The Truck Comes First

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The creation of the Interstate Highway System in Arizona, coupled with advances in the field of automotive engineering relating to trucks and the demands of the consumer necessitating rapid, economical, and efficient transportation of products, has had a decided effect on type of services and service facilities that must be provided to satisfy the desires and demands of the drivers of interstate and intrastate trucks.

The Southern Route through Arizona—I-10 from San Simon through Tucson to Casa Grande, then I-8 to Yuma—carries more truck traffic than any other east-west or north-south route in the state. This route also has more service facilities catering to the trucker than any of the other routes.

This basic information, combined with an interest and a curiosity in the rapidly expanding truck services in Arizona, the determination of directional truck volumes, and fuel volumes, was considered of utmost importance.

This concept of the economics of the services provided to the trucking industry could be valuable in highway design, traffic control, appraising and land acquisition, and in the preparation of eminent domain cases. The Condemnation Division of the Right of Way Section was directed to undertake the gathering and formulation of all available data and from this to determine if reasonably accurate conclusions could benefit the aforementioned interests within the highway department.

Travel on the Interstate Highway System, together with travel on the state primary and secondary systems, has caused a demand by the consumer, not only in Arizona but also in the majority of the fifty states, for better and more complete service facilities. In the passenger-car field, major oil companies have teamed with major motel chains to provide a complete one-stop service.

Because of the nature of the trucking industry, all necessary services should logically be provided at one place, under one operation. Data and information gathered for this study support this premise and indicate that businessmen in Arizona are lagging behind the other states in the type and quality of services that must be provided to our trucking industry.

SPECIFIC STUDY AREA

The Condemnation Division formulated a study to determine the extraneous factors involved in a loss of business of certain truck stops in the Jaynes Station area near Tucson. Owners of these truck stops claimed their businesses suffered a loss in value due to the limitation of access caused by the construction of I-10 immediately in front of their businesses.

It was the feeling of the Condemnation Division that any losses suffered by these businesses were not due to a reduction in the market value of their properties but, where any losses had occurred, they were mainly due to an increase in new and modern competition.

An extensive four-month study was undertaken with the cooperation of the Motor Vehicle Division to determine the habits of truck drivers. Further information was sponsored by Committee on Land Acquisition and Committee on Socio-Economic Aspects of Highways and presented at the 47th Annual Meeting.
gathered from the owners of the larger truck lines and from various truck stop owners throughout the country, but with particular emphasis on those with stations in the Tucson area.

TRUCK STOPS AND THE TRUCKING INDUSTRY

There are three truck stops in the immediate Jaynes Station area near Tucson that appear to be the mainstay of the business enterprises. Further observation revealed that, since these were the major businesses in the area, the other businesses all were related in some fashion to these truck stops.

Looking around the state, the Condensation Division discovered that truck stops are unique. There is no way that they can be compared with a service station orientated to automobile drivers. These truck stops were designed to serve the peculiar needs and wants of professional truck drivers. A truck is considered by the average motorist to be a monster with gas tanks so large as to enable it to traverse several states without stopping for fuel. It is true that most large trucks have fuel tanks that hold a minimum of 150 gallons and as much as 300 gallons.

Discussions with several dealers who sell large trucks revealed that fuel tanks vary for each truck and there is no standard size for tanks. These dealers report any order which they send to the factory without specifications for size and type of fuel tanks will be returned until that information is supplied. Dealers feel that if all capacities of these tanks were taken collectively, the average would be more than 150 gallons. This appears to be a rather large figure since most cars have about a 20-gallon capacity. We must further visualize the tonnage trucks pull, and just observing trucks up and down highways we can realize that loads are very large. These large loads increase fuel consumption to a diminutive average of 4.5 miles per gallon. This gives the average truck a range of only 675 miles. This range seems rather large compared to automobiles, as it is about two times the range to which the average highway traveler is accustomed; but the fuel capacity of a truck is about 7.5 times the capacity of the auto.

The 675-mile range of the average truck is large enough to enable it to traverse several states without fueling. Realizing there are numerous reasons for the large amount of diesel fuel purchased on the Southern Route, it is sufficient to observe for this report that the truck stops along this route are a very good business venture.

Most states realize the potential usage of their highways by vehicles propelled by diesel fuel and liquid petroleum, rather than gasoline, and have enacted laws that enable them to impose an excise tax on these users as a means of partially compensating states for construction and maintenance of their highway facilities. The use fuel tax imposed by Arizona on vehicles using diesel fuel is based on the proportionate share of their total monthly gallons per mile that is used in their mileage within the state.

Neither this method of taxing nor the amount of tax imposed on the same fuels in adjacent states would seem to justify an advantage in the truck stop business within the state.

Truck drivers, being only human, must stop to eat and use restroom facilities just as any other motorist traveling the highways. These facilities are usually incorporated with a truck stop. They may not be on the same property but they are in very close proximity and with good reason. In today's growing real estate market, the price of land has skyrocketed. The average cafe only needs to have sufficient land to accommodate automobiles. A cafe catering to truckers needs much more land for parking trucks and much excess land to enable large rigs to maneuver. To incorporate a truck stop with cafes, restroom facilities, and other needs or wants of truckers is purely an economic move so that all facilities use one parking area and related maneuvering room rather than have separate ones for each.

FACILITIES IN STUDY AREA

The first step was to investigate the various truck stops under study. A detailed inspection was made of each, and the facilities compared. A comparison of the facilities available at each truck stop in the Tucson area is given in Table 1.
The Tucson Truck Terminal, commonly known as the "Triple T," is the newest and largest in the Tucson area. On May 10, 1966, it opened in the present new location at the intersection of Craycroft Road and I-10 on a one-way, westbound frontage road. It is advertised by Enco as the "World's Largest Enco Station." Diesel fuel sells for 25.9 cents per gallon with regular selling for 35.9 cents, whereas at major service stations within the city regular sells for 11 cents less. Stalls in the paved parking area are sufficient for 50 to 60 trucks with excess maneuvering room remaining (Fig. 1).

The Texaco Truck Terminal, the second largest in the area, is owned by the Kelber Brothers who own another extremely large truck stop in Fresno, California. The Tucson operation opened for business in September 1963 at the intersection of Wilmot Road and I-10. Like the "Triple T," it is on a one-way, westbound frontage road. Fuel prices are lower than at the "Triple T," but high for the general area. Parking stalls in the paved area are available for 35 to 40 trucks, with adequate maneuvering space remaining. A cattle rest facility located one-half mile to the east on a two-way frontage road may have an effect on the volume of business (Fig. 1).

The Art Hague Truck Stop is the oldest in Jaynes Station, having been built in 1956. The facilities available are as complete as any in the area but lack much that is contained in a modern stop. Table 1 shows a cafe included; however, it is on adjoining property that is owned by the lessee of the truck stop. The two combined properties create increased parking area, much of which is unpaved, but it is restricted as compared to today's standards. Price is the lowest in the Tucson area at 18.9 cents for the lowest grade diesel fuel. Its location is on a two-way frontage road about midway between two diamond interchanges on I-10 (Fig. 2).

The 84 Truck Stop is the oldest in Tucson; however, the present facilities are relatively new, having been built in 1957. The original truck stop was in front of the present location and was purchased for additional right of way of I-10. A diesel motor repair in a separate building on the property and a nationally recognized refrigeration expert in the main building undoubtedly attract additional clientele. The property is on a one-way, northbound frontage road; however, it is considerably south

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**TABLE 1**

<table>
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<tr>
<th>Truck Stop</th>
<th>Parking Capacity</th>
<th>Cafe</th>
<th>Showers</th>
<th>Lounge</th>
<th>Laundry</th>
<th>Rest Shop</th>
<th>Clothing Sales</th>
<th>Snacks</th>
<th>Ice</th>
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*Figure 1. Truck stops.*
Figure 2. Truck stops.
of the Prince Road Interchange on I-10. Access for eastbound trucks involves more than a mile of difficult maneuvering but is apparently not a factor to consider since the station receives a larger percentage of eastbound traffic than westbound (Fig. 2).

The American Oil Truck Stop in Jaynes Station has only been open under the present management since December 1965. It was vacant for the prior six months as the former lessee moved out in May. The present lessee claims a large volume will never be possible because of the very limited parking area. The restricted size of the land area also prohibits the inclusion of additional related facilities. The location is a few hundred yards south of the Hague facility on the same side of the road (Fig. 2).

Ken's Union 76 Truck Stop is across I-10 from the Hague Truck Stop and is also on a two-way frontage road. Although built in 1963, it does not have the quality nor quantity of facilities indicated by the recent trends in truck stop construction. Developed and undeveloped land area are sufficient for the operation today and for the foreseeable future. The present manager is not the type of individual the industry would consider a truck stop operator, because the professional operator is considered a special breed. This is probably a big factor in the amount of business (Fig. 2).

Possum Brown's Truck Stop is the former location of the "Triple T." The facilities are small and old with unpaved parking areas. It is located opposite the westbound lane of a divided primary highway. Crossovers in the median are located at the extremities of the property. Price of diesel, 25.9 cents, may be a factor limiting business here as this is as high as the "Triple T"; also, the lack of Western Union could be a further business prohibition.

The Grainger American Station has only been open as such since September 1965. The facilities are very limited, as is parking. A cafe is located on the property to the east and a motel on the property to the west, but these do not enhance the overall facility. Price of diesel fuel is also 25.9 cents which seems unrealistic compared to the services available. The access is to a conventional four-lane, undivided highway.

The Freeway Truck Stop is located across I-10 from the 84 Truck Stop on a one-way, southbound frontage road. The last operator was unable to continue in business and closed his operation on June 6, 1966. Gallonage figures were unobtainable from Humble Oil Company so this station was disregarded except to see the effect of its closing on the volume of the other truck stops.

**SUMMARY OF FACILITIES**

Through careful examination of the facilities at the more recently constructed truck stops we can see that every possible convenience is being offered to attract the professional truck driver. The Pure Oil Company and the Skelly Oil Company, generally recognized as the leaders in the truck stop industry, have embarked on vast building programs and are presently constructing complexes throughout the Midwest. The facilities being built follow the same trend as the Triple T and the Texaco Terminal Stations in Tucson.

After viewing a newer truck stop, one can visualize the huge investment required to set up and operate this type of business. No average cost can be established for a typical truck stop as each is different and of course land values and building costs will vary. However, it can be said that, at the present time, a cost of $1.6 million would be the upper limit as that is the construction cost of the most costly one built in the United States according to nationwide figures. A lower limit would be extremely hard to establish because of what may or may not be offered in the way of related facilities. In general, throughout the nation the trend is to a homogenous complex to serve each and every need of a professional driver.

While the professional driver is the one to be served, an eye is kept on the average traveling motorist and a service station for automobiles is frequently included in the complex. After all, why should a large segment of the highway traveler be overlooked? Studies indicate that the service station included in the truck stop complex will do a business that exceeds most highway stations operating as a single unit. Another important fact is that these stations usually charge more for a gallon of gasoline than do stations in town. They are further unaffected by gas wars that crop up from time to time, especially in the Tucson area.
The development of truck stops into a highly sophisticated industry is easily discernible. In the last ten years the trucker has realized his position on today's social ladder. In the past the trucker has been on the lower end, but in recent years he has realized his rightful position. The trend has been for the driver to own the truck and lease it to various businesses, pulling their trailers. The investment required by a driver ranges from about $25,000 to $40,000, depending on the truck and extra equipment. A person owning one or more trucks has a sizeable business to operate. As 98 percent of the trucks operating on highways today are owned in this manner, catering to the desires of these owner-operators has become an even bigger business.

The emergence of the new type of driver has made certain changes necessary in the makeup of the truck stop complex. Yesteryear's owners of each separate business at a truck stop allowed no control over the entire setup. These various businesses are now being integrated under one ownership as can be seen in the newer facilities. The various auxiliary facilities are being built by individuals and then leased out to others while control of the entire complex remains under one ownership. Usually one ownership controls the truck stop directly but does not directly participate in operation of the other units. He, too, is more of a businessman than in past years and recognizes the need for separate management of diversified business.

The auxiliary facilities have changed as much as the truck stops themselves. Cafes have changed from the "greasy spoon" type to one every bit as clean and modern as found in the heart of a city. It is no longer just a place to get a bowl of chili and a hamburger but is now a complete, first-class restaurant. The bunkhouses closely resemble a small motel rather than a large room with several cheap cots. Cleanliness seems to be one of the main themes influencing the operation of all units. This is in keeping with the trend of the drivers themselves to keep a cleaner atmosphere around the trucking industry.

The driver has changed from a rough and rugged, greasy-handed driver to a businessman-driver. In past years he was not concerned about his fuel and the price paid for it. It was not his money he was spending, which led to ticket padding through which he made extra money to supplement meager earnings. Today it is his own money. He must watch costs closely. This has led to inclusion of scales at newer truck stops enabling him to weigh his load so he may evade the taxes or fines for overweight vehicles. This has further led to rather erratic fueling habits.

4-DAY DRIVER INTERVIEW

The Condemnation Division obtained the cooperation of the Motor Vehicle Division in a four-day interview of truck drivers at the San Simon and Yuma Inspection Stations. The inspectors at these stations commenced this interview at 12:00 noon on August 26, 1966, and concluded at 12:00 noon on August 30, 1966. The information requested from each driver was: (1) do you fuel in Arizona, (2) in what towns, and (3) at what truck stops. The answers were submitted for tabulation.

Investigation of the "Truck & Bus Sheets" of the Motor Vehicle Division enabled us to determine which of these trucks used the Southern Route through Arizona. We then knew the total vehicles passing through both Yuma and San Simon going either direction, the total vehicles either westbound or eastbound at each location, and the total coming into the state that would take the Southern Route from each location.

Whatever period of time was selected for this study, there would be some traffic missed. Those doing the actual questioning at the inspection stations assured us this period of time would be as representative as possible.

During the study time, a total of 2,575 commercial vehicles passed through the San Simon inspection station. Of these, 1,747 were westbound or 68 percent of the total. We found that of those westbound, 1,083 vehicles or 62 percent of the westbound traffic took the Southern Route. The Southern Route traffic westbound represents 42 percent of the total vehicles going through the San Simon station in either direction.

During the same period of time, a total of 2,300 commercial vehicles passed through the Yuma inspection station. Of this number, 1,375 or 60 percent were eastbound out of Yuma. Of the eastbound vehicles, 1,104 indicated they were going to use the Southern Route or 80 percent of the total eastbound traffic. Southern Route traffic going
eastbound represents 48 percent of all commercial vehicles passing through the Yuma Station bound in either direction.

It is rather difficult to draw a comparison of the two stations. Since the Southern Route involves the length of the entire state, a greater percentage of those going westbound from San Simon will go north from Tucson to Phoenix or south from Tucson to Nogales than will go straight through to Yuma. It can be reasoned that there are two main routes to get to Phoenix from the eastern part of the country—on US 66 or by way of the so-called Southern Route. A detailed study of "Truck and Bus Sheets" revealed that the origin and destination of trucks indicated the Southern Route would be the most logical choice. The same is not true at Yuma. Most of the trucks coming into Yuma eastbound originate their trip in California, so a more direct route to Phoenix may be used and is preferred to the Southern Route. Therefore, because 80 percent of all eastbound trucks use the Southern Route out of Yuma, and only 62 percent of all westbound trucks use this route out of San Simon, the traffic patterns out of the two stations cannot be compared favorably.

It was determined that with a reasonable amount of accuracy the figures taken from each station considered separately could be projected to yearly figures. By doing this, we could forecast the number of eastbound and westbound trucks going through Yuma. It must be kept in mind that the total number of vehicles passing through these points could be obtained by actual count for any given month or year. For a desired higher degree of accuracy, these figures should only be projected on a yearly basis. This would eliminate any bias caused by in-season farm products that would tend to affect monthly figures, especially in this area.

We may further forecast or project these figures into the number of trucks traveling the Southern Route. The same methods would be applied as above. In this case the degree of accuracy will decrease and any error involved in the above projection will be compounded or enlarged in these projections.

Truckers entering at San Simon indicated 53 percent were going to fuel in Tucson and 29 percent were going to fuel in Yuma. Other locations totaled about 10 percent. The reason for the high count in Tucson was that it is the first major area a trucker encountered in southern Arizona going westbound from San Simon. The survey also indicated that 93 percent of all trucks traveling the Southern Route stop in Tucson but only about half of these buy fuel. The other half must therefore stop for some other reason, such as rest or food. These other desires will generate an income for some related business such as restaurants, bunkhouses, and the like. A truck stop, catering to all drivers, should therefore have all these facilities available to be considered in the main competition of today's market.

It is rather significant to note that almost 29 percent of the westbound trucks fuel in Yuma just prior to leaving the state. This fact is hard to explain because a truck with full tanks can usually make it to Los Angeles or other destinations in California.

Of the trucks entering the state at Yuma, 59 percent fuel in Yuma and 37 percent fuel in Tucson. These figures are somewhat misleading as a number of trucks fuel in both cities. A count of these could not be obtained because of the manner in which the questions were formulated. It is rather interesting to note a certain amount of trucks do fuel in both locations because of the close proximity of the two cities. In comparing gallonage figures in the cities, trucks apparently did not fill their tanks in Yuma but rather just added a lesser amount and completed their fueling in Tucson. A certain amount of this can possibly be explained by the fact that the facilities available at the Tucson Truck Terminal and the Texaco Terminal Station far exceed any in Yuma. It is thought that these other related, superior facilities will tend to draw more fuel customers as well as business to the auxiliary facilities.

When studying the places where trucks stop for fuel without regard to where they entered the state, Yuma and Tucson capture a fairly equal share of the market. This is not borne out by the gallonage figures, however. Again we must look to related studies for the answer. We find that the trucks entering the state at San Simon travel the Southern Route to a lesser degree than do trucks entering at Yuma. As explained earlier in this study, these trucks may travel north from Tucson to Phoenix or south to Nogales and Mexico. It can be reasoned that a certain unknown percentage of these
will fuel in Tucson and therefore boost gallonage figures in the Tucson market so they appear to be far greater than those obtained in Yuma.

When the study revealed the locations where trucks stopped, a more enlightening figure turned up. In the Tucson area, the Tucson Truck Terminal serves 54 percent of the trucks entering at San Simon as compared to 52 percent of those entering at Yuma. The Texaco Terminal Station gets 16 percent of the business entering at San Simon and 17 percent of those entering at Yuma.

All of the truck stops in Tucson follow the same pattern of service to an equal percentage of trucks entering at San Simon and at Yuma. This trend would contradict the theory that service stations should be located on the incoming side of a town. It further shows that any attempt to compare the habits of truckers with the habits of automobile travelers is impossible.

The study figures indicate the stops in Yuma generally follow the same pattern as Tucson. Again it makes little difference which way a truck enters the city. The main difference appears to be the share of business the mavericks or wildcatters get from each direction. The study shows that they get 15 percent of the business when the truck enters at San Simon but only 2 percent when the truck enters at Yuma. Overall, wildcatters or mavericks account for only 7 percent of the diesel fuel business in Yuma. This figure, although higher than Tucson, is still rather low when you realize that we only include four Yuma truck stops in our study as compared to seven in Tucson.

MAJOR CARRIER SURVEY

The four-day interview did not include the major carriers, so a separate inquiry had to be made to determine their habits. We attempted to see if the habits of major firms differed from those of independent drivers.

A questionnaire was sent to all truck lines which averaged more than 30 trucks per month along the Southern Route of Arizona during July 1966. In all, 116 firms were sent the questionnaire and 66 were returned. A return rate of 57 percent was the final result. It should be noted that several responded, but could not answer because they owned their own fueling facilities, which is one of the factors we sought to discover in the questionnaire.

In answer to the first question, the respondents stated they stopped on an average of once every 231.66 miles. In terms of hours it averaged 4.2 hours. Not all of these stops were for fuel, and the average mileage between fueling points could not be determined. Stops made for any reason will generate some income for the auxiliary facilities at the truck stops having other facilities.

In response to question No. 2, most firms indicated stops in Tucson and Yuma. Of those responding, 92 percent indicated a stop in Tucson and 89 percent indicated a stop in Yuma. Rather surprising was the fact that 40 percent indicated a stop in San Simon. Phoenix was mentioned on 30 percent even though it was not included on the Southern Route; however, the percentage stopping shows it is large enough so it should be noted. There were stops at other points on the route, but the percentages were rather small.

In analyzing the results of these questions, it is apparent that the stopping points do not follow in direct proportion to gallonage. This indicated other facilities were sought. A few respondents indicated they stop where there is good food and plenty of parking, so these features should be included in a major truck stop if it is to compete in today's market. Inclusion of these auxiliary facilities will undoubtedly attract customers who might purchase fuel.

The respondents to question No. 3 gave answers that more closely follow the gallonage figures given by the various stations. They also gave answers that are in keeping with the four-day interview made in connection with this report. About 25 percent of those stopping in Tucson said they stop at either the Tucson Truck Terminal or the Texaco Terminal Station. Since the Jaynes Station area is of particular interest, it should be noted that only eight firms said they stopped in that area. Five went to Art Hague's and three used Ken's Union 76. This gave the Jaynes Station area about 14 percent of the responses.

Question No. 4 showed that only about 10 percent of these firms have contracts to fuel at a specified place. One of the contracts was verbal and one was only an authorized
stop. Where these 10 percent have their contracts is not known, and an attempt to find out from the truck-stop operators shed no light on the problem.

Question No. 5 sought to determine the length of time any contracts may be enforced. No answers were given to this question and the reason is unknown.

Question No. 6 asked if these firms had changed truck stops from the ones they patronized prior to 1964. The responses indicated 23 percent had changed.

Question No. 7 went on to ask why the change took place and a variety of answers was given. Of the 14, six listed convenience or service. Other answers included credit reasons and more convenience in terms of mileage and price. One respondent said he changed due to fuel ticket padding. Since truck drivers are very clannish, news of this sort can easily spread through the industry and an economic boycott can be enforced although not organized.

THE ECONOMIC ANALYSIS

Now that we have completed a look at the services provided by the various truck stops under investigation and the desires of the drivers to be served, let us see if industry sales bear out the ideas and trends indicated in the foregoing analysis. We shall look at sales in a different manner. It is an attempt to analyze the product preference as suggested previously.

Product preference is the expression of the total impact on the consumer of product characteristics, price, advertising and promotion, and the distribution methods and channels employed. The level of preference for a particular product will fluctuate with the effort expended in these various directions, not only in behalf of a particular product but also in behalf of competitive products. The disappearance from the market of products that once enjoyed acceptance, or even a high degree of preference, offers evidence of inconstancy in consumer preference.

Measuring product preference is not simple. Although it would appear reasonable to use sales volume as a criterion of product preference, this measurement has several drawbacks, as follows:

1. Sales are affected by economic factors, and product preference may remain constant or actually be waning while sales volume is increasing because of expanding economy, shortages, etc.
2. The sales volume of an individual company is most meaningful when it can be related to the total market and to the sales volume of competitors. The movement of the share of market being realized by a company may reflect the level of product preference that it has achieved, if proper consideration is given to circumstances which may be having an abnormal effect on the sales of competitors' products.
3. Sales volume as a criterion of product preference is often too insensitive a barometer to serve as an exclusive measure. Once product preference has declined to a level at which sales volume is seriously affected, it may be difficult to regain consumers' favor. It would be much more desirable to be informed about the level of preference for your product before demand shifted into a competitors' product.

Company sales figures are not sufficient for measuring progress or competitive effectiveness. Even current sales to consumers are not an indicator of trends that are in the making. Even more important, unless sales are compared with competitors' sales or against total industry sales, the company has no way of knowing whether it is doing as well as it could do or ought to do in terms of the share of the market it is securing and the potential that is still there to be won.

For the purposes of this study, we shall look at product preference in the terms of a share of market analysis. We shall not attempt in any way to determine the factors in the marketing mix that lead to product preference but only at product preference itself. Again for the purposes of this study the term product shall be construed to mean all goods and services offered at a singular truck stop. We know that brand of fuel, service, auxiliary facilities, location, and many other factors intermingle to provide a certain desire for a trucker to stop at a particular truck stop. The truck stop shall have considered as its product the combination of everything it has to offer the consumer.
Our analysis, while not highly complex, had to be done in several ways to get the true overall picture. We found that we have an overall possible competitive area throughout southern Arizona, one within the Tucson area and one within the Yuma area. If 100 percent accuracy were desired, we would have had to analyze the sales of every truck stop in the nation because of the carrying capacity of the fuel tanks on large trucks. Our level of accuracy was of course reduced somewhat but not to any level where we were purely guessing. It is impossible to give the degree of accuracy obtained with the figures given in this phase of the report; but we assumed that they were within 5 percent of the comparable figures that would have been obtained on a nationwide basis. This was made possible because of the broad area covered and the different analysis made within.

The value of this type of study can be easily seen by comparing the gallonage figures of a leading truck stop in either Tucson or Yuma with the share of market figure for the same location. It is easy to see how an operator can be lulled into a false sense of security by only watching his own gallonage figures.

THE TUCSON MARKET

Tucson being the largest area of concentration for truck stops and the area with greatest sales, we shall discuss it first. We were able to obtain gallonage figures for all truck stops discussed within the report in the Tucson area and are therefore able to figure total industry sales within the Tucson area. Here we must assume the figures given to us were the actual figures.

Because of the different times for which gallonage figures were given, we shall restrict our analysis to the period from January 1, 1962, through June 30, 1966. During this period, conditions were continually changing in the Tucson area and these can be ruled one of the determining factors in the major changes of the various "share of market" figures contained within the report.

During 1962, the first year we shall analyze, we find only four truck stops open. The Triple T, Art Hague, and American Oil enjoyed unlimited access to four-lane highways during this period, while the 84 Truck Stop was on a one-way frontage road adjacent to an Interstate highway. It is interesting to note that although the "84" captures the smallest share of the market, its share is not that much less than the American Oil station. We therefore believe it is safe to conclude that limitation of access can be overcome with superiority in other areas of the marketing mix.

Conditions began to change in 1963. In September, the Texaco Truck Stop opened at an interchange location on I-10. At about the same time, the access was being hampered at Art Hague's and American Oil. Because these changes happened late in the year, they have little effect on yearly figures when compared to 1962; however, comparison by any other manner will not be fair and figures might vary widely.

A glance at figures for the Texaco Truck Stop, when compared with others, shows who is losing the business they gain. It is also interesting to notice that figures for the Triple T remain substantially the same. At the time, it was the only major truck stop with unlimited access. If access were the primary consideration, the Triple T's share of the market should have increased to upwards of 90 percent.

Again, in 1964, we find yet another truck stop opening so conditions do not lend themselves to analysis in the best possible manner. In September, Ken's Cut Rate opened with several fueling contracts with major truck lines and cattle pens for resting livestock in accordance with ICC regulations. The yearly share of market figures for this location are not spectacular; however, the monthly figures are higher than when the new Texaco station opened.

Yearly figures show some very interesting ideas when compared to figures of 1963. The Texaco Truck Stop, in its first complete year of operation, has hurt all others in the Tucson area in a somewhat similar manner. The 15 percent share of the market that Texaco now enjoys seems to come in more or less equal amounts of somewhat less than 4 percent from each of the others.

One interesting thing must be noticed in a glance over monthly figures and that is the low figure for American Oil in March. When looking at the figures for American
Oil, we see them steadily increasing from March to the end of the year, yet they still show a yearly loss because of one low month. Actually if March and April are not considered, American Oil has not suffered because of the new Texaco operation.

We must keep in mind that, all during 1964, construction of the new Interstate highway was taking place in front of Art Hague's, American Oil, and Ken's. We cannot determine the effect of the construction on Ken's business. American Oil has been analyzed above and it appears that the construction did not have a drastic effect on its business except perhaps during March and April. This is impossible to determine accurately due to the lack of relevant data being recorded by highway construction officials. We can see that Art Hague's business has suffered but no determination can be made as to what part, if any, is due to construction and what part, if any, is due to the increased competition. Although it is impossible to determine the cause, it is fairly reasonable to say that a large percentage of the loss is due to increased competition, because the American Oil station would have been affected by the construction in a like manner. Competition would not have the same effect on both places, because any change in the marketing mix would have an effect on the share of market of each. Based on the monthly figures, the American Oil station was apparently successful in counteracting the increased competition, while Art Hague was not.

The year 1965 finds yet another type of change taking place in that the American Oil station was closed from June through November. This closure will necessarily mean that their business moved elsewhere, but it is impossible to say where it went. Analysis of the share of market captured by the other truck stops in Jaynes Station does not reflect an increase anywhere near the share formerly done by American Oil, so, if their business stayed in Jaynes Station, an equal loss was suffered by the stations in this area to other locations.

Again in 1965, we find an increase in the share of market being captured by the new Texaco location as it continues to grow with its superior facilities. At this point Texaco was second only to the Triple T, which obviously suffered because of the increased competition. A look behind the scenes finds the Triple T planning a new ultra-modern facility to open in 1966 in order to cope with increasing competition. Art Hague apparently is unable to get a new location because of the terms of his present lease and he is hampered somewhat by space and the inability to add improved facilities. Ken's had steadily increased throughout the year despite construction in the area and the competition provided by Texaco.

The determining factor leading to the closing of the American Oil Station was virtually impossible to discover. Sales seemed to fall off at a time when highway construction started in the area and about the same time the Texaco facility opened. The operator stated that he was used to making more money in another business than he ever had in this type of business. This would indicate that, for him, the entire operation was marginal even before sales slumped.

In 1966 we only have complete figures for the first six months, so only the first year can be put to analysis. For this period of time, all six truck stops in the area were opened with few, if any, changes and all construction had been completed. An analysis of this period is of little value because changes are so slight as to have been caused by ordinary day-to-day businesses and we are interested in extraneous factors.

An overall analysis from 1962 to present shows some most interesting facts. From 1962, with four truck stops in existence, an ever-broadening market has increased this number to six with one changing to a new, modern facility in addition to the two new facilities. The two new ones have moved in to garner one-third of the market for diesel fuel, which shows a lack of some type on the part of the existing truck stop operations.

One thing that does not shine through any figures is the effect of management. Since "Ken's 76" was opened in September 1964, four managers have operated the station. A separate analysis was made of the effect of these changes. Gallonage figures were plotted on chart paper and the periods of management shown. Even a quick glance at such a chart shows the drastic effect a poor manager can have on an operation. In most cases, a personal problem required the change in management. The only other management change in the Tucson area during the period under analysis was at the American Oil station in Jaynes Station. After one manager gave up, this operation was
closed for several months before new management took over and, because of this lag in the change, a chart analysis cannot be made fairly.

A comparison of the percent of gallonage market being enjoyed by the six most effective facilities in the Tucson area is shown in Figure 3.

THE YUMA MARKET

The Yuma market was not scrutinized as closely as the Tucson market. The constantly changing conditions which exist in the Tucson area are not present in Yuma. All facilities are similar and all are located on the same highway with similar unrestricted access. About the only change in Yuma has been the opening of the Nichols' Jet station in February 1961. Although Nichols' Jet is new to Yuma itself, it was formerly located in California just a short distance from Yuma. Undoubtedly, a large share of his business has followed him in his move; however, no determination can be made as to what percentage of business formerly patronized him in California and what percentage is new business which may have been taken from other Yuma operators.

The introduction of Nichols' Jet in February 1961 seemed to have no immediate effect on the actual gallonage pumped by the others, although in terms of share of the market the effect has been both immediate and drastic. Over the entire period under study, it is obvious that the presence of Nichols' Jet has had a marked effect on business, especially that of the Yuma Truck Stop and Ted's Truck Center. Prior to the opening of Nichols' Jet, these two were doing 90 to 95 percent of the business in the Yuma area and it would have been most reasonable on their part to expect competition to come in and at least attempt to take some of the market away. Apparently this was not done or everyone marked time until such time as the new freeway was established in the Yuma area. It is interesting to note that both Nichols' Jet and Ted's Truck Center have purchased land in the immediate vicinity of the proposed freeway. It is known that
Ted's has plans for a new facility similar to the Triple T in Tucson. Nichols' new site will be hampered by lack of size as the highway right-of-way has substantially reduced the 10 acres he bought. It is not necessary to analyze the share of market figures on a month-to-month or even a year-by-year basis as the changes that existed in Tucson are not present in Yuma (Fig. 4).

THE SOUTHERN ARIZONA MARKET

This study is included as a part of the report merely for information rather than for an analysis of any type. It would not be fair to compare the locations in Tucson with those in Yuma, because those in Tucson were experiencing problems, such as highway construction, that cannot be controlled by the operator. No attempt was made to see what effect construction might have and therefore it is not even possible to adjust figures to attempt to minimize the effect of this construction.

Changes which take place are not as drastic as those in which only Tucson or Yuma was included. When a more encompassing study such as this is done, the frame of reference must be changed so that changes of 2 percent or more should seem as important as a 6 to 7 percent change in a smaller study. Based on answers given to our questionnaires, Tucson and Yuma are both stops for a majority of the drivers so that separate analyses of both the Tucson and Yuma markets hold more meaningful information and should therefore be subject to more scrutiny than this study of the southern Arizona market.