Agricultural Transportation Intermodal Rail Study

Market Feasibility and Economic Assessment

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In preparing this report, we have relied on information obtained from our discussions with Client on the accuracy of the documentation they provided to us. Any material misrepresentations or omission of facts or data provided by Client could significantly alter our conclusions. Our conclusions are based on the completeness and accuracy of the facts and assumptions stated in the report. These facts and assumptions were believed to be reasonable when the study was conducted. Client has agreed to and will indemnify and hold harmless Real Options Valuation, Inc. and its personnel from any claims, liabilities, costs and expenses relating to our services under this report.

Introduction

Dr. Johnathan Mun ("Economist") was approached by Mr. Stephen P. Collins to assist in the economic feasibility study in utilizing rail carriers for the transport of agricultural products in addition to the current direct ship by trucks to the market. The analysis is performed at the request of the Transportation Agency for Monterey County ("TAMC"), the County of Monterey and the City of Salinas to research if the rail solution is a realistic solution, if it is economically feasible, and if the industry supports the concept.

The analysis performed is outlined in this summary report, complete with the assumptions used and results obtained. This report starts with a case background illustrating the initial thought process involved in the economic feasibility analysis of the intermodal rail initiative. This preliminary analysis is purely qualitative in nature and covers the critical risks, key decisions to be made, the economic, financial and environmental impacts as well as proposing some strategic options and alternatives. This section is meant to be cursory and purely qualitative because it is not the intent of this economic feasibility study to perform any detailed analysis on the environmental impacts or to provide any counter proposals, but merely to identify some of these key issues. Additional detailed analysis in any of these areas can be performed later if required. The report then proceeds by focusing on the central element of this study, the economic feasibility, by first identifying the critical input data requirements in the financial model. Then, a financial and economic model was developed and analyzed. Due to the lack of exact data and precise information, we utilized the application of Monte Carlo risk simulation whereby each of the critical assumptions were simulated tens of thousands and even hundreds of thousands of times to incorporate the element of uncertainty and risk in the forecast and approximations. This way, the confidence and precision of the model results are higher and more robust. That is, instead of relying on single point estimates of certain inputs, we were able to incorporate a range of potential inputs and created multiple alternate scenarios and situations. In addition, to create additional scenarios, we even modeled the fact that the trucking industry might provide a counterproposal by reducing some of its rates in an attempt to recover lost business, or when the larger shipping companies using the rail initiative as leverage to negotiate lower rates.

In the final analysis, it is the recommendation and conclusion of this financial economist that the intermodal rail initiative is a credible and highly valuable alternative and supplement to the

existing trucking routes for the shippers and growers in California, specifically for the Monterey County and its surroundings. The details of the analysis follow.

II. Case Background

In order to perform the analysis, telephone and e-mail discussions ensued between Economist and Mr. Collins, for the purposes of data gathering and assessment of the situation. Figure 1 illustrates a graphical summary of the discussion's outcome. Figure 1 illustrates several critical areas of analysis, including the critical decision of whether the status quo of continuing the usage of trucks and existing modes of transportation is the best alternative, as compared to using a mixed intermodal rail with existing modes such as trucks. In this report, we outline the risks associated with each decision and provide our expert economic impact assessment. However, in the future, additional work can be performed to analyze and decide on the optimal portfolio allocation (i.e., what percentage can be shipped by which mode and under what circumstances will the allocation change, such as when the price of oil/transportation decreases below a certain threshold, making it more economically sound to exercise one option versus another).

In order to perform a more detailed financial and economic analysis to determine the economic viability of using intermodal rail, we have to look into the key risks and uncertainties in the project. The most obvious is the uncertainty of and the risks of price of oil and gas increasing and continue to be volatile over the foreseeable future. As the price of oil is the main economic driving force of the cost increase in truckloads, this cost gets passed on to the customers, making California produce a lot less price competitive. The use of intermodal rail will reduce the cost and hence reduce the fluctuations of fuel and transportation surcharges to the customer, providing a higher level of price stability and increasing the competitiveness of California produce. It also helps California growers to maintain a more stable profit margin over time, reducing any unnecessary price and profit fluctuations and added risk in the market. For this stability and competitiveness reason alone, California growers and shippers should very quickly embrace the concept of using intermodal rail as an alternative transportation mode.

Nonetheless, there are still risks involved with intermodal rail such as reliability and quality of the produce first need to be determined as the maintenance of the cold chain has a major impact on the quality of the produce delivered. As such, additional economic and strategic financial analysis

concludes that several strategic options exist for this new intermodal rail system. For instance, there are multiple types of options such as:

- Option to Expand. In the situation where outgoing Eastbound trains are usually fully utilized, return trips Westbound oftentimes have empty rail cars. The additional capacity of empty rail cars can be leased out to other firms and businesses. For instance, UPS or FedEx might be interested in taking on the additional capacity as their current ground transportation are also facing increased pricing pressures due to oil price fluctuations, and in most cases, their current capacity utilization are at their maximum. Additional options to expand include the expansion into other interline locations if and when necessary, as most of the infrastructure exists or will be built as part of this plan, as long as there exists ability to expand (modular development), then this option may become very useful and profitable in the near future. In addition, additional rail cars, routes and schedules can be added if additional capacity is required in the future.
- Option to Contract. Should the price of oil decrease significantly and fall below the cost of using trucks, the intermodal rail can be scaled back as required. And the delivery methods can be mixed and reallocated as required. This option exists only if there are no contractual requirements of any minimum shipments via rail.
- Option to Switch. This option simply means the ability to mix and match or switch back and forth between rail and truck transportation depending on the economic situation. Having an option to switch is extremely valuable to the produce growers and shippers in California. The entire economic study can be simply described as providing the growers and shippers the ability to choose and switch, instead of relying solely on trucks, where there is limited capacity as well as having higher and more significant price/cost fluctuations.
- Option to Phase. This is a sequential option or stage gate option, whereby a proof of concept stage for several months can first be implemented, to work out the kinks in the system and to determine the quality control (determining among other things, the ability to sustain the cold chain). Only when such a proof of concept is successful, will the second phase of more shipments be implemented. Such a

preliminary test can also allay any fears and uncertainties in the minds of the growers and shippers, as well as questions that can be raised by the customers.

- Option to Abandon. In the situation where shipping by rail is no longer economically viable, this entire mode can be scrapped and abandoned. That is, because the development costs of the new rail lines are completely borne by Railex and its associates, the county has no losses or even sunk costs to speak of, and completely switching back to traditional trucks would be a viable option.

The environmental impact is also a critical component. By using intermodal rail, we can lower our carbon footprint by up to 67% as compared to using trucks alone (this figure is an approximation and not externally validated, but is nonetheless indicative of the magnitude of reduction). Transportation by rail is a lot cleaner and has less pollution than by trucks. In addition, the roadways in the county and surrounding areas will be less congested and the quality of the roads can be better maintained. Finally, the environmental and social impacts are very minimal as the existing unused rail tracks and new rail tracks can be run through unpopulated or less populated areas.

Finally, there are clearly additional economic and financial impacts to the county, growers and shippers industry, as well as to the country as a whole by looking at additional externalities such as the impact to lowering food cost, reducing the dependency on foreign oil and hence doing our part, regardless of the magnitude of the impact, to national security. By lowering costs, the industry in California can maintain its competitiveness and help keep jobs locally in the county. Clearly, these are qualitative issues only as the central analysis of this economic feasibility study is the quantitative financial economic impacts starting in the next section. Figure 2 illustrates the data requirements for the quantitative economic analysis.

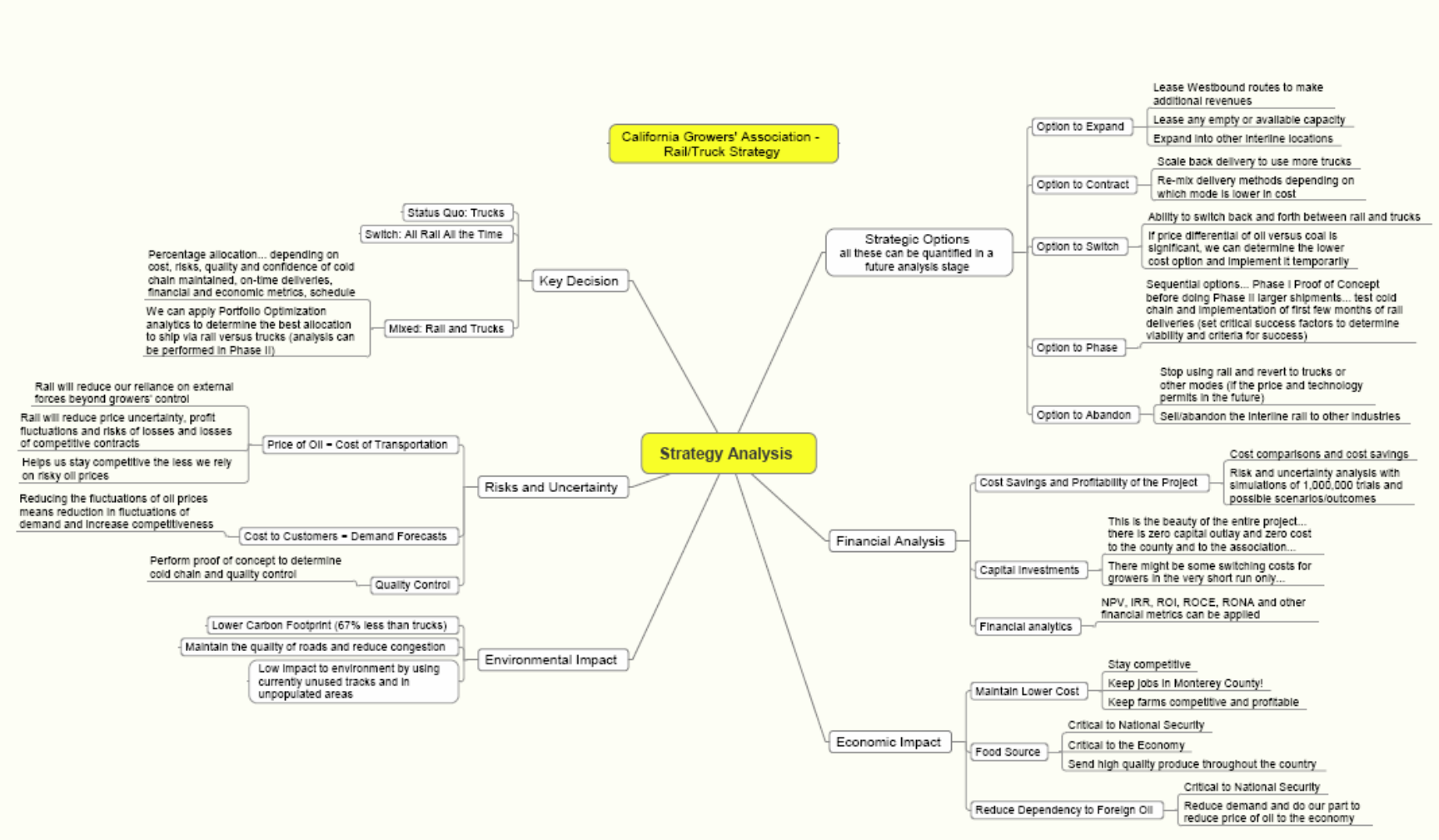

Figure 1: Economic Analysis Road Map

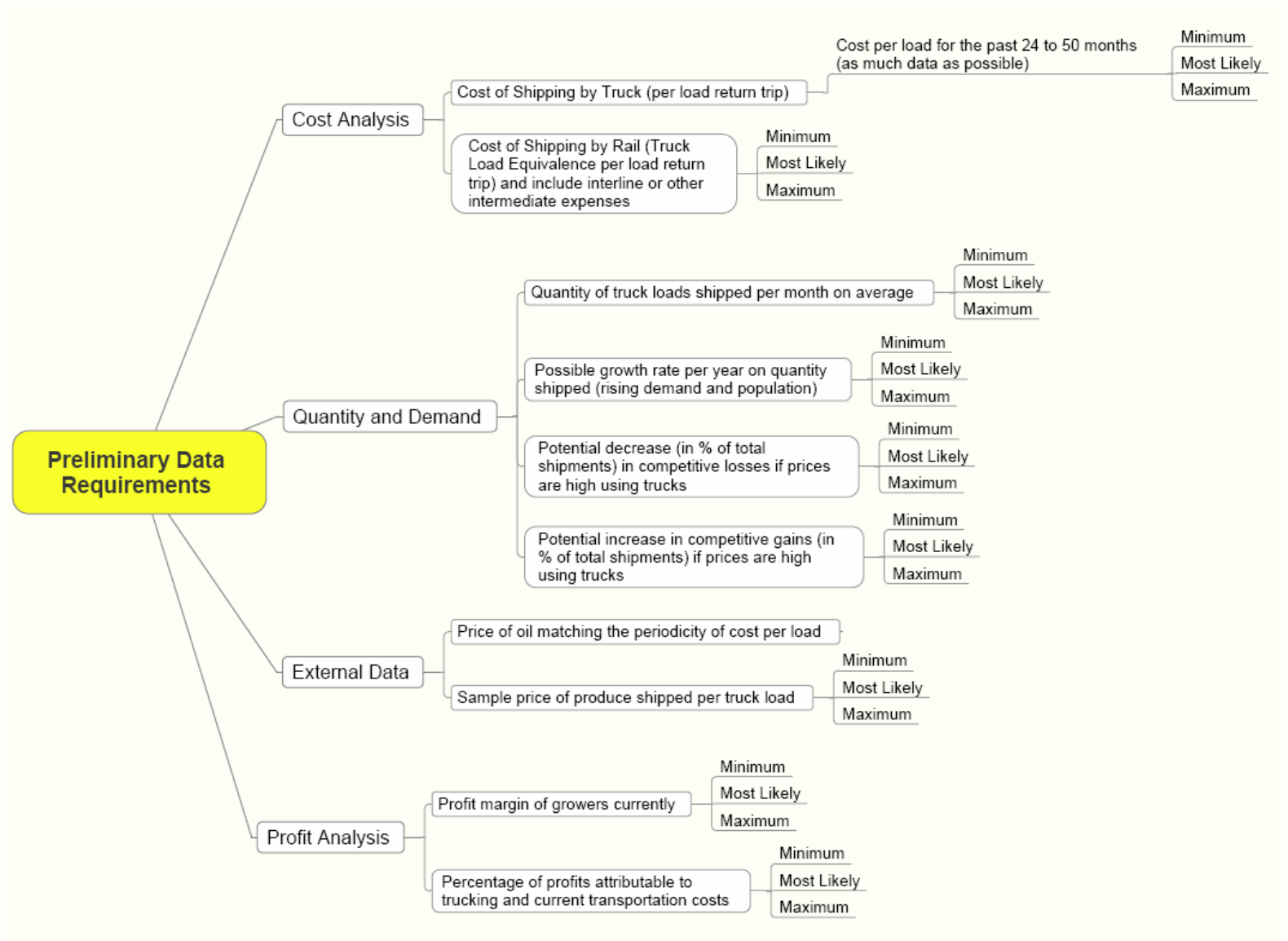

Figure 2: Data Requirements and Financial Impact Analysis

III. Economic Impact and Financial Analysis

Figure 3 illustrates a portion of the economic feasibility model that was developed. The items highlighted in green are simulated thousands of times, based on the input ranges (minimum, most likely and maximum values). For instance, we know that the most likely equivalent truckloads per rail car is about 3.2, there might be situations (e.g., depending on the route, timing, specific grower-shipper company, and produce type) where the rail car equivalence can be as low as 3 or as high as 3.4. Figure 3's values are fairly self-explanatory and intuitive. Based on the analysis, we show that there is a potential savings of upwards of $227 million per year to the entire shipper-grower industry as a whole, by implementing the intermodal rail transport, which represents an average savings of about $0.29 per carton or an increase of up to 29% in profit margin per carton for the shipper-growers. This represents a significant savings and profit for the industry and proves to be a compelling economic and financial argument for using rail transport.

In addition, Figure 5 illustrates some of the simulation results of the analysis. For instance, we can see that by running the thousands of simulated outcomes of different truckloads shipped per day, the average equivalent truckloads per rail car, the cost per truckload via trucks and rail, the profit margin per carton and the average number of cartons that can be loaded per truckload, we were able to simulate all possible outcomes and scenarios tens and hundreds of thousands of times. The results indicate that on average, after accounting for all the risks and uncertainties, the average savings per year is about $225 million to the shipper-grower industry. In fact, this number is quite robust because even with the worst case scenario (i.e., defined as the worst case 5% of the time, the average savings per year still exceeds $182 million. This is translated into an average shipping cost savings of anywhere between $0.21 and $0.33 per carton, or at least an 18.61% increase in profit margin per carton, with potential savings of up to 42% in the best case scenario.

For the sake of completeness, we re-ran the analysis assuming that the trucking industry will feel the competitive pressures from rail and subsequently reduce its rates in order to stay competitive, or perhaps the shipper-grower groups can use the rail transport system as leverage to negotiate lower prices or perhaps there are existing larger contracts with lower per shipment price levels. The model is shown in Figure 4 and the results are shown in Figure 6. Here we still see a significant savings for the industry as a whole, with an average savings of $165 million per year even with the reduced rates, corresponding to a $0.20 average cost savings per carton (21% increase in profit margin). Finally, we added a highly conservative scenario where trucking cost is reduced to be between $6,000 and $8,000

(equally likely), the situation still shows an average savings of $45.92 million per year even with the reduced rates, corresponding to a $0.0554 average cost savings per carton (5.81% increase in profit margin) as seen in Figure 7. These analyses provide a very compelling argument for the industry and for the County to seriously consider the rail initiative.

		Min	Likely	Max
TRUCKLOADS				
Truckloads Per Day	2,500	2,500	2,500	3,000
Shipping Days Per Week	6			
Shipping Weeks Per Year	52			
Total Truckloads Shipped Per Year	780,000			
RAIL				
Equivalent Truckloads Per Rail Car	3.2	3.0	3.2	3.4
Cars Per Full Train	60			
Equivalent Truckloads Per Full Train	192			
Shipping Days Per Week	6			
Shipping Weeks Per Year	52			
Equivalent Truckloads Per Year	59,904			
Percentage Equivalent Truckloads Per Year	7.68%			
COST ANALYSIS				
Cost Per Truckload (Return)	$10,000	$9,000	$10,000	$11,000
Cost Per Truckload Equivalent via Train (Return)	$6,200	$6,000	$6,200	$6,500
Savings Per Truckload via Train	$3,800			
Savings Per Year via Train	$227,635,200			
COMPETITIVE COST REDUCTION				
Average Cartons Per Truckload	1,000	900	1,000	1,100
Total Cartons Shipped Per Year	780,000,000			
Cartons Shippable via Rail	59,904,000			
Cartons Shipped via Trucks	720,096,000			
Average Shipping Cost Per Carton (Trucks 100%)	$10.00			
Average Shipping Cost Per Carton (Trucks and Rail)	$9.71			
Average Shipping Cost Savings Per Carton	$0.29			
Average Profit Margin Per Carton	$1.00	$0.50	$1.00	$1.50
Percentage Increase in Profit Margin Per Carton	29.18%			

Figure 3: Economic and Financial Impact Analysis Summary

Economic Analysis of Grower-Shipper Association of Central California's Train versus Truck Mode

		Min	Likely	Max
TRUCKLOADS				
Truckloads Per Day	2,500	2,500	2,500	3,000
Shipping Days Per Week	6			
Shipping Weeks Per Year	52			
Total Truckloads Shipped Per Year	780,000			
RAIL				
Equivalent Truckloads Per Rail Car	3.2	3.0	3.2	3.4
Cars Per Full Train	60			
Equivalent Truckloads Per Full Train	192			
Shipping Days Per Week	6			
Shipping Weeks Per Year	52			
Equivalent Truckloads Per Year	59,904			
Percentage Equivalent Truckloads Per Year	7.68%			
COST ANALYSIS				
Cost Per Truckload (Return)*	$9,000	$8,000	$9,000	$10,000
Cost Per Truckload Equivalent via Train (Return)	$6,200	$6,000	$6,200	$6,500
Savings Per Truckload via Train	$2,800			
Savings Per Year via Train	$167,731,200			
COMPETITIVE COST REDUCTION				
Average Cartons Per Truckload	1,000	900	1,000	1,100
Total Cartons Shipped Per Year	780,000,000			
Cartons Shippable via Rail	59,904,000			
Cartons Shipped via Trucks	720,096,000			
Average Shipping Cost Per Carton (Trucks 100%)	$9.00			
Average Shipping Cost Per Carton (Trucks and Rail)	$8.78			
Average Shipping Cost Savings Per Carton	$0.22			
Average Profit Margin Per Carton	$1.00	$0.50	$1.00	$1.50
Percentage Increase in Profit Margin Per Carton	21.50%			

* Assumes 50% at $10,000 and another 50% at $8,000 bulk preferential pricing

Figure 4: Economic and Financial Impact Analysis Summary (Preferential Pricing)

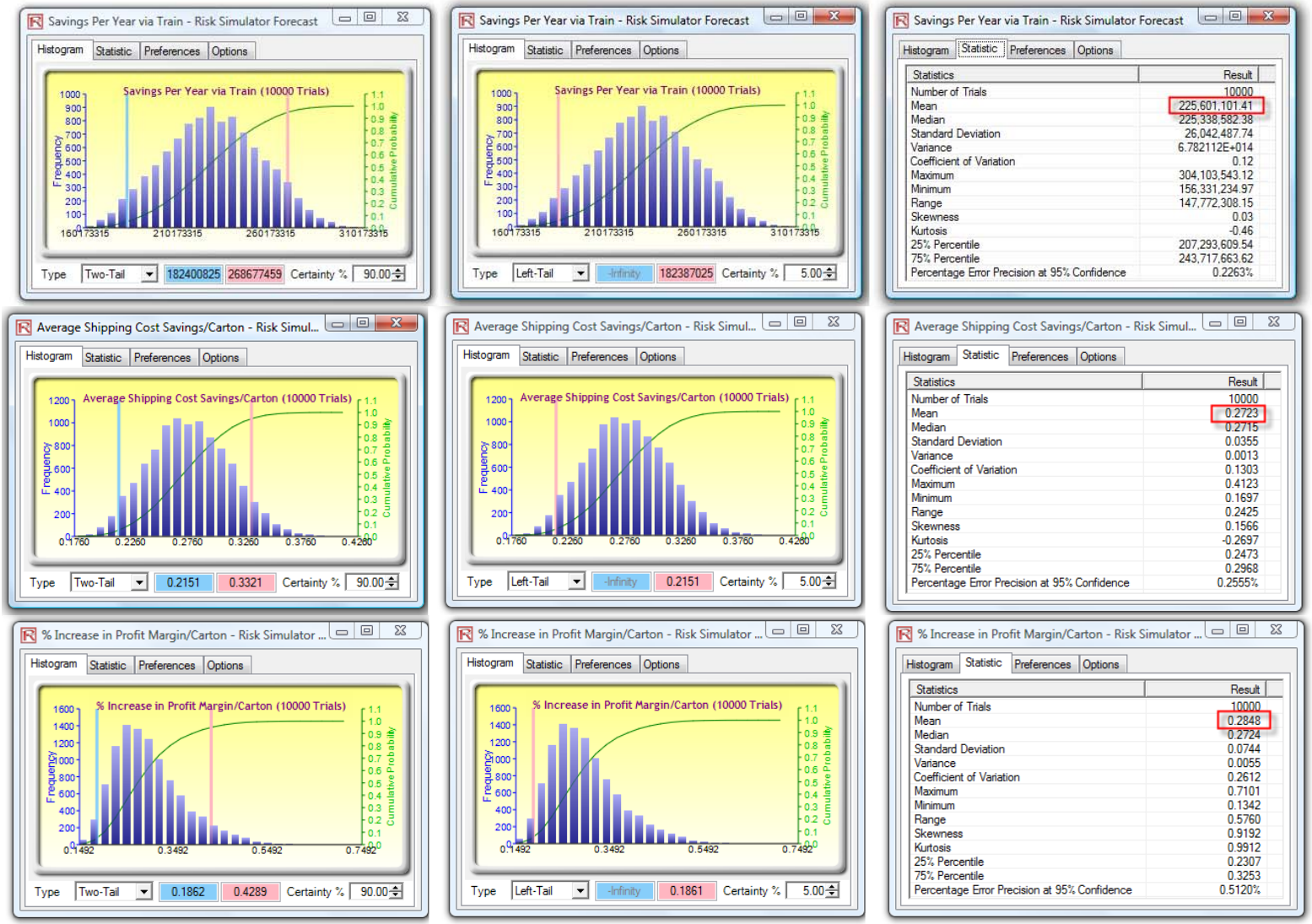

Figure 5: Risk Simulation Results

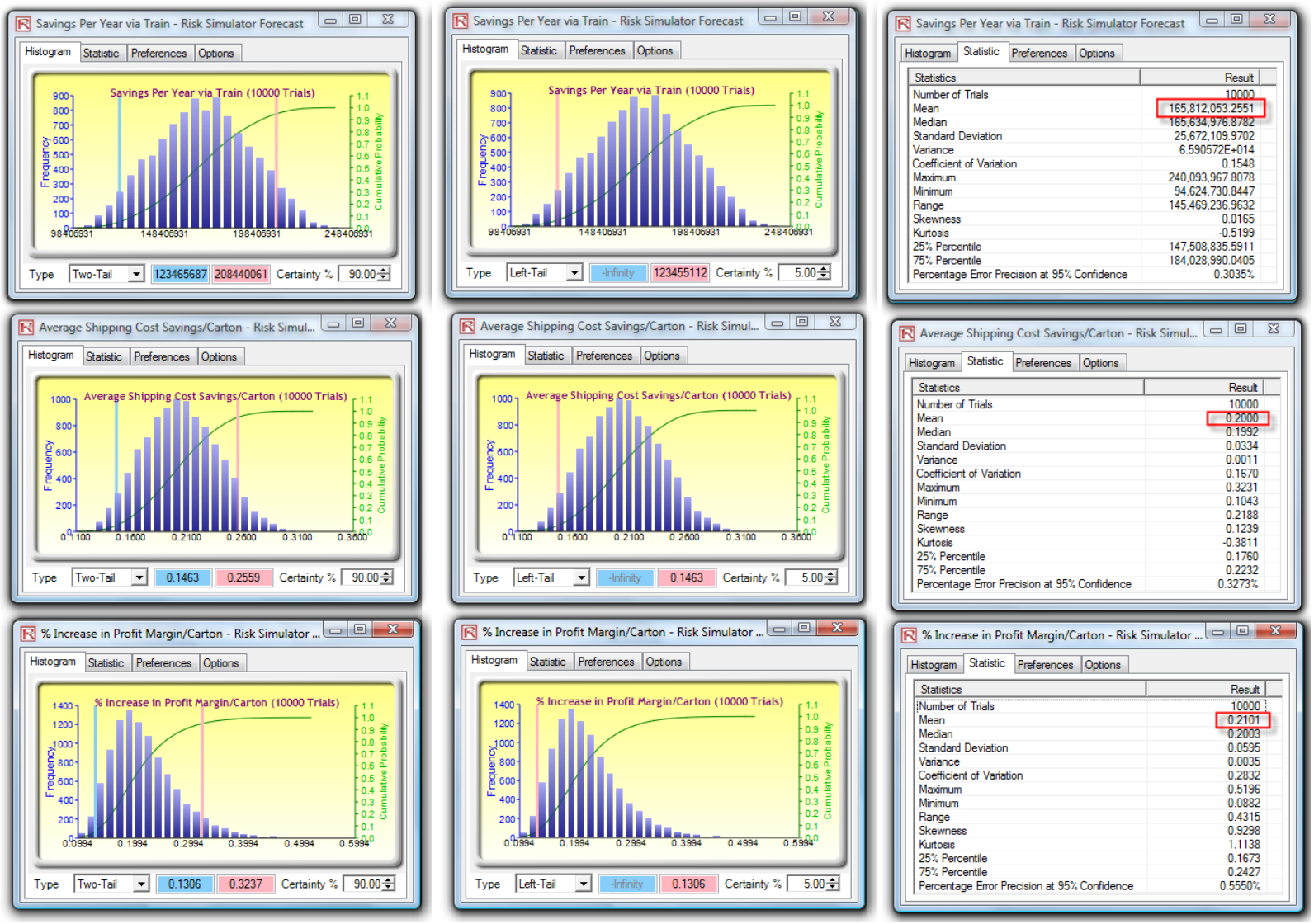

Figure 6: Risk Simulation Results (Under Competitive Trucking Costs)

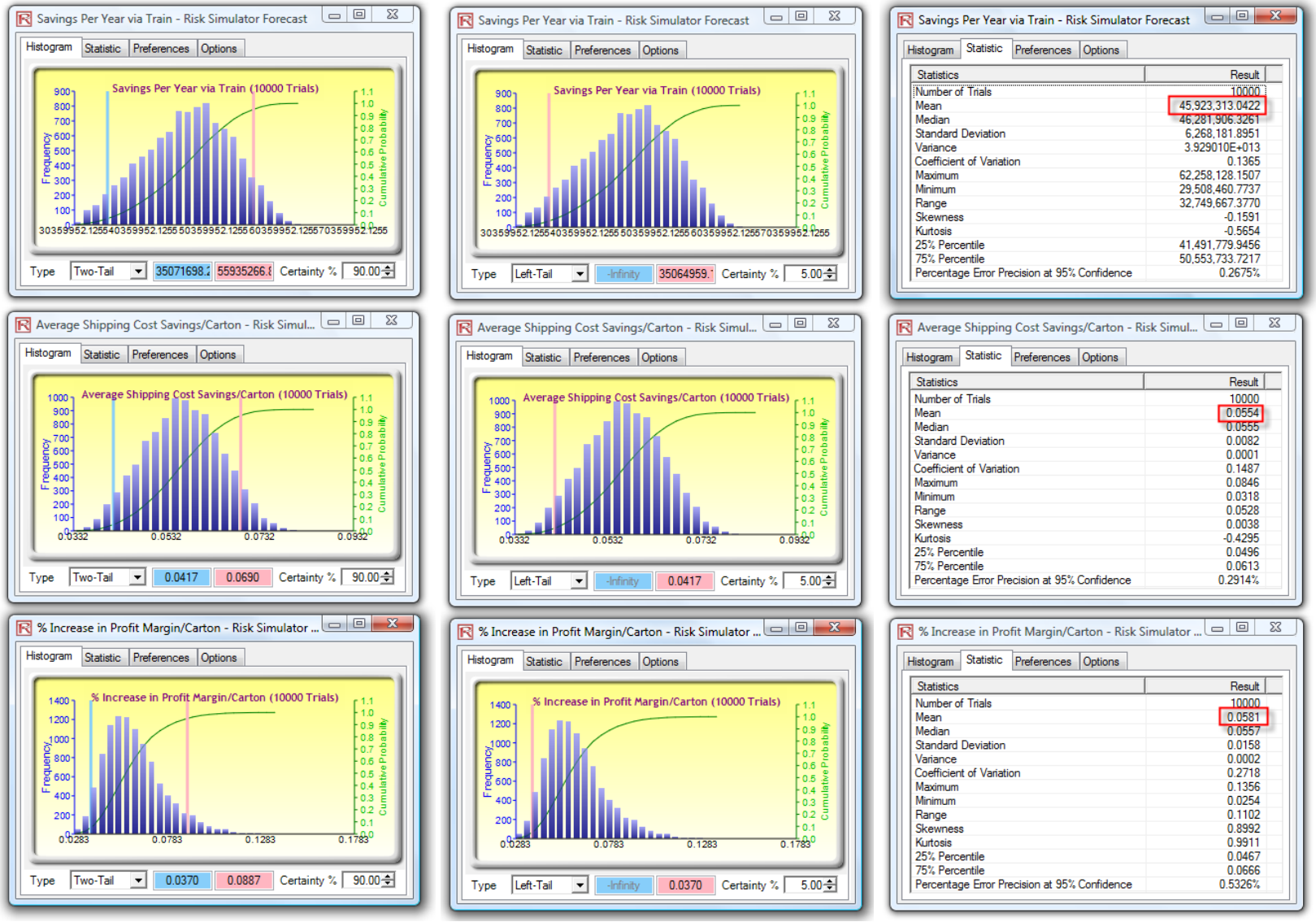

Figure 7: Risk Simulation Results (Under Highly Conservative Trucking Costs)

IV. Methodology and Inputs

This section of the report explains the methodology applied and the validation of the input assumptions used in the economic impact analysis.

As it would be impractical and impossible to survey or canvass all of the agricultural firms and shipper-growers in the County to obtain the input data required to run the analysis, we have resorted to using averages as a starting point, and lay on top of these average levels, different probability distributions (whose limits were defined using minimum, most likely and maximum value ranges), and the analysis is then run through tens and hundreds of thousands of scenarios and simulations using the Risk Simulator software. The results will then be robust and incorporates all of the uncertainties in inputs as well as the business reality and variability of different shipper-growers. Therefore, instead of having to rely on exact values or determining what the level of precision might be for each input, we compute all possible permutations of possibilities in the model and obtain results in terms of probability distributions.

Finally, to further determine if the inputs are valid, we have circulated early drafts of this report to several subject matter experts and industry specialists/experts to vet their reliability. In this vetting process, the idea was to determine the “reasonableness” of the inputs, on average, with the understanding that there will be differences among different companies and shipper-growers in general.

V. Conclusion and Next Steps

It is the conclusion of this economic feasibility analysis that the rail initiative provides a significant and positive impact to the County of Monterey and its surrounding areas, as well as to the shipper-growers in the area, in terms of financial economic consequences as well as other externalities including the environment. The analysis indicates significant savings to the shipper-growers, providing a higher level of profit margin and reduces the variability in revenues over time, as well as providing a legitimate alternative option in terms of transporting produce to the market. It is therefore the recommendation of this economist to the County and transportation board to seriously consider the implementation of said rail transportation system.

Depending on the party or parties interested in pursuing the funding of this initiative, a follow-up analysis should be done, specifically, looking at the cost-benefit analysis of this investment. The analysis should look at the various cash flows generated from the project and with the development of net present value, internal rate of return, return on investment and other financial metrics, for the purposes of raising funds, valuation, and decision making. Further, the analysis should also consider the various strategic options or pathways that the project can be developed (single track, multiple tracks, what is the optimal number of rail cars to have, the possible demand and pricing forecasts, potential profitability levels, breakeven levels, and so forth).

Appendix

For the sake of completeness, this appendix outlines the facts provided by Mr. Collins in support of the economic analysis. All of the economic and financial analytics performed were based solely on the information furnished from this appendix and Economist has neither confirmed nor found any evidence that showed values contrary to those stated by Mr. Collins.

COST ANALYSIS:

Cost of Shipping per Truck. We refer to shipping costs per truck as for a full load of produce, going west to east to a terminal market or major customer. A "straight load" of iceberg lettuce is 976 cartons, palletized, and cooled the entire way in transit, with a 3 to 4 day transit time. Depending upon the commodity in question, the number of cartons will vary, as a celery box is larger than lettuce, while cauliflower is smaller. For our purposes an average of 1,000 per truck would work well mathematically, and be statistically relevant within a standard deviation. The current cost to ship this load of produce to the East Coast is $10,000 to $11,000, depending on truck availability, etc. Again, the $10,000 is more prevalent and a good conservative number to use. Hence, it costs approximately $1.00 per carton for freight cost in transit.

It is impossible to track the freight increase precisely over the last 50 months, but the cost of shipping a load of produce from the west to the east has essentially doubled in the last 12 to 15 months. The standard load rate for such a produce load was considered to be $4,000 to $5,000, depending on location. Since the number of cartons of produce has not changed in that time period for a "straight load" the cost impact is quantifiable and direct.

I think it is important to note that virtually all produce is shipped FOB California which means the cost of the freight is actually borne by the buyer. It is very rare that the shipper pays the cost, however, the impact to the shipper is significant due to the cost increase. The customer for the grower-shipper is the large chain store (Safeway, Wal-Mart, etc) and they buy produce based on the total cost to them and the margin they can make when they, in turn, sell to their customer, the consumer. The price increase for the freight gives a competitive advantage to the competitors in Midwest states and other locations that can only grow in the summer and their quality is not as good as California. The cost advantage, however, has a significant impact on California produce as orders are impacted to the negative and much of our produce will have to be discounted to account for the cost differential in freight. You could build a successful argument that the California shipper does indeed bear the brunt of the cost increase due to freight.

Cost of Shipping by Rail

This will be a complete estimate based upon pricing provided by Union Pacific for utilization of the rail lines and cars if the loading docks and infrastructure are built by someone other than them; and the pricing provided by Railex, an independent provider of rail service to the East Coast. Union Pacific is simply a vendor of freight service, they do not load the cars, they simply provide access to their rail lines and will lease refrigerated rail cars and locomotives, with crews, to the supplier of service. They have indicated a cost of approximately $3,000 per full train (considered to be 4 engines and 60 cars) from the west to a preset destination in the east, with no stops in between. This is a perfect model for us.

Railex has currently built a business model which seems very efficient to us and is working effectively in the State of Washington. They built a state of the art facility in Walla Walla, Washington that receives, loads and ships agricultural commodities to a direct warehouse, in New York State, also owned and managed by them. Agricultural shippers transport their commodity to the shipping point in a refrigerated trailer and the produce is then unloaded and reloaded onto refrigerated rail cars. It is then transported nonstop to New York where the customer takes delivery of their order. As an example, Wal Mart buys 10,000 cartons of broccoli from Shipper A, and instead of paying a truck to pick up the commodity in Washington, they pay the same truck to pick up the commodity in New York and transport to various locations on the East Coast. Railex is currently charging the equivalent of $6,000 per truck for delivery to the East Coast for the produce. This cost includes the fee they are paying Union Pacific for the items mentioned earlier. Some statistics for you, a refrigerated rail car holds approximately 3.2 fully refrigerated “18 wheel transport” trucks. The Salinas Valley ships on average 2,500 fully loaded trucks per day, or slightly less than 800 rail cars. The most we can physically load and transport out of the valley daily is 60 cars, or a “full train”. Obviously we will be strategic in determining the most effective products to ship by rail.

There are several well respected large shippers in the Salinas Valley that currently ship produce from the Salinas shipping point, by truck to Washington and utilize the Railex service. They are convinced the savings are significant enough to follow this strategy even with the cost and time element of shipping the produce to Washington for East Coast transport. They will not share exact cost numbers with the industry, but they are very successful and common sense alone dictates that they would not follow this strategy if it was not cost effective. Railex is constructing a similar facility in Delano and will commence operations at that facility on or around September 15, 2008. The capital cost, including land acquisition, was $54M, per Railex and based on the specifications for sizing, I would assume a similar cost in the Salinas Valley. Land cost per acre

would be higher, but Railex purchased significantly more land than needed for this operation due to other considerations, so it is fair to assume a cost offset.

Railex has not yet released their pricing structure for the Delano facility, but their representative assured me that it would be similar to Washington, so lets assume a CPI increase for the year and utilize $6,200 per equivalent truck freight cost.

The final discussion point for the costing is difficult to quantify, but I am going to make a business assumption. There are many farmers and shippers in the Salinas Valley that have an uncommon tolerance for risk and vision. Assuming this business model makes sense economically, I envision several of these individuals, or perhaps one of the large enterprises assuming the role of Railex in this scenario. Union Pacific has indicated a willingness to work with any qualified operator of transport via their lines and equipment. Our business model is built on a third party, ie: Railex supplying the capital and building ROI and investment amortization into their pricing. This cost evaluation would change somewhat if independent third parties with internal economies of scale and competitive advantage essentially took on this challenge for themselves.

One other element to consider as a revenue enhancement potential, or a cost offset, if you prefer. The trains, while refrigerated, can be shut off and run with dry drayage. The trains historically, per Union Pacific, on these routs run at 10% capacity on the return leg of the trip. We have had preliminary conversation with United Parcel Service to utilize our units to transport goods from the New York docking area to California. For modeling purpose lets assume we could have a 50% utilization of the rail cars for return. It is important to note that the return trip is built into the $6,200 equivalent cost per truck charged by Railex.

QUANTITY AND DEMAND

Quantity of trucks shipped per month. Shippers form the Salinas Valley are in business 12 months out of the year and simply “follow the sun”. A typical shipper will move from the Salinas Valley in the fall to the southern deserts and then return before spring. The most likely volume is 2,500 trucks per day, with 500 in either direction for a plus or minus factor. Assume 6 days a week for shipping even though we occasionally ship on Sunday.

Possible growth

Land is the principal factor in growth potential. There are 220,000 irrigable acres in the Salinas Valley and I do not envision much of an increase. The wine industry has done an excellent job in

drip irrigating land that was deemed non-farmable years ago, but the growth potential for row crop (lettuce, celery, broccoli, strawberries, artichokes, etc) is limited. Water in the desert areas is currently limiting significant expansion therein. Rising demand is the hope of the marketing folks, but as an accountant I prefer keeping supply steady, increasing demand and therefore price per unit on sale. Agriculture is a very pure supple\demand model and variance in supply has a direct effect on price per unit.

Potential decrease in competitive loss. During certain times of the year, California is primarily the sole source of many products, however, that concept is changing as technology evolves seed types, irrigation methods and cultivation practices. As discussed earlier, the cost of product to the customer is the essential element and any long term sustained cost disadvantage will have a negative impact on California produce and by extension the Salinas Valley. Potential increase in competitive gain if truck prices remain high. None that I can envision.

EXTERNAL DATA

Price of oil matching periodicity of cost per load. This is difficult for me to quantify as I have no direct knowledge of the price movement of oil. I have to assume that oil, while reaching historic levels, will remain relatively high, most certainly $100 per barrel or in that range. There is no viable alternative to oil based products in the near future, nor is there a mechanism to increase supply or processing of the oil we currently can drill. In short I do not see this as a short term issue.

Sample price of produce shipped per truck load. This varies widely by commodity, supply, weather, time of the year, etc. There are no set prices unless a customer is on a fixed price contract and those represent a small percentage of the business in American produce. This is essentially an open market system and varies by grower due to quality, type of customer being served, domestic versus foreign site of sale, etc. The most likely price across the board for all commodities that would be reasonable for analysis would be $11 per carton. Please understand this is the most easily attacked number in this analysis, but for broad purposes is at least reasonable.

PROFIT ANALYSIS

Most large growers\shippers are vertically integrated and well diversified. They own most elements of the business cycle that affects their crop and its successful delivery to market. The most profitable model is own the land, grow the crop, own the harvesting company that harvests and packs the commodity, own your own cooling facility and sell you own product. For many growers these are cost centers, for the successful grower\shipper these are also profit centers. These are the individuals I refer to earlier regarding the potential for owner ship of the rail center. For analysis purposes let us assume we are talking about the more sophisticated members of our farming community and assume vertical integration. Minimum profit margin= $.50 cents per carton, most likely $1.00 per carton and maximum $1.50 per carton. You can now visualize why a $.50 per carton increase in freight cost is so tenuous.

Consultant Biography

DR. JOHNATHAN MUN, Ph.D., MS, MBA, BS, CRM, CRA, FRM, CFC, MIFC

Dr. Johnathan C. Mun is the founder, Chairman and CEO of Real Options Valuation, Inc. (ROV), a consulting, training, and software development firm specializing in strategic real options, financial valuation, Monte Carlo simulation, stochastic forecasting, optimization, and risk analysis located in northern Silicon Valley, California. ROV currently has partners in California, New York, Chicago, Mexico, Chile, Switzerland, Australia, Japan, and a local subsidiary in Shanghai, China. He is also the Chairman of the International Institute of Professional Education and Research (IIPER), an accredited global organization providing the Certified in Risk Management (CRM) designation among others, staffed by professors from named universities from around the world. He is also the creator of the *Modeling Toolkit* software, *Real Options Super Lattice Solver* software, *Risk Simulator* software, and *Employee Stock Options Valuation* software at the firm, as well as the risk analysis Training DVD and he holds public seminars on risk analysis and Certified in Risk Management (CRM) programs. He has authored ten books including *Basel II Handbook on Credit and Market Risk* (Elsevier 2008), and *Advanced Analytical Models: 800 Applications from Basel II to Wall Street and Beyond* (Wiley 2008), *Modeling Risk: Applying Monte Carlo Simulation, Real Options, Optimization, and Forecasting,* (Wiley 2006), *Real Options Analysis: Tools and Techniques,* First and Second Editions (Wiley 2003 and 2005), *Real Options Analysis Course: Business Cases* (Wiley 2003), *Applied Risk Analysis: Moving Beyond Uncertainty* (Wiley 2003), *Valuing Employee Stock Options* (Wiley 2004), and others. His books and software are being used at top universities around the world (including the Bern Institute in Germany, Chung-Ang University in South Korea, Georgetown University, ITESM in Mexico, Massachusetts Institute of Technology, Naval Postgraduate School, New York University, Stockholm University in Sweden, University of the Andes in Chile, University of Chile, University of Pennsylvania Wharton School, University of York in the United Kingdom, and Edinburgh University in Scotland, among others).

Dr. Mun is also currently a finance and economics professor and has taught courses in financial management, investments, real options, economics, and statistics at the undergraduate and the graduate M.B.A. levels. He is teaching and has taught at universities all over the world, from the U.S. Naval Postgraduate School (Monterey, California) and University of Applied Sciences (Switzerland and Germany) as full professor, to Golden Gate University (California) and St. Mary's College (California), and has chaired many graduate research thesis committees. He also teaches risk analysis, real options analysis, and risk analysis for managers' public courses where participants can obtain the Certified in Risk Management (CRM) designation upon completion of the week-long program. He also holds the position of the EU President of the American Academy of Financial Management and sits on the Global Board of Standards at the AAFM. He was formerly the Vice President of Analytics at Decisioneering, Inc. where he headed up the development of options and financial analytics software products, analytical consulting, training, and technical support, and where he was the creator of the Real Options Analysis Toolkit software, the older predecessor of the Real Options Super Lattice software. Prior to joining Decisioneering, he was a Consulting Manager and Financial Economist in the Valuation Services and Global Financial Services practice of KPMG Consulting and a Manager with the Economic Consulting Services practice at KPMG LLP. He has extensive experience in econometric modeling, financial analysis, real options, economic analysis, and statistics. During his tenure at Real Options Valuation, Inc.,

Decisioneering, and at KPMG Consulting, he had taught and consulted on a variety of real options, risk analysis, financial forecasting, project management, and financial valuation issues for over 100 multinational firms (former and current clients include 3M, Airbus, Boeing, BP, Chevron Texaco, Financial Accounting Standards Board, Fujitsu, GE, Microsoft, Motorola, Pfizer, State of California, Timken, U.S. Department of Defense, U.S. Navy, Veritas, and many others). His experience prior to joining KPMG included being Department Head of financial planning and analysis at Viking Inc. of FedEx, performing financial forecasting, economic analysis, and market research. Prior to that, he did financial planning and freelance financial consulting work.

Dr. Mun received his Ph.D. in Finance and Economics from Lehigh University, where his research and academic interests were in the areas of Investment Finance, Econometric Modeling, Financial Options, Corporate Finance, and Microeconomic Theory. He also has an M.B.A. in business administration, an M.S. in management science, and a B.S. in Biology and Physics. He is Certified in Financial Risk Management (FRM), Certified in Financial Consulting (CFC), and is Certified in Risk Management (CRM). He is a member of the American Mensa, Phi Beta Kappa Honor Society, and Golden Key Honor Society as well as several other professional organizations, including the Eastern and Southern Finance Associations, American Economic Association, and Global Association of Risk Professionals. Finally, he has written many academic articles published in the *Journal of the Advances in Quantitative Accounting and Finance*, the *Global Finance Journal*, the *International Financial Review*, the *Journal of Financial Analysis*, the *Journal of Applied Financial Economics*, the *Journal of International Financial Markets, Institutions and Money*, the *Financial Engineering News*, and the *Journal of the Society of Petroleum Engineers.*