

## CASE STUDY

### TRANSPORTATION COMPANY

Location:	Texas
Established:	1973
Ownership:	Private
Date of Analysis:	April 2003
Volume:	\$57 million
Net Operating Profit:	(3.43%)
Number of Rigs	137
Number of Tank Trailers;	305
Number of locations:	14
Number of Employees:	732
Prime Area of Business:	Contract hauling of retail fuels, (Diesel, Gasoline) for Chevron, Seven Eleven, Love's and four other major retailers in Texas and Oklahoma, from Terminals to stores, daily. Asphalt products haulage to industry. Hauling of solvent products to various industries.
Headquarters:	Fort Worth, Houston, San Antonio.

### PRE-ANALYSIS PROBLEMS STATED BY THE OWNER WITH WEIGHTING FACTOR IN PERCENT

Loss of profitability with lack of understanding:	35%
Administration and accounting management problems:	15%
Freight billing reconciliation problems:	12%
Fleet maintenance cost escalation:	10%
W2 in-house drivers versus 1009 subcontract driver issues:	8%
Fleet tracking:	8%
Terminal detention time management:	5%
Measure of contribution to profit by location:	5%
Owners too active in the business:	2%

### CONDUCTING THE ANALYSIS

Analysis team led by:	<b>Mervyn Price</b> with three other staff
Period of Analysis:	3 weeks, 420 man hours
Cost of analysis to client:	\$30,000 plus expenses

This company operated big rigs, which they ran up to 500,000 miles apiece from brand new to disposal. The rig fleet was primarily comprised of Kenwood, Mack, and Peter-Built machines. The company had won awards eleven years in a row for their safety record. The company could take on much more additional business but feared an increased loss in profitability if they did so. The analysis commenced at the Fort Worth Headquarters with a full three day in depth study of the office administration system and the creation of a company wide organizational chart and current operational methodology. Questionnaires with covering letters were also sent to every member of the company at this time with the intent of an analyst would visit each and every site, meet with every manager and supervisor and recovering every questionnaire and report with an aim to

create the first pass at evaluating a company wide co-efficient of efficiency. A strategy was formulated at HQ on the third day for the mobilization of two man analysis teams to visit every location from which the company operated to evaluate the following.

### **Areas Evaluated During Analysis**

1. Slip seating systems, did they exist and how efficient were they?
2. Terminal detention problems, how they were managed and at what cost to the company?
3. Tire rotation and replacement, by rig and trailer, and the variance between new and retread tire efficiency and its impact to profitability?
4. Freight billing systems and any variation by customer or by location that offered areas from which profit could be leaking unknowingly.
5. Mobilization times by location measured against traffic density and customer accessibility.
6. Fleet maintenance programs by location by vehicle by tanker to determine the difference in cost between the best and worst operating system and to establish common denominators from which saving could be identified.
7. Profitability of various products hauled, asphalt versus gas versus aviation fuel by location.
8. The individual contribution to corporate profitability of each location.
9. Cost per mile, by vehicle, by customer, by route by product by day of the week and a full analysis of any variations.
10. Driver mobilization methodology versus driver seat time, detention time and dump time.
11. Full MIS adequacy studies for all locations and an analysis of the variations and the cost of these variations.
12. Administrative management support systems and any inadequacies, duplications or archaic methodologies which impeded the rapid flow of data, and information.
13. Communication protocols internally and externally and the documentation of standard operating procedures to drive the method of company communication.
14. Accounts receivable reconciliation issues and variations across all customers and across all products haul types by location.
15. Vehicle scheduling for mobilization.
16. Volume carried break even analysis, what was the minimum gallon-age a trip could run before the profitability for the run dropped below an engineered standard.
17. Maintenance system management and measurement.
18. Driver, vehicle, route, customer – mileage variations and cost per mile versus miles sold rates per mile.
19. The difference in cost of using a sub-contractor driver with his own rig, a sub-contractor driver using a company rig and an in-house employee driver.
20. Cross dumping problems, frequency, and cost.
21. HQ and regional management accountability and commonality of responsibilities written into their job descriptions and contracts, to identify variations between similar positions in different locations and the cost of the variations when evaluated against reporting methodology and accountability for location profitability.

22. A complete study of the bonus system and any variations that existed in it by position and location and the effects this had on employee productivity.
23. Replacement program management of rigs at certain mileages and certain locations versus what they hauled and when and who drove them the most by study of every rig and driver record.
24. Trailer maintenance and replacement programs.
25. Safety programs company wide in all positions and investigation of compliance of all staff and their ability to quote the relevant OSHA rules governing their job.
26. Trailer location and relocation programs based on usage from location to location against back haul possibilities.

### **Using the 80/20 rule to under promise and over deliver.**

Assuming the 80% to 20% rule, the analysis of this company highlighted these specific areas as being the most critical, and representing approximately 80% of where the principle problems existed, as such the Estimated Savings Detail presented to the owner of this transportation company outlined the fact that the savings presented would probably be only four fifths or less of what was recoverable if a full holistic process of reengineering to correct these issues was undertaken.

The above formed approximately 80% of the areas the analysts would commence to look for improvements to organizational structure, productivity, operational process and efficiencies. From the accurate capitulation of this data, the statistical analysis of it could then be linked to exiting cost structures from which savings could be identified provided the recommended changes were implemented.

### **The use of templates and statistical recapitulation**

This information was gathered in detail from every location and entered into the proprietary mathematical engine used by PPII analysts. It was then entered as hard statistics into the template the PPII analysis division use for establishing clear metrics of savings. This information was at first presented to the client point by point, as a micro, and then each issue was subsequently broken into impact categories which weighted their area of influence. For example what percentage of the problem was a cultural and organizational issue, by department job and function, what percentage was due to operational issues and the lack of functionality of some current operating systems of management, or the fact that some functions which should have been performed were no being performed, and finally reporting issues, whereby measurements from which to make coherent management decisions had not be adequately designed or addressed, causing loop holes in the schematic flow of information such that true measurements of variable cost in the company to create closed loop management methodology were not happening. This was followed by the creation of an estimated saving detail, basing the saving identified and their value to a 90% level.

When the above twenty six areas of variable cost problems were measured the analyst was then able to establish the cost in loss of profitability to the company of the current way things were being handled against a measurement of best practices within the company itself. That is to say, if all moving parts are measured, and the fastest one can complete a function in say one hour at a contribution to profit of one dollar, and the slowest one takes two hours at a zero contribution to profit, then if all aspects of each

area of influence are measured to a 90% standard of the fastest, in that area, then what savings can be made if these changes are designed, implanted, installed and switched on across the entire company and everyone is trained to use them. Now the analyst will usually take each area of measurement and break it down into a snap shot of the current month. The analyst will then take this and annualize it to display the impact of the savings available over a twelve month period, and from this the analyst can then go one step further by studying the contract obligations and the receivable improvements available and show the owner how soon he can start seeing the improvements to profit in that area after the changes have been made.

### **The first pass at defining available improvements to profitability**

The following represents a summary of the exact findings and statistical savings available, by area investigated and these were presented to the owner of this trucking company along with a complete outline as to how it was studied and measured.

#### **1. Slip seating systems, did they exist and how efficient were they?**

There was no standard operating procedure for slip seating. While it did occur, its contribution to profit by increased truck utilization was not measured. It was then determined by best practices from the San Antonio location that when available, if slip seating systems were designed into certain load types on certain routes to certain customers, the company would improve vehicle utilization, reduce detention time, and reduce costs.

The analysis process indicated and improvement to profitability would be available of **\$150,500** per annum

#### **2. Terminal detention problems, how they were managed and at what cost to the company?**

There were over one hundred trucks visiting pipeline terminals everyday and sometimes two to three times a day to tank up with fuel to be delivered. They competed with all the other carriers out there for fill slots times. Many times the average wait state was in excess of two hours. When a brief study was undertaken which linked a call to the terminal, and a rescheduling of delivery times to compliant customers it was determined from the statistics, and with some drivers commencing earlier and being paid over time that an additional **\$237,450** per annum could be added to the bottom line by installing these efficiencies

#### **3. Tire rotation and replacement, by rig and trailer, and the variance between new and retread tire efficiency and its impact to profitability?**

The company owner and managers were absolutely emphatic that they saved a fortune by installing retread tires on their tankers. They had never done a study of down time due to drag off, accident and traffic impact of the thrown tread, on the tread life of a retread versus a new tire and new tire warranties. They also installed all their own tires and had never studied the difference between in-house and out sourced tire replacement and maintenance. When this was undertaken it was determined that the minimum saving available to the company by using new and outsourcing was **\$363,740** per annum

**4. Freight billing systems and any variation by customer or by location that offered areas from which profit could be leaking unknowingly.**

The entire freight billing process was in disarray. While the company had grown its customer base, its operations base, and its fleet, the freight billing department was in a state of continual transition. It did not link to the fleet management and mobilization department electronically; papers were still hand carried across a five acre parking lot. It failed to allow for Hazmat routing, there was serious duplication of effort in an attempt to prevent things falling through the cracks and there was a minimum 23 working day disconnect between the freight bill going to fleet management, and accounts receivable and fleet management returning the customer confirmed freight bill from the field as having been executed and delivered. Such were the inaccuracies of some of the freight bills, they were often disputed and usually these were then discounted, and finally, there was no parity between what was charged per mile for delivery to for one customer and what was charged to another. Usually it was the smaller retail stores who paid more per mile, however they usually had more obscure locations with Hazmat routing issues and no study had ever been undertaken as to how these areas impacted the profitability. The first pass at identifiable savings in this areas found an annualized saving of **\$426,175** could be made by the implementation of some very simple procedures and links.

**5. Mobilization times by location measured against traffic density and customer accessibility.**

The routes used by drivers varied from those advised by freight billing, and there was a 23% overage of mileage against fright bill on average. Likewise no study had been undertaken to identify if the freight bill time deliver time allocation accounted for different traffic conditions to different locations at different times, and in fact if savings could be made by the optimization of traffic conditions and delivery periods. When this study was undertaken a further **\$82,420** could be statistically available as improvements to profit just in the Dallas Fort Worth Metro area.

**6. Fleet maintenance programs by location by vehicle by tanker to determine the difference in cost between the best and worst operating system and to establish common denominators from which saving could be identified.**

Each of the four locations with large fleets was measured for best practices in fleet cost management right down to the truck type, the haul type and the driver and log for that vehicle. Comparisons were then made taking the most efficient fleet maintenance process and applying it to the others to show what the saving would be if all sites and all maintenance systems adopted the same best practices program. The savings identified came to **\$124,500** per annum using this method.

**7. Profitability of various products hauled, asphalt versus gas versus aviation fuel by location.**

The least profitable was gasoline hauled to ranges between fifteen and twenty three miles with single customer loads less than 6,000 gallons. A recommendation as to how to work around this using load and route management systems was made and the annualized savings then calculated. It would reward the company by an additional **\$93,730** per annum

**8. The individual contribution to corporate profitability of each location.**

This entailed a thumbnail P & L financial analysis of each location, with the ratios of employee and management numbers, employee and management costs, number of vehicles, revenue per mile, revenue per vehicle and contribution to profit of each area of management responsibility. It was determined that overall best practices existed in a combination of operations from both the Houston and San Antonio bases. If these were then to be developed and refined and the common denominators of operation installed into the other twelve locations then the company could improve annual profitability by a further **\$443,120**

**9. Cost per mile, by vehicle, by customer, by route by product by day of the week and a full analysis of any variations.**

With an average of 140 rigs making an average of 2.37 hauls per day with an average mileage of 129 miles per run, over 363 day per year, the analyst was able to determine the best operating performance and the worst operating performance. When an 80% standard of the best operating performance was applied to the whole fleet for an entire year the available savings to the company reached an immense **\$721,320**

**10. Driver mobilization methodology versus driver seat time, detention time and dump time.**

No one had ever considered that time and motion management could be improved by undertaking a terminal survey, and a gas station owner drop survey to ascertain if it was possible to fill up during the off periods between 5:00 AM and 7:00AM and 9:00 PM and 11:00PM and make deliveries to stations at this time, then put some drivers onto a split shift system of three hours on, eight hours off and then five hours back on. This reduction in terminal detention time, traffic management and improved driver utilization had attached to it an estimated annual saving of **\$137,400**

**11. Full MIS adequacy studies for all locations and an analysis of the variations and the cost of these variations.**

No CRM linked the sites together, in fact some sites were so archaic their telephone system was the only link (not even fax) and the postal service provided the paper flow. Serious recommendations were made to correct the MIS including the hiring of more experienced personnel and fully linked systems to integrate locations and departments. There was a serious cost associated with this recommendation; however when the improvements to process that it would allow were analyzed as cost against saving on an annualized basis then the overall improvement to annualized profitability came to **\$98,600**

**12. Administrative management support systems and any inadequacies, duplications or archaic methodologies which impeded the rapid flow of data, and information.**

A system schematic of the department was created, with the existing job functions and name inserted. Then an ideal one was created and the duplications or disconnects between the current model and the ideal model were identified and costs applied. This was then built into a recommendation for change and 80% of the difference in costs of now versus the future presented as available improvements to profitability. This figure was **\$54,540** per annum.

**13. Communication protocols internally and externally and the documentation of standard operating procedures to drive the method of company communication.**

An analysis of communication efficiency company wide, undertaken using the proprietary PPI methodology. This indicated that the process as it was, was less than 53% efficient. By recapitulation of the areas of cost to an 80% standard the company would recover a sum to the bottom line. At the time of the analysis, and because of the very multi-headed nature of the company, with so much duplication of effort occurring and systems that did not communicate or link together correctly the analyst made no commitments as to measurable available savings in this area until further research had been undertaken, since correcting many of the previous issues would force up the efficiency of this area anyhow, and saving could not be counted twice.

**14. Account receivable reconciliation issues and variations across all customers and across all products haul types by location.**

This area was a travesty, simply by bringing down the days outstanding from an average of 73 to less than 60 and reducing 50% of the invoicing errors carried an annualized value of **\$239,540**

**15. Vehicle scheduling for mobilization.**

There was a serious disconnect identified between freight billing and fleet mobilization such that no load assessment studies had been undertaken to optimize fleet operations at each location. This resulted in there sometimes being ranks of vehicles waiting for their load and delivery orders standing for hours or days, while sometimes there would be none available for an emergency load to a gas station which had seen a run on sales and needed replenishing. Following a brief statistical study of this phenomenon it was determined that if a system of scheduling was developed for the company and installed correctly so that the exception could be managed and the optimum operational ratio achieved the company could save a considerable amount of money. Because this saving was linked to other areas, and we cannot make claim for the same saving twice, PPII did not place a definitive figure in this area,

**16. Volume carried break even analysis, what was the minimum gallon-age a trip could run before the profitability for the run dropped below an engineered standard.**

This simple best practices study had been attempted many times by the company, but they had failed to factor in a number of issues. When the actual figure had been identified and its application made to the routing and delivery, detention, and volume formulas derived, we were able to determine the breakeven by load, number of loads, by route and by minimum volume per drop. From this we could ascertain best practices and apply it to 50% of the gas and aviation fuel haul fleet. The saving available by maintaining this discipline over twelve months came to **\$187,600**

**17. Maintenance system management and measurement.**

Again, the company had hired some excellent maintenance technicians. They were located at each of the main sites, Houston, San Antonio and Fort Worth. A study was undertaken, which took into account the following coefficients as the variable of the overall equation: site revenue, average age of vehicle, number of vehicles, average mileage traveled per vehicle per site, days down time per truck. This provided the lowest common denominator of maintenance efficiency by truck by site measured in efficiency per mile as a percentage as opposed to cost per mile. Relating maintenance costs by

site back into this, by considering this the 100% efficiency criteria and applying an 80% standard of this to all of those which fell below, the available savings came to **\$95,400** Per annum.

**18. Driver, vehicle, route, customer – mileage variations and cost per mile versus miles sold at rates per mile.**

The company was billing miles from a desk based on a computer mileage generator and not accounting for additional mileage or Hazmat routing enforcement, consequently they were under billing an average of 13.7% per freight bill when the cost per mile they were charging was \$1.57 (this depended on the contracts, the load type and the volume being carried.) When this was recapitulated back into the system as a measurable loss to the company the annual loss identified in this area was a staggering **\$239,800** per annum

**19. The difference in cost of using a sub-contractor driver with his own rig, a sub-contractor driver using a company rig and an in-house employed driver.**

This was a straight forward study of in-house employee overtime, insurance costs and safety cost initiatives. Because there were areas of uncertainty such as whether or not an independent with his own rig was insured by the company or not by the company etc. and whether or not he was paid by the mile, the load or the hour, (so many different systems were in operation) the analyst failed to apply a saving to this area, unless it became a complete and much more in-depth area of analysis. As it turns out, when the client engaged the services of the reengineering division they did undertake the study and reach a defined saving, this will become evident later.

**20. Cross dumping problems, frequency, and cost.**

Cross dumping was regular and costly. It lacked standard operating procedures and delivery process controls, and with the cost of pump out salvage and reclaim a straightforward analysis of this area clearly indicated a cost to the company of **\$87,670** per year which was totally unnecessary.

**21. HQ and regional management accountability and commonality of responsibilities written into their job descriptions and contracts, to identify variations between similar positions in different locations and the cost of the variations when evaluated against reporting methodology and accountability for location profitability.**

There were no standards in play for any of the management group because no standards had been set. It was therefore impossible to measure the cost of something that did not exist. The only recommendation the analyst could make was to design, develop, install, teach and train a standard management operating system and apply it to all the relevant branches accordingly.

**22. A complete study of the bonus system and any variations that existed in it by position and location and the effects this had on employee productivity.**

There was no bonus or incentive system, because the company did not make enough profits to create one. This could not be measured either, but recommendations were made to develop one and quickly.

**23. Replacement program management of rigs at certain mileages and certain locations versus what they hauled and when and who drove them the most by study of every rig and driver record.**

This is a straightforward measurement of truck hours, miles and costs against its age and value when compared to its targeted depreciation table. When examined professionally the exception always jumps out, when these are computed they indicated that the company was not managing this area correctly and it was costing them **\$197,100** per year.

**24. Trailer maintenance and replacement programs.**

Trailers were well kept, and in excellent shape in spite of their age. However many sat around for long periods of time because of being either the incorrect volume or having insufficient chambers etc. so recommendations were made to up grade the fleet and dispose of some trailers. This would optimize the usage across the fleet and save the company about **\$63,600** per year.

**25. Safety programs company wide in all positions and investigation of compliance of all staff and their ability to quote the relevant OSHA rules governing their job.**

The company had seven safety officers all trained and State certified in Hazmat control. The safety manual was fully up to date and all personnel were proficient in its use. The analyst could offer nothing towards annual savings in this area of the company's operations.

**26. Trailer location and relocation programs based on usage from location to location against back haul possibilities.**

The trailer fleet flowed like a school of large silver herring over the period of 5 to 7 weeks, until San Antonio would have huge shortfall of available trailers, Houston would have extra they were not aware of and the parking area in Fort Worth had become a trailer convention site, where they all stood around. The same occurred with the asphalt trailers which traveled much further a field. Consequently this finally brought the realization to the owner that his fleet management system had broken down and his controls for all fourteen locations did not connect correctly which is why he had twice as many trailers operating as he did rigs. It was determined that when corrected this could save the company in excess of **\$215,100** per year.

**Telling the Owner How Much Profit is Recoverable**

Ultimately all this data was assembled into a 128 page Business Analysis Review, along with the recommendations and finally presented to the owner of the transport company. We indicated that we had identified **\$3,240,769** in recoverable profitability for his company which we could start delivery of commencing immediately he engaged corrective services from our reengineering services division at PPII and finally deliver over 12 months with all the commensurate guarantees.

We told him outright it would take anywhere from 2,930 man-hours at the low end to 3,200 man hours at the upper end to achieve and it would cost him anywhere from \$860,000 to \$950,000 over the twelve months.

**How the Owner Could Measure the Deliverable**

We also indicated that prior to engagement he, the owner, would have to see a complete presentation, beyond just the business analysis review, and we would chart and map out the process with time lines and costs as well as what we would underwrite the real cash and accrued savings he would enjoy.

That evening the analysis department spent over eight hours with the reengineering services department of PPI and the entire project was mapped ready for presentation to the client the next day. The following day after an outline of the process the owner engaged and the work of recovering his company to a sensible operating profit commenced.

One of the first functions of the group was to re-confirm the analysis data, by breaking it out into different areas. They identified the issue and described it, then placed an associated saving against it that they could determine, then summed the savings identified in these issues up. If the analysis had been correct, then the new figure identified by the reengineering should be 20% higher than the \$4,259,200 identified by the analyst since the analyst was operating to the 80% rule.

These figures were formally identified as below. The entire engagement took five reengineers seven months and a total of 3,600 hours to complete. Here is the summary of the results, and why this owner of the transportation company is so pleased.

Analysis Commitment : **\$3,240,769 improvement to profitability (5.7% of revenue)**

<u>Issue Description</u>	<u>PPII savings (first pass)</u>	<u>savings achieved (actual)</u>
Overtime	\$275,625	\$393,750
Accounts Receivable	\$645,568	\$1,317,271
Cross Dumping	\$175,000	\$350,000
Mileage	\$1,396,821	\$4,190,464
Mobile Communications	\$95,203	\$95,203
New Tire Savings	\$97,042	\$97,042
Tank Wash	\$200,000	\$200,000
Line Equipment	\$364,668	\$588,212
Equipment	\$364,668	\$2,111,671
Dispatch Systems	\$523,212	\$588,212
Depreciation	\$151,717	\$151,717
Insurance	\$500,000	\$1,300,000
Fuel Savings	\$73,930	\$147,860
Driver Retention	\$134,150	\$536,600
Shop Link	\$320,452	\$609,552

Total Savings identified by the reengineering group at first pass after the analysis hand over was **\$4,980,945**. This 54% higher than the savings committed to the owner by the analyst division of PPII.

The total saving identified and signed off was **\$12,232,682** annualized

This company recovered from a net **(3.34%)** loss to an 8% profit in less than twelve months and improvement of over 11%,

The fees for these service totaled \$936,000 over the seven months.

Break even (when improvements to process bring in more money than the cost of reengineering) occurred at week 13 when the client had only expended \$354,000

The client received a **5.3:1** return on his investment, through first pass savings and a total return on his investment exceeding 13:1 on total savings identified.

This is a typical case study on a transportation company and its moving parts.

*This case study was written and compiled from real data from a real client. This a case study was drafted by Mervyn Price who was the lead analyst on this project and guided the client through the derivation of finds and an introduction to reengineering corrective processes.*