensburg

Ellensburg, with a population of 11,730, is the largest city in Kittitas County, located in central Washington on the east slope of the Cascades. Ellensburg has experienced out migration but on the whole the county population increased 2.1 percent during the 1980s. Kittitas County ranks 25th in population in the state with 25,400 persons, and has a population density of only 11 persons per square mile, 11th lowest in the state. Unemployment currently stands at 8.9 percent, 15th highest in the state. Over the past decade, Kittitas per-capita personal income ranking has changed little, and now stands 33rd, at $10,448. Over the same time period total retail sales per capita increased 10.1 percent, 14th fastest in the state.

The retail market is representative of a city located on a major interstate. Twenty-four Ellensburg stations are in the pricing database. Fourteen returned business characteristic information to WSEO. Ten, or 70 percent of these stations, operate a convenience store. Nearly 44 percent of the stations are within 1 mile of the interstate. Sixty percent of the stations make at least 50 percent of their sales to tourists. Fifty-six percent make at least 50 percent of their sales to highway traffic. Eighty-one percent of the stations are self service only, well above the state average of 69 percent.

Ellensburg had the second highest prices in the study. It has high transportation costs, similar to Wenatchee and second only to Clarkston. The city reported the second highest dealer margins. Monthly sales volumes in Ellensburg are average, fifth lowest in the study. It has a very low vehicle density, third lowest in the study. A majority of stations, over 55 percent, offer no discount for cash. Ellensburg has the second highest percentage of stations supplied by oil companies, just over 70 percent. Ellensburg recorded average wholesale prices.

The only factor pushing prices down in Ellensburg is the high percentage of oil-company supplied stations. All other variables, high transportation costs, high dealer margins, low sales volumes, a very low vehicle density, and the low number of stations offering discounts for cash all work to push prices up. In fact, no variables work to keep prices lower than Seattle, all work in the opposite direction.

TABLE 8
Gasoline Prices Study - Ellensburg Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	24	100.0	21	100.0
Sell Regular Leaded	23	95.8	21	100.0
Sell Regular Unleaded	24	100.0	21	100.0
Sell Midgrade Unleaded	1	4.2	0	0.0
Sell Premium Unleaded	19	79.2	18	85.7
Sell Diesel	8	33.3	6	28.6
Station Brands				
Major Refiner Brand	16	66.7	13	61.9
Not Major Refiner Brand	8	33.3	8	38.1
ARCO Brand	0	0.0	0	0.0
BP Brand	0	0.0	0	0.0
Cenex Brand	1	4.2	1	4.8
Chevron Brand	2	8.3	2	9.5
Conoco Brand	2	8.3	2	9.5
Exxon Brand	3	12.5	2	9.5
Shell Brand	3	12.5	2	9.5
Texaco Brand	4	16.7	4	19.0
Unocal Brand	1	4.2	0	0.0
Citgo (including 7-Eleven)	2	8.3	2	9.5
Changed Brand During Study Period			0	0.0
Permanently Closed Operations During Study			2	8.3
Temporarily Closed Operations During Study			1	4.2
Service Type				
Full Service Only	1	4.2	1	4.8
Self Service Only	17	70.8	17	81.0
Split Island	6	25.0	3	14.3
Sell Gasoline Only (No Diesel)	16	66.7	15	71.4
Sell for Cash Only	7	29.2	7	33.3
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	17	70.8	14	66.7

TABLE 8 (Continued)
Gasoline Prices Study - Ellensburg Metropolitan Data Results
Retail Outlet Data — 24 Stations in Pricing Database
June 30, 1991 — 14 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	0	0.0
Has Alternative Profit Center	13	100.0
No Response	2	
Convenience Store	9	69.2
No Convenience Store	4	30.8
No Response	2	
Service Bays	2	15.4
No Service Bays	11	84.6
No Response	2	
Lub Bays	0	0.0
No Lub Bays	13	100.0
No Response	2	
Car Wash	2	15.4
No Car Wash	11	84.6
No Response	2	
Truck Stop	1	7.7
No Truck Stop	12	92.3
No Response	2	
Parking Garage	0	0.0
No Parking Garage	13	100.0
No Response	2	
Other	1	7.7
No Other	12	92.3
No Response	2	
Open 24 Hours - 7 Days a Week	6	66.7
Not Open 24 Hours - 7 Days a Week	3	33.3
No Response	6	

TABLE 8 (Continued)
Gasoline Prices Study - Ellensburg Metropolitan Data Results
Retail Outlet Data
June 30, 1991

24 Stations in Pricing Database
14 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	8	61.5
Supplied by Distributor	5	38.5
No Response	2	
Majors Supplied by Oil Company	5	55.6
Majors Supplied by Distributor	4	44.4
Not Applicable	4	
No Response	2	
Have Contracts with Suppliers	5	41.7
Have No Contracts With Suppliers	7	58.3
No Response	3	
Receive Some Discount from Supplier	2	14.3
Receive No Discount from Supplier	12	85.7
No Response	1	
Oil Company Supplier: Receive Discount	1	12.5
Oil Company Supplier: Receive No Discount	7	87.5
Not Applicable	5	
No Response	2	
Distributor Supplier: Receive Discount	1	25.0
Distributor Supplier: Receive No Discount	3	75.0
Not Applicable	8	
No Response	3	
Supplier Operated	3	21.4
Non-Supplier Operated	11	78.6
No Response	1	
Oil Company Operated	3	100.0
Distributor Operated	0	0.0
Not Applicable	10	
No Response	2	

TABLE 8 (Continued)
Gasoline Prices Study - Ellensburg Metropolitan Data Results
Retail Outlet Data — 24 Stations in Pricing Database
June 30, 1991 — 14 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	2	33.3
Sell Ethanol	0	
Sell Propane	2	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	4	66.7
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	9	69.2
Located further than 1 mile of Major Roadway	4	30.8
No Response	2	
Located within 1 Mile Non-Interstate Highway	4	44.4
Located within 1 Mile of Interstate	5	55.6
Not Applicable	4	
No Response	2	
Customer Classification		
Sell to at least 50% Tourists*	3	60.0
Sell to less than 50% Tourists	2	40.0
No Response	1	
Sell to at least 50% Highway Traffic	5	55.6
Sell to less than 50% Highway Traffic	4	44.4
No Response	6	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	5	11.0	3	24
Number of Employees Part Time	5	1.0	0	5
No Response	1			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Port Angeles

Port Angeles is located on the Olympic Peninsula directly across the Strait of Juan de Fuca from Victoria, British Columbia. Numerous factors make Port Angeles and Clallam County a unique petroleum market in the state. The close proximity to .Canada and the difficult transportation route for moving supplies to the area are clearly two dominant features.

Clallam County has a population of 55,200, ranking 15th in the state, with a population density of 31.5 persons per square mile, 18th in the state. Population increased in the county during the last decade 6.9 percent, heavily supported by in-migration. While the community is largely rural, only 2.4 percent of the total area is comprised of farms. Nineteen percent of the county population is over 65 years of age. Unemployment currently stands at 8.5 percent, 18th in the state. Clallam County has risen in per-capita personal income ranking from 24th to 22nd during the 1980s, where it now stands at $11,359. Total retail sales per-capita also increased during the 1980s at 6.2 percent, 18th fastest in the state.

Thirteen retail gasoline stations are in the pricing database from Port Angeles. Eleven responded to the WSEO surveys. On the whole the retail market changed little during the year, no stations closed or changed brands. Every station is located within one mile of a major roadway; most are on the main road through the city. Few of the stations are open 24 hours a day, 7 days a week. Fifty percent are convenience stores and all have some type of alternative profit center. Only one station purchases from its supplier under contract.

Port Angeles reported the highest average retail prices in the study. Transportation costs are the fourth highest in the study, mainly because gasoline cannot be ferried. Port Angeles dealers reported the highest margins in the study, averaging 18 cents per gallon, at the same time reporting the smallest average sales volumes per station at fewer than 40,000 gallons per month. Port Angeles has an average vehicle density of about 3,000 vehicles per square mile. The city reported an equal number of stations offering discount for cash as not. All of the stations that responded to the WSEO survey are supplied by distributor. Port Angeles, like Bellingham, is also within 30 miles of the Canadian border and is a major stopping point for visitors going to or from Canada. Port Angeles tied with Clarkston for the second lowest wholesale prices in the study.

Only a smaller than average wholesale price works to keep the price low in Port Angeles. Cash discounts have no effect being divided equally between stations. The remaining variables, high transportation costs, high dealer margins, low sales volumes, below average vehicle density, the high number of distributor supplied stations, and the city's proximity to Canada all work to push prices up in Port Angeles. Except for a smaller than average wholesale price, all of the variables work to push prices higher than Seattle.

TABLE 9
Gasoline Prices Study - Port Angeles Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	13	100.0	13	100.0
Sell Regular Leaded	13	100.0	13	100.0
Sell Regular Unleaded	13	100.0	13	100.0
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	11	84.6	11	84.6
Sell Diesel	2	15.4	2	15.4
Station Brands				
Major Refiner Brand	11	84.6	11	84.6
Not Major Refiner Brand	2	15.4	2	15.4
ARCO Brand	0	0.0	0	0.0
BP Brand	1	7.7	1	7.7
Cenex Brand	0	0.0	0	0.0
Chevron Brand	1	7.7	1	7.7
Conoco Brand	0	0.0	0	0.0
Exxon Brand	2	15.4	2	15.4
Shell Brand	2	15.4	2	15.4
Texaco Brand	3	23.1	3	23.1
Unocal Brand	2	15.4	2	15.4
Citgo (including 7-Eleven)	0	0.0	0	0.0
Changed Brand During Study Period			0	0.0
Permanently Closed Operations During Study			0	0.0
Temporarily Closed Operations During Study			0	0.0
Service Type				
Full Service Only	0	0.0	0	0.0
Self Service Only	10	76.9	10	76.9
Split Island	3	23.1	3	23.1
Sell Gasoline Only (No Diesel)	11	84.6	11	84.6
Sell for Cash Only	5	38.5	4	30.8
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	8	61.5	9	69.2

TABLE 9 (Continued)
Gasoline Prices Study - Port Angeles Metropolitan Data Results
Retail Outlet Data — 13 Stations in Pricing Database
June 30, 1991 — 11 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	0	0.0
Has Alternative Profit Center	10	100.0
No Response	1	
Convenience Store	5	50.0
No Convenience Store	5	50.0
No Response	1	
Service Bays	0	0.0
No Service Bays	9	100.0
No Response	2	
Lub Bays	0	0.0
No Lub Bays	10	100.0
No Response	1	
Car Wash	2	20.0
No Car Wash	8	80.0
No Response	1	
Truck Stop	0	0.0
No Truck Stop	10	100.0
No Response	1	
Parking Garage	0	0.0
No Parking Garage	10	100.0
No Response	1	
Other	2	20.0
No Other	8	80.0
No Response	1	
Open 24 Hours - 7 Days a Week	2	22.2
Not Open 24 Hours - 7 Days a Week	7	77.8
No Response	2	

TABLE 9 (Continued)
Gasoline Prices Study - Port Angeles Metropolitan Data Results
Retail Outlet Data
June 30, 1991

13 Stations in Pricing Database
11 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	1	11.1
Supplied by Distributor	8	88.9
No Response	2	
Majors Supplied by Oil Company	1	16.7
Majors Supplied by Distributor	5	83.3
Not Applicable	3	
No Response	2	
Have Contracts with Suppliers	1	10.0
Have No Contracts With Suppliers	9	90.0
No Response	1	
Receive Some Discount from Supplier	1	9.1
Receive No Discount from Supplier	10	90.9
No Response	0	
Oil Company Supplier: Receive Discount	0	0.0
Oil Company Supplier: Receive No Discount	1	100.0
Not Applicable	8	
No Response	2	
Distributor Supplier: Receive Discount	0	0.0
Distributor Supplier: Receive No Discount	8	100.0
Not Applicable	1	
No Response	2	
Supplier Operated	1	10.0
Non-Supplier Operated	9	90.0
No Response	1	
Oil Company Operated	0	0.0
Distributor Operated	1	100.0
Not Applicable	8	
No Response	2	

TABLE 9 (Continued)
Gasoline Prices Study - Port Angeles Metropolitan Data Results
Retail Outlet Data
June 30, 1991

13 Stations in Pricing Database
11 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	0	0.0
Sell Ethanol	0	
Sell Propane	0	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	5	100.0
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	10	100.0
Located further than 1 mile of Major Roadway	0	0.0
No Response	1	
Located within 1 Mile Non-Interstate Highway	10	100.0
Located within 1 Mile of Interstate	0	0.0
Not Applicable	0	
No Response	1	
Customer Classification		
Sell to at least 50% Tourists*	0	0.0
Sell to less than 50% Tourists	7	100.0
No Response	1	
Sell to at least 50% Highway Traffic	2	22.2
Sell to less than 50% Highway Traffic	7	77.8
No Response	2	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time	7	3.7	3	6
Number of Employees Part Time	7	4.9	0	9
No Response	1			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

Seattle

The Seattle metropolitan area is clearly a unique market in Washington State. The counties that are at least partially included in the Seattle Metropolitan area, King, Pierce, and Snohomish counties, are the three largest in the state. Combined, their population totals nearly 2.5 million people. Snohomish is also the fastest growing county in the state, growing at 27.4 percent during the 1980s. Respectively, the three counties have population densities of 675.9, 334.9, and 205.1 persons per square mile, ranking first, fourth, and seventh in the state. Respectively, unemployment stands at 4.5, 6.3, and 4.9 percent, ranking 37th, 27th, and 33rd in the state. King County per-capita personal income maintained its number two ranking over the decade, where it now stands at $16,565. Pierce County moved from 21st to 15th and now stands at $11,776. Snohomish County moved from eighth to fifth, where it now stands at $13,308. Total retail sales per-capita increased respectively during the decade at 23.2, 17.3, and 28.4 percent. All were fast growing business areas.

For the study, the Seattle metropolitan area is comprised of the cities of Auburn, Bellevue, Bothell, Burien, Edmonds, Everett, Federal Way, Fife, Kent, Kirkland, Lake Stevens, Lynnwood, Marysville, Mercer Island, Millwood, Mountlake Terrace, Redmond, Renton, Seattle, Silverlake, Snohomish, Spanaway, Sumner, Tacoma, and Tukwila.

Three hundred ten, or 41.3 percent, of the 750 stations in the database are located in the Seattle Metropolitan area. Of the 310 stations in the database, 189 provided WSEO with business characteristics information.

The most dominant characteristic of the Seattle metropolitan area is the very high percentage of stations directly supplied by oil companies. Nearly 90 percent of the stations purchase gasoline directly from an oil company. Most major oil companies are well represented in the market with the exceptions of Cenex, Conoco, and more recently Shell.

Almost 22 percent of the Seattle stations in the database permanently closed between April 1990 and June 1991. The market also appears to be transforming from a split island dominated market to a self service only market.

In terms of overall business characteristics Seattle fairly well reflects the statewide market. One exception is the number of stations with service bays. Nearly 50 percent of the stations in Seattle have service bays compared to 35 percent statewide. The percentage of stations in Seattle with convenience stores is slightly less than the state average.

Nearly 70 percent of the Seattle stations maintain contracts with their suppliers. Fifty-six percent receive some discount from their suppliers. Sixty percent of the oil-company-supplied stations receive some discount compared to 22 percent of the independent-distributor-supplied stations. Sixteen and a half percent of the stations are operated by their supplier. Of these, 89 percent are operated by oil companies.

Seattle area stations posted the lowest prices in the study. Seattle has the lowest transportation costs, having several terminals located on the Olympic pipeline a fairly short distance from refineries. Total transportation costs averaged less than 2 cents per gallon. Seattle also reported the

lowest dealer margins, and far and away the highest sales volumes in the study. The two combined reflect the strong competitive nature of the Seattle area. Seattle has the second highest vehicle density in the study, about 4,800 vehicles per square mile, which is second only to Vancouver. About the same number of stations offers a discount for cash as do not. More than 90 percent of stations in the Seattle area are supplied directly by oil companies. It is clear that the oil companies see Seattle as the area in the state in which to focus marketing efforts. Seattle wholesale prices reflect the state average.

No market factors are at work pushing prices up in Seattle. Average wholesale prices, and the fifty-fifty split of stations offering cash discounts, work toward generating average prices. But every other variable works to keep prices low. Seattle has low transportation costs, low dealer margins, high sales volumes, high vehicle density, and the highest percentage of oil-company supplied stations in the state.

TABLE 10
Gasoline Prices Study - Seattle Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	298	100.0	259	100.0
Sell Regular Leaded	248	83.2	228	88.0
Sell Regular Unleaded	297	99.7	259	100.0
Sell Midgrade Unleaded	48	16.1	30	11.6
Sell Premium Unleaded	293	98.3	256	98.8
Sell Diesel	61	20.5	61	23.6
Station Brands				
Major Refiner Brand	278	93.3	241	93.1
Not Major Refiner Brand	20	6.7	18	6.9
ARCO Brand	43	14.4	38	14.7
BP Brand	35	11.7	34	13.1
Cenex Brand	0	0.0	0	0.0
Chevron Brand	50	16.8	46	17.8
Conoco Brand	0	0.0	0	0.0
Exxon Brand	21	7.0	21	8.1
Shell Brand	36	12.1	0	0.0
Texaco Brand	46	15.4	72	27.8
Unocal Brand	47	15.8	30	11.6
Citgo (including 7-Eleven)	8	2.7	7	2.7
Changed Brand During Study Period			43	13.9
Permanently Closed Operations During Study			67	21.6
Temporarily Closed Operations During Study			38	12.3
Service Type				
Full Service Only	15	5.0	10	3.9
Self Service Only	135	45.3	137	52.9
Split Island	148	49.7	112	43.2
Sell Gasoline Only (No Diesel)	237	79.5	198	76.4
Sell for Cash Only	60	20.1	56	21.6
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	238	79.9	203	78.4

TABLE 10 (Continued)
Gasoline Prices Study - Seattle Metropolitan Data Results
Retail Outlet Data
June 30, 1991

310 Stations in Pricing Database
189 Stations Returned Survey

Market Characteristics

Service Type	Outlets	Percent Of Respondents
No Alternative Profit Center	2	1.1
Has Alternative Profit Center	176	98.9
No Response	11	
Convenience Store	81	45.5
No Convenience Store	97	54.5
No Response	11	
Service Bays	87	48.9
No Service Bays	91	51.1
No Response	11	
Lub Bays	53	29.8
No Lub Bays	125	70.2
No Response	11	
Car Wash	20	11.2
No Car Wash	158	88.8
No Response	11	
Truck Stop	1	0.6
No Truck Stop	177	99.4
No Response	11	
Parking Garage	0	0.0
No Parking Garage	178	100.0
No Response	11	
Other	1	0.6
No Other	177	99.4
No Response	11	
Open 24 Hours - 7 Days a Week	66	43.7
Not Open 24 Hours - 7 Days a Week	85	56.3
No Response	38	

TABLE 10 (Continued)
Gasoline Prices Study - Seattle Metropolitan Data Results
Retail Outlet Data — 310 Stations in Pricing Database
June 30, 1991 — 217 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	145	88.4
Supplied by Distributor	19	11.6
No Response	25	
Majors Supplied by Oil Company	139	89.7
Majors Supplied by Distributor	16	10.3
Not Applicable	9	
No Response	25	
Have Contracts with Suppliers	118	69.8
Have No Contracts With Suppliers	51	30.2
No Response	20	
Receive Some Discount from Supplier	105	56.1
Receive No Discount from Supplier	82	43.9
No Response	2	
Oil Company Supplier: Receive Discount	86	59.7
Oil Company Supplier: Receive No Discount	58	40.3
Not Applicable	19	
No Response	26	
Distributor Supplier: Receive Discount	4	22.2
Distributor Supplier: Receive No Discount	14	77.8
Not Applicable	145	
No Response	26	
Supplier Operated	30	16.5
Non-Supplier Operated	152	83.5
No Response	7	
Oil Company Operated	25	89.3
Distributor Operated	3	10.7
Not Applicable	152	
No Response	9	

TABLE 10 (Continued)
Gasoline Prices Study - Seattle Metropolitan Data Results
Retail Outlet Data — 310 Stations in Pricing Database
June 30, 1991 — 217 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	10	9.7
Sell Ethanol	1	
Sell Propane	8	
Sell Methanol	1	
Sell Natural Gas	3	
Sell No Alternative Fuel	93	90.3
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	124	70.9
Located further than 1 mile of Major Roadway	51	29.1
No Response	14	
Located within 1 Mile Non-Interstate Highway	50	45.0
Located within 1 Mile of Interstate	61	55.0
Not Applicable	51	
No Response	27	
Customer Classification		
Sell to at least 50% Tourists*	2	2.5
Sell to less than 50% Tourists	77	97.5
No Response	48	
Sell to at least 50% Highway Traffic	12	8.0
Sell to less than 50% Highway Traffic	138	92.0
No Response	39	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	86	5.0	0	14
Number of Employees Part Time	86	2.2	0	7
No Response	41			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Spokane

Spokane is located in Spokane County near the Idaho border in the central part of the state. Spokane is the second largest city in the state with 170,700 people. Spokane County is the fourth largest county in the state, with a population of 358,000, and a population density of 202.9 persons per square mile, eighth highest in the state. Spokane County increased in population by 4.7 percent during the last decade. In-migration accounted for almost 2 percent of that growth. Though Spokane is a sizable urban city, Spokane County is 54 percent farmland, ranked 14th in the state. Unemployment currently stands at 6.5 percent, 26th in the state. Spokane has increased its ranking in per-capita personal income from 23rd to 17th over the last decade, where it now stands at $11,545. Total retail sales per capita increased less than four tenths of one percent over the decade, ranking 20th in the state.

Cities included in the Spokane area database include Greenacres, Opportunity and Spokane.

There are currently 117 gasoline stations in the WSEO Petroleum Pricing Database from the Spokane area. Sixty one stations responded to the WSEO survey.

Spokane reported the third lowest gasoline prices in the study, after Seattle and Vancouver. Transportation costs are a bit higher than the state average. Most gasoline can be delivered at quite low cost to Spokane through the Yellowstone Pipeline from Billings, Montana. However, when the pipeline is at capacity, Spokane must receive gasoline through the Chevron pipeline from Pasco. The marginal cost of transporting gasoline from St. Lake City to Pasco or from California or Anacortes to Portland and then barging it to Pasco is much more expensive than shipment through the Yellowstone directly to Spokane. Spokane has average dealer margins. Sales volumes and vehicle density were reported moderately below average. A majority of stations, 65 percent, offer no discount for cash sales. Spokane has the fourth highest concentration of oil-company-supplied stations in the study, also at 65 percent. Spokane reported wholesale prices just below average.

Only the fact that a large number of stations are oil company supplied works to keep prices low in Spokane. Above average transportation costs, the small number of stations offering cash discounts, below average sales volumes, and vehicle density work to push prices higher. The remaining variables lead to average prices for Spokane. Compared to Seattle, however, most variables push prices higher.

TABLE 11
Gasoline Prices Study - Spokane Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	115	100.0	105	100.0
Sell Regular Leaded	111	96.5	100	95.2
Sell Regular Unleaded	115	100.0	104	99.0
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	100	87.0	89	84.8
Sell Diesel	19	16.5	21	20.0
Station Brands				
Major Refiner Brand	69	60.0	68	64.8
Not Major Refiner Brand	46	40.0	37	35.2
ARCO Brand	0	0.0	0	0.0
BP Brand	0	0.0	0	0.0
Cenex Brand	4	3.5	7	6.7
Chevron Brand	16	13.9	14	13.3
Conoco Brand	21	18.3	20	19.0
Exxon Brand	17	14.8	16	15.2
Shell Brand	0	0.0	0	0.0
Texaco Brand	11	9.6	11	10.5
Unocal Brand	0	0.0	0	0.0
Citgo (including 7-Eleven)	6	5.2	6	5.7
Changed Brand During Study Period			6	5.1
Permanently Closed Operations During Study			14	12.0
Temporarily Closed Operations During Study			8	6.8
Service Type				
Full Service Only	4	3.5	2	1.9
Self Service Only	81	70.4	82	78.1
Split Island	30	26.1	21	20.0
Sell Gasoline Only (No Diesel)	96	83.5	84	80.0
Sell for Cash Only	37	32.2	34	32.4
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	78	67.8	71	67.6

TABLE 11 (Continued)
Gasoline Prices Study - Spokane Metropolitan Data Results
Retail Outlet Data
June 30, 1991

117 Stations in Pricing Database
61 Stations Returned Survey

Market Characteristics

Service Type	Outlets	Percent of Respondents
No Alternative Profit Center	0	0.0
Has Alternative Profit Center	52	100.0
No Response	4	
Convenience Store	27	51.9
No Convenience Store	25	48.1
No Response	4	
Service Bays	20	38.5
No Service Bays	32	61.5
No Response	4	
Lub Bays	11	21.2
No Lub Bays	41	78.8
No Response	4	
Car Wash	8	15.4
No Car Wash	44	84.6
No Response	4	
Truck Stop	3	5.8
No Truck Stop	49	94.2
No Response	4	
Parking Garage	1	1.9
No Parking Garage	51	98.1
No Response	4	
Other	2	3.8
No Other	50	96.2
No Response	4	
Open 24 Hours - 7 Days a Week	16	43.2
Not Open 24 Hours - 7 Days a Week	21	56.8
No Response	19	

TABLE 11 (Continued)
Gasoline Prices Study - Spokane Metropolitan Data Results
Retail Outlet Data — 117 Stations in Pricing Database
June 30, 1991 — 61 Stations Returned Survey

Market Characteristics

	Outlets	Percent of Respondents
Relationship With Supplier		
Supplied by Oil Company	29	60.4
Supplied by Distributor	19	39.6
No Response	8	
Majors Supplied by Oil Company	15	68.2
Majors Supplied by Distributor	7	31.8
Not Applicable	13	
No Response	21	
Have Contracts with Suppliers	32	66.7
Have No Contracts With Suppliers	16	33.3
No Response	8	
Receive Some Discount from Supplier	12	24.0
Receive No Discount from Supplier	38	76.0
No Response	6	
Oil Company Supplied: Receive Discount	4	14.3
Oil Company Supplied: Receive No Discount	24	85.7
Not Applicable	19	
No Response	9	
Distributor Supplied: Receive Discount	7	41.2
Distributor Supplied: Receive No Discount	10	58.8
Not Applicable	29	
No Response	10	
Supplier Operated	5	9.6
Non-Supplier Operated	47	90.4
No Response	4	
Oil Company Operated	4	80.0
Distributor Operated	1	20.0
Not Applicable	47	
No Response	4	

TABLE 11 (Continued)
Gasoline Prices Study - Spokane Metropolitan Data Results
Retail Outlet Data
June 30, 1991

117 Stations in Pricing Database
61 Stations Returned Survey

Market Characteristics

	Outlets	Percent of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	4	14.3
Sell Ethanol	2	
Sell Propane	3	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	24	85.7
No Response		
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	30	57.7
Located further than 1 mile of Major Roadway	22	42.3
No Response	4	
Located within 1 Mile Non-Interstate Highway	10	37.0
Located within 1 Mile of Interstate	17	63.0
Not Applicable	22	
No Response	7	
Customer Classification		
Sell to at least 50% Tourists*	1	5.0
Sell to less than 50% Tourists	19	95.0
No Response	41	
Sell to at least 50% Highway Traffic	1	2.9
Sell to less than 50% Highway Traffic	34	97.1
No Response	21	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	21	6.5	0	25
Number of Employees Part Time	21	2.3	0	6
No Response	7			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Tri-Cities

The Tri-Cities metropolitan area is comprised of four cities-Finley, Kennewick, Pasco, Richland and West Richland-located in Benton and Franklin counties in central southern Washington. The four cities have a combined population of around 85,000. Benton and Franklin counties rank 10th and 22nd in population with 104,100 and 34,200 persons respectively, and population densities of 60.7 and 27.5 persons per square mile, 10th and 20th in the state. The most striking statistic about the Tri-Cities is the rapid migration out of these two counties. Sixteen and four tenths percent of the population in Benton County, and 17.4 percent of the population in Franklin County migrated out during the 1980s. These two counties rank first and second respectively for the most rapid out-migration. The unemployment rate continues to be high -7.7 percent in Benton and 11.8 percent in Franklin. Benton County has dropped from 7th to 12th in per-capita personal income and Franklin County has dropped from 11th to 25th over the last decade. Per capita personal income now stands at $11,896 in Benton County and $11,165 in Franklin County. Total retail sales per capita decreased in Benton and Franklin counties over the decade, 45.4 percent and 12.7 percent respectively.

There are currently 70 gasoline stations in the WSEO Petroleum Pricing Database from the Tri-Cities area. Forty eight stations responded to the WSEO survey.

The Tri-Cities had the third highest average prices in the study. Transportation costs were above the state average, but exactly in the middle of all cities in the study. The Tri-Cities reported the fourth highest dealer margins and the third lowest sales volumes in the study. Along with Aberdeen, the Tri-Cities had the lowest vehicle density in the study, and the third highest percentage of stations offering discounts for cash. Almost 60 percent of stations are supplied by distributors. The Tri-Cities posted the highest average wholesale prices in the study.

Only because many stations offer cash discounts is there downward pressure on prices in the Tri-Cities. The remaining variables, above average transportation costs, fairly high dealer margins, very low sales volumes and vehicle density, the above average number of distributor-supplied stations and high wholesale prices, all work to push prices higher in the area. Only the cash discount works to lower the price against Seattle.

TABLE 12
Gasoline Prices Study - Tri-Cities Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	80	100.0	73	100.0
Sell Regular Leaded	78	97.5	72	98.6
Sell Regular Unleaded	79	98.8	73	100.0
Sell Midgrade Unleaded	3	3.8	2	2.7
Sell Premium Unleaded	70	87.5	65	89.0
Sell Diesel	15	18.8	17	23.3
Station Brands				
Major Refiner Brand	34	42.5	29	39.7
Not Major Refiner Brand	46	57.5	44	60.3
ARCO Brand	0	0.0	0	0.0
BP Brand	0	0.0	0	0.0
Cenex Brand	1	1.3	0	0.0
Chevron Brand	5	6.3	4	5.5
Conoco Brand	7	8.8	8	11.0
Exxon Brand	4	5.0	3	4.1
Shell Brand	7	8.8	7	9.6
Texaco Brand	8	10.0	6	8.2
Unocal Brand	2	2.5	1	1.4
Citgo (including 7-Eleven)	10	12.5	10	13.7
Changed Brand During Study Period			3	3.8
Permanently Closed Operations During Study			4	5.1
Temporarily Closed Operations During Study			4	5.1
Service Type				
Full Service Only	0	0.0	0	0.0
Self Service Only	66	82.5	64	87.7
Split Island	14	17.5	9	12.3
Sell Gasoline Only (No Diesel)	65	81.3	56	76.7
Sell for Cash Only	46	57.5	43	58.9
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	34	42.5	30	41.1

TABLE 12 (Continued)
Gasoline Prices Study - Tri-Cities Metropolitan Data Results
Retail Outlet Data
June 30, 1991

79 Stations in Pricing Database
48 Stations Returned Survey

Market Characteristics

Service Type	Outlets	Percent Of Respondents
No Alternative Profit Center	2	4.5
Has Alternative Profit Center	42	95.5
No Response	4	
Convenience Store	26	59.1
No Convenience Store	18	40.9
No Response	4	
Service Bays	8	18.2
No Service Bays	36	81.8
No Response	4	
Lub Bays	5	11.4
No Lub Bays	39	88.6
No Response	4	
Car Wash	2	4.5
No Car Wash	42	95.5
No Response	4	
Truck Stop	3	6.8
No Truck Stop	41	93.2
No Response	4	
Parking Garage	0	0.0
No Parking Garage	44	100.0
No Response	4	
Other	2	4.5
No Other	42	95.5
No Response	4	
Open 24 Hours - 7 Days a Week	20	48.8
Not Open 24 Hours - 7 Days a Week	21	51.2
No Response	7	

TABLE 12 (Continued)
Gasoline Prices Study - Tri-Cities Metropolitan Data Results
Retail Outlet Data — 79 Stations in Pricing Database
June 30, 1991 — 48 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	19	47.5
Supplied by Distributor	21	52.5
No Response	8	
Majors Supplied by Oil Company	6	40.0
Majors Supplied by Distributor	9	60.0
Not Applicable	25	
No Response	8	
Have Contracts with Suppliers	26	61.9
Have No Contracts With Suppliers	16	38.1
No Response	6	
Receive Some Discount from Supplier	7	14.9
Receive No Discount from Supplier	40	85.1
No Response	1	
Oil Company Supplier: Receive Discount	4	21.1
Oil Company Supplier: Receive No Discount	15	78.9
Not Applicable	21	
No Response	8	
Distributor Supplier: Receive Discount	3	14.3
Distributor Supplier: Receive No Discount	18	85.7
Not Applicable	19	
No Response	8	
Supplier Operated	7	15.2
Non-Supplier Operated	39	84.8
No Response	2	
Oil Company Operated	2	66.7
Distributor Operated	1	33.3
Not Applicable	35	
No Response	10	

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Vancouver

Vancouver is a fairly unique gasoline market, more properly seen as part of the Portland metropolitan area. Vancouver is located across the Columbia River from Portland in Clark County, and has a population of 44,450. Clark County is the fifth largest county in the state, with a population of 220,400 and a population density of 351.5 persons per square mile, third highest in the state. Population increased 14.7 percent during the last decade, 10th fastest in the state, 6.3 percent due to in-migration. Unemployment currently stands at 5.4 percent, 29th in the state. Clark County increased its ranking in per-capita personal income from 18th to 16th during the last ten years; it now stands at $11,559. Total retail sales per-capita increased 10th fastest in the state, at 19.3 percent.

There are currently 31 gasoline stations in the WSEO Petroleum Pricing Database from the Vancouver area. Twenty six stations responded to the WSEO survey.

Vancouver, on the 1-5 corridor, had the second lowest gasoline prices in the study, only behind Seattle. Transportation costs and dealer margins matched the state average. Vancouver shared third place with Bellingham and Spokane for high volumes sold, over 80,000 gallons per month per station. Even without counting the Portland area, Vancouver far and away had the highest vehicle density in the study, with almost 8,000 vehicles per square mile. Not one station offered a discount for cash. This may be due to the fact that Vancouver's low-cost self serve option may already be attracting customers from Portland, where self service is illegal. About 55 percent of Vancouver's stations are supplied by oil companies. Vancouver posted the lowest average wholesale prices by far in the study. We are not sure why this is so, but it may reflect the Portland market, which is a market we have not studied.

Only the fact that no stations offer discounts for cash works to push up prices in Vancouver. Average transportation costs, dealer margins, and sales volumes lead to average prices. All other variables, very high vehicle density, a larger than average percentage of oil-company-supplied stations and the very low wholesale price all work to push prices lower in Vancouver. Vehicle density and wholesale prices work to push prices lower than Seattle. Other variables push prices higher than Seattle.

TABLE 13
Gasoline Prices Study - Vancouver Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	31	100.0	30	100.0
Sell Regular Leaded	31	100.0	30	100.0
Sell Regular Unleaded	31	100.0	30	100.0
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	29	93.5	29	96.7
Sell Diesel	5	16.1	5	16.7
Station Brands				
Major Refiner Brand	21	67.7	21	70.0
Not Major Refiner Brand	10	32.3	9	30.0
ARCO Brand	5	16.1	5	16.7
BP Brand	1	3.2	2	6.7
Cenex Brand	0	0.0	0	0.0
Chevron Brand	6	19.4	6	20.0
Conoco Brand	0	0.0	0	0.0
Exxon Brand	0	0.0	0	0.0
Shell Brand	5	16.1	5	16.7
Texaco Brand	4	12.9	3	10.0
Unocal Brand	0	0.0	0	0.0
Citgo (including 7-Eleven)	1	3.2	1	3.3
Changed Brand During Study Period			6	19.4
Permanently Closed Operations During Study			4	12.9
Temporarily Closed Operations During Study			2	6.5
Service Type				
Full Service Only	0	0.0	0	0.0
Self Service Only	23	74.2	24	80.0
Split Island	8	25.8	6	20.0
Sell Gasoline Only (No Diesel)	26	83.9	25	83.3
Sell for Cash Only	14	45.2	14	46.7
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	17	54.8	16	53.3

TABLE 13 (Continued)
Gasoline Prices Study - Vancouver Metropolitan Data Results
Retail Outlet Data — 31 Stations In Pricing Database
June 30, 1991 — 26 Stations Returned Survey

Market Characteristics

Service Type	Outlets	Percent of Respondents
No Alternative Profit Center	1	5.0
Has Alternative Profit Center	19	95.0
No Response	6	
Convenience Store	10	50.0
No Convenience Store	10	50.0
No Response	6	
Service Bays	5	25.0
No Service Bays	15	75.0
No Response	6	
Lub Bays	5	25.0
No Lub Bays	15	75.0
No Response	6	
Car Wash	2	10.0
No Car Wash	18	90.0
No Response	6	
Truck Stop	0	0.0
No Truck Stop	20	100.0
No Response	6	
Parking Garage	0	0.0
No Parking Garage	20	100.0
No Response	6	
Other	2	10.0
No Other	18	90.0
No Response	6	
Open 24 Hours - 7 Days a Week	3	20.0
Not Open 24 Hours - 7 Days a Week	12	80.0
No Response	11	

TABLE 13 (Continued)
Gasoline Prices Study - Vancouver Metropolitan Data Results
Retail Outlet Data — 31 Stations In Pricing Database
June 30, 1991 — 26 Stations Returned Survey

Market Characteristics

	Outlets	Percent of Respondents
Relationship With Supplier		
Supplied by Oil Company	15	62.5
Supplied by Distributor	9	37.5
No Response	2	
Majors Supplied by Oil Company	12	70.6
Majors Supplied by Distributor	5	29.4
Not Applicable	6	
No Response	3	
Have Contracts with Suppliers	12	80.0
Have No Contracts With Suppliers	3	20.0
No Response	11	
Receive Some Discount from Supplier	6	25.0
Receive No Discount from Supplier	18	75.0
No Response	2	
Receive Discount from Oil Company	5	38.5
Receive No Discount from Oil Company	8	61.5
Not Applicable	9	
No Response	4	
Receive Discount from Distributor	1	11.1
Receive No Discount from Distributor	8	88.9
Not Applicable	15	
No Response	2	
Supplier Operated	3	15.0
Non-Supplier Operated	17	85.0
No Response	6	
Oil Company Operated	2	66.7
Distributor Operated	1	33.3
Not Applicable	17	
No Response	6	

TABLE 13 (Continued)
Gasoline Prices Study - Vancouver Metropolitan Data Results
Retail Outlet Data
June 30, 1991

31 Stations In Pricing Database
26 Stations Returned Survey

Market Characteristics

	Outlets	Percent of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	1	10.0
Sell Ethanol	0	
Sell Propane	1	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	9	90.0
No Response	4	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	14	73.7
Located further than 1 mile of Major Roadway	5	26.3
No Response	7	
Located within 1 Mile Non-Interstate Highway	5	41.7
Located within 1 Mile of Interstate	7	58.3
Not Applicable	5	
No Response	9	
Customer Classification		
Sell to at least 50% Tourists*	0	0.0
Sell to less than 50% Tourists	19	100.0
No Response	14	
Sell to at least 50% Highway Traffic	0	0.0
Sell to less than 50% Highway Traffic	15	100.0
No Response	11	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	20	4.5	2	9
Number of Employees Part Time	20	1.0	0	3
No Response	2			

* Different sample sizes are due to the questions having been asked on a different quarterly survey.

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Wenatchee

Located in Chelan County in the center of the state on the east slope of the Cascades, Wenatchee has a population of 19,950. Chelan is the 19th largest county in the state, with a population of 48,600, and a population density of 16.7 persons per square mile, ranking 25th in the state. Population increased 7.9 percent over the last decade. In-migration represented 6.3 percent of that increase. Only 6.2 percent of the county is farmland. Unemployment currently stands at 10.5 percent, ninth highest in the state. Over the last 10 years Chelan has improved its per-capita personal income ranking from ninth to seventh, where it now stands at $12,594. Total retail sales per-capita increased 12th fastest in the state over the same period, growing at 10.7 percent.

There are currently 23 gasoline stations in the WSEO Petroleum Pricing Database from the Wenatchee area. Fourteen stations responded to the WSEO survey.

Wenatchee posted retail prices above the state average but was exactly in the middle of the 11 cities studied. On a par with Ellensburg, Wenatchee had the third highest transportation costs in the study. Located in the center of the state, gasoline must be transported by truck across the mountains, or by truck from Moses Lake, after a long pipeline trip to and through Spokane. Wenatchee reported the highest dealer margins in our interim report, as high as 18 cents per gallon. By the end of the study period, Wenatchee was reporting the lowest dealer margins, on a par with Clarkston and Seattle. The reason for the difference is not documented; it may be that some element of the Persian Gulf War led to higher margins, or that the opening of a low-priced marketer, ARCO, during that period led to greater competition and a lowering of dealer margins. Wenatchee was exactly in the middle of all cities in sales volumes, but posted the fourth highest vehicle density in the study. Less than 30 percent of dealers offered a discount for cash. Approximately 55 percent of stations in Wenatchee are supplied by oil companies. Wenatchee had the second highest wholesale prices after the Tri-cities.

Wenatchee has numerous variables pushing prices higher as well as lower, leading overall to average retail prices. High transportation costs, a small number of cash discounts and below average sales volumes push prices higher. Low dealer margins, above average vehicle density, and an above average number of oil-company supplied stations push prices lower. Wenatchee has no variables that are pushing prices below Seattle.

TABLE 14
Gasoline Prices Study - Wenatchee Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	23	100.0	22	100.0
Sell Regular Leaded	22	95.7	21	95.5
Sell Regular Unleaded	23	100.0	22	100.0
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	23	100.0	22	100.0
Sell Diesel	5	21.7	6	27.3
Station Brands				
Major Refiner Brand	13	56.5	13	59.1
Not Major Refiner Brand	10	43.5	9	40.9
ARCO Brand	0	0.0	1	4.5
BP Brand	1	4.3	0	0.0
Cenex Brand	0	0.0	0	0.0
Chevron Brand	2	8.7	1	4.5
Conoco Brand	1	4.3	1	4.5
Exxon Brand	4	17.4	4	18.2
Shell Brand	0	0.0	0	0.0
Texaco Brand	5	21.7	6	27.3
Unocal Brand	0	0.0	0	0.0
Citgo (including 7-Eleven)	2	8.7	2	9.1
Changed Brand During Study Period			0	0.0
Permanently Closed Operations During Study			4	17.4
Temporarily Closed Operations During Study			1	4.3
Service Type				
Full Service Only	1	4.3	1	4.5
Self Service Only	19	82.6	16	72.7
Split Island	3	13.0	5	22.7
Sell Gasoline Only (No Diesel)	18	78.3	16	72.7
Sell for Cash Only	12	52.2	10	45.5
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	11	47.8	12	54.5

TABLE 14 (Continued)
Gasoline Prices Study - Wenatchee Metropolitan Data Results
Retail Outlet Data — 23 Stations in Pricing Database
June 30, 1991 — 14 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	0	0.0
Has Alternative Profit Center	14	100.0
No Response	0	
Convenience Store	5	35.7
No Convenience Store	9	64.3
No Response	0	
Service Bays	6	42.9
No Service Bays	8	57.1
No Response	0	
Lub Bays	2	14.3
No Lub Bays	12	85.7
No Response	0	
Car Wash	0	0.0
No Car Wash	14	100.0
No Response	0	
Truck Stop	0	0.0
No Truck Stop	14	100.0
No Response	0	
Parking Garage	0	0.0
No Parking Garage	14	100.0
No Response	0	
Other	0	0.0
No Other	14	100.0
No Response	0	
Open 24 Hours - 7 Days a Week	5	38.5
Not Open 24 Hours - 7 Days a Week	8	61.5
No Response	1	

TABLE 14 (Continued)
Gasoline Prices Study - Wenatchee Metropolitan Data Results
Retail Outlet Data
June 30, 1991

23 Stations in Pricing Database
14 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	4	30.8
Supplied by Distributor	9	69.2
No Response	1	
Majors Supplied by Oil Company	2	22.2
Majors Supplied by Distributor	7	77.8
Not Applicable	4	
No Response	1	
Have Contracts with Suppliers	7	63.6
Have No Contracts With Suppliers	4	36.4
No Response	3	
Receive Some Discount from Supplier	4	30.8
Receive No Discount from Supplier	9	69.2
No Response	1	
Oil Company Supplier: Receive Discount	2	50.0
Oil Company Supplier: Receive No Discount	2	50.0
Not Applicable	9	
No Response	1	
Distributor Supplier: Receive Discount	2	22.2
Distributor Supplier: Receive No Discount	7	77.8
Not Applicable	4	
No Response	1	
Supplier Operated	4	28.6
Non-Supplier Operated	10	71.4
No Response	0	
Oil Company Operated	4	50.0
Distributor Operated	4	50.0
Not Applicable	5	
No Response	1	

TABLE 14 (Continued)
Gasoline Prices Study - Wenatchee Metropolitan Data Results
Retail Outlet Data — 23 Stations in Pricing Database
June 30, 1991 — 14 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	1	10.0
Sell Ethanol	0	
Sell Propane	1	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	9	90.0
No Response	0	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	5	35.7
Located further than 1 mile of Major Roadway	9	64.3
No Response	0	
Located within 1 Mile Non-Interstate Highway	4	100.0
Located within 1 Mile of Interstate	0	0.0
Not Applicable	10	
No Response	0	
Customer Classification		
Sell to at least 50% Tourists*	1	11.1
Sell to less than 50% Tourists	8	88.9
No Response	1	
Sell to at least 50% Highway Traffic	0	0.0
Sell to less than 50% Highway Traffic	13	100.0
No Response	1	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	9	4.0	2	8
Number of Employees Part Time	9	1.6	0	5
No Response	1			

* Smaller sample sizes are due to the questions having been asked on a different quarterly survey.

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Yakima

Yakima is located in Yakima County on the east slope of the Cascades a bit south of Wenatchee. It is the largest city in the county with a population of 50,610. The study includes the cities of Ahtanum, Moxee City, Selah, Union Gap and Yakima. Yakima County is the sixth largest county in the state, with a population of 187,800 and a population density of 43.8 persons per square mile, ranking 13th in the state. Yakima County grew 8.9 percent in the last decade, only .6 percent by in-migration. Farmland accounts for 58.8 percent of the land and 20 percent of the workforce are employed in agriculture and forestry. Unemployment currently ranks sixth highest in the state at 11.9 percent. Per-capita personal income ranking has remained the same eighth lowest in the state over the decade-and it now stands at $10,492. Total retail sales per capita declined by 10.4 percent over the same period.

There are currently 73 gasoline stations in the WSEO Petroleum Pricing Database from the Yakima area. Thirty five stations responded to the WSEO survey.

Yakima posted the fifth highest prices in the study, just above median Wenatchee. Yakima has the second highest transportation costs in the study, behind only Clarkston. Most gasoline must be trucked from Pasco, but some is trucked from Moses Lake and even Seattle. Yakima had dealer margins exactly in the middle of all cities studied. Yakima had the second highest sales volumes in the study, just above 90,000 gallons per month per station. Yakima had the fifth highest vehicle density in the study, just above the median Spokane. More stations, almost 80 percent, offered cash discounts in Yakima than in any other city except Bellingham, also at 80 percent. About 55 percent of stations were supplied by oil companies. Yakima tied with Aberdeen and Bellingham for the third highest wholesale prices in the study.

Large sales volumes, discounts for cash, and an above average number of oil-company supplied stations work to push prices down in Yakima. High transportation costs and high wholesale prices push prices up in Yakima. Average dealer margins and vehicle density lead to average prices in Yakima. Only the large number of cash discounts works to push prices below Seattle.

TABLE 15
Gasoline Prices Study - Yakima Metropolitan Data Results
Retail Outlet Data
June 30, 1991

Market Characteristics	Outlets July 1990	Percent July 1990	Outlets June 1991	Percent June 1991
Product Grades				
Sell Gasoline	69	100.0	64	100.0
Sell Regular Leaded	68	98.6	63	98.4
Sell Regular Unleaded	68	98.6	63	98.4
Sell Midgrade Unleaded	0	0.0	0	0.0
Sell Premium Unleaded	54	78.3	51	79.7
Sell Diesel	22	31.9	22	34.4
Station Brands				
Major Refiner Brand	46	66.7	43	67.2
Not Major Refiner Brand	23	33.3	21	32.8
ARCO Brand	11	15.9	11	17.2
BP Brand	0	0.0	0	0.0
Cenex Brand	1	1.4	1	1.6
Chevron Brand	6	8.7	6	9.4
Conoco Brand	4	5.8	4	6.3
Exxon Brand	5	7.2	5	7.8
Shell Brand	8	11.6	8	12.5
Texaco Brand	11	15.9	8	12.5
Unocal Brand	0	0.0	0	0.0
Citgo (including 7-Eleven)	4	5.8	4	6.3
Changed Brand During Study Period			0	0.0
Permanently Closed Operations During Study			4	5.1
Temporarily Closed Operations During Study			7	8.9
Service Type				
Full Service Only	3	4.3	3	4.7
Self Service Only	55	79.7	52	81.3
Split Island	11	15.9	9	14.1
Sell Gasoline Only (No Diesel)	47	68.1	42	65.6
Sell for Cash Only	35	50.7	33	51.6
Sell for Credit Only	0	0.0	0	0.0
Sell for Cash or Credit	34	49.3	31	48.4

TABLE 15 (Continued)
Gasoline Prices Study - Yakima Metropolitan Data Results
Retail Outlet Data — 73 Stations in Pricing Database
June 30, 1991 — 35 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Service Type		
No Alternative Profit Center	0	0.0
Has Alternative Profit Center	35	100.0
No Response	0	
Convenience Store	27	77.1
No Convenience Store	8	22.9
No Response	0	
Service Bays	7	20.0
No Service Bays	28	80.0
No Response	0	
Lub Bays	6	17.1
No Lub Bays	29	82.9
No Response	0	
Car Wash	5	14.3
No Car Wash	30	85.7
No Response	0	
Truck Stop	2	5.7
No Truck Stop	33	94.3
No Response	0	
Parking Garage	0	0.0
No Parking Garage	35	100.0
No Response	0	
Other	1	2.9
No Other	34	97.1
No Response	0	
Open 24 Hours - 7 Days a Week	9	36.0
Not Open 24 Hours - 7 Days a Week	16	64.0
No Response	10	

TABLE 15 (Continued)
Gasoline Prices Study - Yakima Metropolitan Data Results
Retail Outlet Data — 73 Stations in Pricing Database
June 30, 1991 — 35 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
Relationship With Supplier		
Supplied by Oil Company	17	56.7
Supplied by Distributor	13	43.3
No Response	5	
Majors Supplied by Oil Company	7	38.9
Majors Supplied by Distributor	11	61.1
Not Applicable	12	
No Response	5	
Have Contracts with Suppliers	15	50.0
Have No Contracts With Suppliers	15	50.0
No Response	5	
Receive Some Discount from Supplier	2	6.7
Receive No Discount from Supplier	28	93.3
No Response	5	
Oil Company Supplier: Receive Discount	2	12.5
Oil Company Supplier: Receive No Discount	14	87.5
Not Applicable	13	
No Response	6	
Distributor Supplier: Receive Discount	0	0.0
Distributor Supplier: Receive No Discount	12	100.0
Not Applicable	17	
No Response	6	
Supplier Operated	3	8.8
Non-Supplier Operated	31	91.2
No Response	1	
Oil Company Operated	1	100.0
Distributor Operated	0	0.0
Not Applicable	28	
No Response	6	

TABLE 15 (Continued)
Gasoline Prices Study - Yakima Metropolitan Data Results
Retail Outlet Data — 73 Stations in Pricing Database
June 30, 1991 — 35 Stations Returned Survey

Market Characteristics

	Outlets	Percent Of Respondents
*Alternative Fuels**		
Sell Alternative Fuel	7	36.8
Sell Ethanol	5	
Sell Propane	3	
Sell Methanol	0	
Sell Natural Gas	0	
Sell No Alternative Fuel	12	63.2
No Response	3	
Proximity to Major Roadway		
Located within 1 Mile of Major Roadway	18	51.4
Located further than 1 mile of Major Roadway	17	48.6
No Response	0	
Located within 1 Mile Non-Interstate Highway	5	31.3
Located within 1 Mile of Interstate	11	68.8
Not Applicable	19	
No Response	0	
Customer Classification		
Sell to at least 50% Tourists*	1	8.3
Sell to less than 50% Tourists	11	91.7
No Response	9	
Sell to at least 50% Highway Traffic	3	12.0
Sell to less than 50% Highway Traffic	22	88.0
No Response	10	

	Outlets Reporting	Average	Minimum	Maximum
Number of Employees Full Time*	13	4.1	1	8
Number of Employees Part Time	13	2.5	0	7
No Response	9			

* Sample sizes vary due to the questions having been asked on a different quarterly survey.

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