An Exploratory Assessment of the Trucking Industry for Transporting California Produce

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Introduction

There is a growing concern from industry stakeholders about the availability and cost of transporting perishable fruits and vegetables. Even during the recent recession as the national unemployment rate reached record levels, agriculture producers have voiced concerns over a shortage of drivers. Couple this concern with rising fuel prices and a tough California regulatory environment, and there is little doubt that the cost of transporting fresh produce will continue to increase for the foreseeable future.

At first glance, agricultural transportation appears to be a small portion of the food dollar. Canning (2011) has estimated that the consumer spends approximately $0.035 of their food dollar on transportation. While it appears that transportation is not a significant factor where the consumer's food dollar is spent, transportation costs are not uniformly distributed across different agricultural products. For instance, the per pound transportation cost for rice normalized by the price of rice is lower than the transportation cost for a pound of strawberries normalized by its price, for the same distances traveled. This is primarily due to the differences in required modes of transportation resulting in the potential for transportation costs to play a large role in the competitiveness of a product, especially fresh perishable produce.

California is one of the largest producers of fresh fruits and vegetables in the nation. In 2014 alone, producers in the state harvested 47% of the US harvested acres of vegetables which accounted for 52% of US production (CDFA, 2015). California is the only real domestic producer for some crops (e.g., artichokes, olives, and kiwifruit), while it has several major competitors for other crops (e.g., apples, sweet cherries, and pears). For those commodities with high transportation costs relative to its competitors, these costs may play a large role in the ability to sell at competitive prices. If issues affecting the availability and cost of transportation services continue to intensify, California producers may find themselves at a severe disadvantage on both the national and international stage. Unfortunately, there is little current information about the major issues that are affecting the transportation of California produce.

There have been a handful of studies, now mostly outdated, that examine how transportation affects the movement of agricultural commodities (Woods, Saghaian, and Ona, 2009; Roehner, 1996; Beilock, Dunton, and Kepler, 1992; Beilock and Stegelin, 1982). Even though the transportation industry plays a large role in facilitating the supply of California produce, there have been few studies that attempt to understand the perspectives of the individuals directly involved in the market. Outside of standard trend reports published by the Transportation Service Division of USDA-AMS such as the Agricultural Refrigerated Truck Quarterly (USDA, 2012), and the Agricultural and Food Transporters Conference, there have only been a handful of studies focused solely on the impact that truck transportation has on agriculture (e.g., AMS, 2010; McGregor and Casavant, 2010; Durham, Sexton, and Song, 1996). Indeed, the most recent survey of agriculture transportation participants was conducted by Hagen et al. in 1999.

In order to better understand how current transportation issues affect the California agricultural industry and its competitiveness, a survey was conducted that elicited responses from truckers/carriers who haul California fresh produce. These perspectives shed light on the

underlying factors that are driving the availability and cost of transportation services. With extensive coordination from industry leaders the survey was created and disseminated to a representative group of truckers/carriers operating in California. With a better understanding of these factors both industry players and policy makers should be able to better manage the complex dynamics of the fresh produce supply chain in California.

There are two primary objectives of this research. First, it provides an overview of the trucking environment in California for fresh fruits and vegetables. Second, it identifies the major issues that affect the transportation of California produce from the trucker's perspective. The paper is unique because it provides these issues from the vantage point of truckers with a focus on fresh fruits and vegetables from California.

Trucker Survey

The survey was developed utilizing a previous survey conducted by Hagen et al. (1999). While many questions from these survey instruments overlap, a set of new questions were incorporated relating to the current economic and transportation environment. To obtain the sample, a branch of the American Truckers Association known as the Agricultural and Food Transporters Conference provided assistance. This group represents trucker/carriers on issues that affect the transportation of agricultural commodities. This group represents approximately 450 truckers/carriers nationally. The distribution of the survey was coordinated by a representative of this organization who forwarded it to a set of truckers who haul California produce.

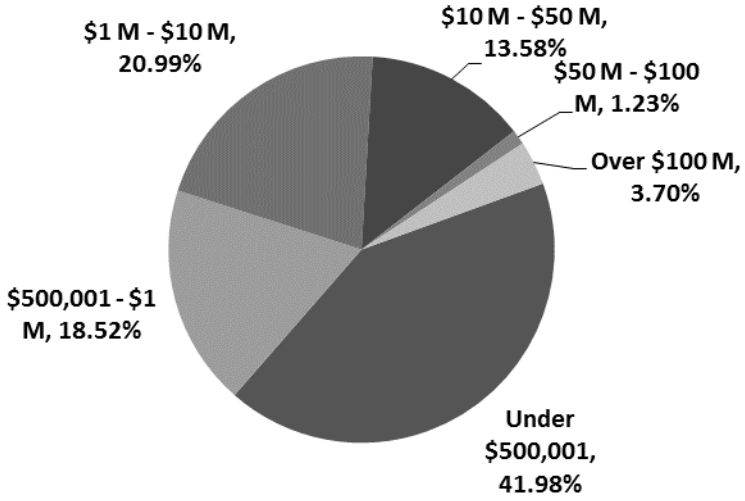
The survey of truckers and carriers had five major categories: a) general demographic information, b) operational time frames, c) issues concerning capital investment, labor availability, and the use of lumpers, d) issues of importance to the truckers/carriers and their level of satisfaction regarding these issues, and e) how they might change their pricing strategies given permanent changes in a set of selected factors.

Trucker and Carrier's Perspectives and Concerns

There were 86 truckers/carriers who responded to the request to take the survey out of the 450 who were sent access to the survey instrument. The respondents represented trucking companies who have headquarters in 32 different states where 13% of the respondents have headquarters in California. The majority of respondents reported having fewer than 25 drivers employed in their firm indicating that the industry is comprised of many small operations with a few large companies. Furthermore, 49% of respondents have fewer than 5 trucks in their fleet. Sixty percent of the firms earned less than $1 million in revenue for 2009, while nearly 19% earned over $10 million, Figure 1. The average percentage of truckloads containing California produce was 43%.

Firms indicated that the average age of trucks in their fleet was 4.86 years, with the average age of trailers being 5.59 years. Given that refrigerated trucks can last 10 to 12 years, the fleet appears to be mid-life. Approximately 55% of respondents indicated that they experienced difficulty obtaining capital in the first three years of the recession for expanding/maintaining their fleet. Typically, the smaller trucking firms indicated a greater degree of difficulty in obtaining capital.

Figure 1: Distribution of Respondents by Gross Revenue



The trucking industry is heavily reliant on qualified individuals to drive trucks as an occupation. Firms in the survey indicated that the average age of their drivers was 44.65 years old. For 59% of the companies, this average age has increased over the last five years. A typical driver will work for a particular trucking company for an average of 8.43 years. Forty-three percent of the trucking firms reported having difficulty finding drivers for expanding/maintaining their fleet. Of this group, nearly 96% believed that this difficulty has hindered the maintenance/expansion of their fleet.

Table 1: Loading and Unloading Time by Type of Load

Load Type	Segment Of Transit	Average Hours	Percentage of Total Time	Median Hours	Percentage of Total Time
Full Load	Wait Time Before Loading	6.85	42.23%	4.00	44.44%
	Load Time	3.46	21.33%	2.00	22.22%
	Wait Time for Unloading	3.03	18.68%	1.00	11.11%
	Time to Unload	2.88	17.76%	2.00	22.22%
	Total	16.22	100.00%	9.00	100.00%
Mixed Load	Wait Time Before Loading	9.30	40.61%	6.00	44.44%
	Load Time	7.15	31.22%	4.50	33.33%
	Wait Time for Unloading	3.29	14.37%	1.00	7.41%
	Time to Unload	3.16	13.80%	2.00	14.81%
	Total	22.9	100.00%	13.50	100.00%
Partial Load	Wait Time Before Loading	5.64	37.93%	3.00	37.50%
	Load Time	4.45	29.93%	2.00	25.00%
	Wait Time for Unloading	2.64	17.75%	1.00	12.50%
	Time to Unload	2.14	14.39%	2.00	25.00%
	Total	14.87	100.00%	8.00	100.00%

One of the major factors affecting truckers was transit time for shipping produce. Transit time can be categorized into driving time, wait time before loading, load time, wait time for unloading, and unloading time. Respondents reported that the average length of a full load in miles was 1,961. Given an average day's driving distance for a ten-hour day and average industry operational speed of 39.98 miles per hour, the average reported length of a full load haul would take 5 full days of drive time (Trego and Murray, 2010).

In order to handle long wait times, trucking companies are hiring lumpers, individuals who load and unload freight. Approximately 83% of the truckers have used lumpers to unload their trucks. Sixty-nine percent believed that lumpers decreased the unloading time. Over 97% of the truckers who used lumpers indicated that they were charged by the load rather than per hour where the average cost per load was $160.

A select list of issues of importance can be found in Table 2 along with a distribution of responses that range from "Not Important" to "Very Important". The most important issue for the truckers was waiting time for loading their trailers. Over 92% of the respondents indicated this as a very important issue. This result compared with wait times for loading found in Table 1 above strongly suggests that produce shippers should examine carefully the issue of wait time for loading. The second highest important issues for truckers are attitude of dock personnel and perishability of load.

Table 2: Truckers' Issues of Importance

Issue of Importance	Not Important		Somewhat Important		Very Important
Wait time for loading	0.00%	0.00%	1.85%	5.56%	92.59%
Attitude of dock personnel	3.70%	0.00%	7.41%	14.81%	74.07%
Perishability of load	3.70%	0.00%	7.41%	14.81%	74.07%
Attitude of shippers	1.85%	0.00%	7.41%	18.52%	72.22%
Ability to load/unload easily	1.85%	0.00%	14.81%	14.81%	68.52%
Parking	0.00%	1.85%	16.67%	12.96%	68.52%
Attitude of receiver	1.85%	3.70%	9.26%	22.22%	62.96%
Wait time for unloading	3.77%	1.89%	15.09%	11.32%	67.92%
Availability of backload with current trailer	1.89%	5.66%	11.32%	16.98%	64.15%
Risk of shipment	1.85%	1.85%	20.37%	14.81%	61.11%
Value of load	5.66%	1.89%	13.21%	20.75%	58.49%
Attitude of other employees	1.85%	3.70%	20.37%	24.07%	50.00%
Attitude of dispatcher (carrier)	5.56%	3.70%	20.37%	14.81%	55.56%
Clear loading/unloading area	3.70%	3.70%	22.22%	24.07%	46.30%
Roadside regulation monitoring	7.55%	5.66%	20.75%	16.98%	49.06%
Attitude of other drivers	9.26%	9.26%	24.07%	22.22%	35.19%

Trucking routes are important to the efficiency of truckers delivering their loads. With agriculture occurring typically in rural places in a state, it would be expected that truckers would not have to deal with handling traffic congestion. California has many routes that cross and exit the state. Survey respondents were asked to identify the percent of the time they experience congestion on California's major transportation routes as well as the typical delay time. Table 3 provides the results of these two questions. Interstate 5 had the highest average percentage of congestion at 35% with an average delay of 3.21 hours. This route runs from the southern portion of the state, through the Central Valley of California up to Washington State. Interstate 15 had the longest delay time at 4.63 hours. This route runs through the southern portion of the state and travels across the country along the southern Border States.

Table 3: Congestion and Typical Delay Times on Major California Routes

Major Routes	Percentage of Time Congested	Typical Delay in Hours Due to Congestion
I-5	35.03%	3.21
I-80	31.62%	4.36
I-10	27.78%	2.21
I-15	27.32%	4.63
I-40	26.06%	2.17
Port of LA/Long Beach	18.70%	1.82
Port of Oakland	16.14%	1.71
Other	14.05%	1.26
I-8	6.96%	0.76

There are many possible factors that affect the price charged by trucker/carriers. Table 4 identifies a subset of factors that affect transportation costs related to California. For each factor presented, the survey inquired what percentage change in charges of service would occur if there was a permanent change in the factor. The two factors that garnered the highest percentage increase were regulatory based.

Table 4: Expected Change in Transit Prices Due to a Permanent Change in Selected Factors

Factor Affecting Transportation Costs	Percentage Change in Charges for Services
The New CARB Regulations	28.92%
The CSA 2010 Legislation	19.14%
10% Increase in Fuel Price	17.46%
10% Increase in Road Congestion	14.61%
10% Increase in Truck Maintenance Costs	12.44%
10% Increase in Trailer Maintenance Costs	12.38%
10% Decrease in Driver Availability	11.77%
10% Increase in Taxes	11.76%
10% Increase in Produce Shipping Insurance Costs	11.06%
10% Increase in Roadside Equipment Inspections	10.81%
10% Decrease in Rail Transportation Prices	10.14%
10% Decrease in Intermodal Transportation Prices	9.96%
10% Decrease in Airline Transportation Prices	9.22%

The truckers in the survey indicated that if the new California Air Resource Board (CARB) regulations were permanent, then they would expect to increase what they charge for shipment by at least 28%. The U.S. Department of Transportation's Compliance, Safety and Accountability (CSA) 2010 initiative would potentially cause a 19% increase in price of services charged. The next two highest impacting factors were a 10% permanent increase in fuel prices and a 10% increase in road congestion.

Summary of Key Findings

The survey points to a few general factors that are the main causes for the increasing concern about the availability and cost of transporting fresh produce. The truckers indicated that they spent a large amount of time waiting to load produce at the shipper's facility. The issue of wait-time is highest on the list truckers find most important and it is an issue that truckers believe the shippers have a high level of poor performance. They indicated that this wait time seems to be worse for produce than it is for other goods they haul.

In addition, many truckers in the state indicated they face major time delays due to congestion. Truckers who use Route I-5 and I-80 encounter congestion at least 30% of the time, which can lead to major delays in shipments. The typical delay that occurs on these routes when congestion is encountered is over 3 hours. In order to deal with congestion issues, a large majority of truckers indicated that they schedule pick-ups and deliveries either at night or on off-peak congestion hours. These findings beg two interesting questions. First, is the wait time so long because truckers who are trying to avoid congestion are scheduling when shippers are not prepared to ship? Or is it that since everyone is attempting to avoid congestion, shippers have become inundated with trucks that they cannot handle because they do not have the infrastructure?

Regardless of the cause of this effect, truckers are now seeing a de facto decrease in their hourly wages. Since trucker/carriers are generally paid by the mile, time spent waiting to load or in congestion is time not spent on the road. This in turn decreases the number of miles they are able to drive in a given time period which decreases their ability to generate income. If this environment continues to persist drivers will pursue careers with a more stable income.

The issues of concern regarding wait time and access to drivers did not test significantly different across firm revenue suggesting that smaller firms will feel a larger marginal impact. It is feasible to anticipate in the near future consolidation of smaller firms and changes in trucker pay structures to those more conducive of stable wages such as salaried drivers.

The regulatory environment in California is also a major concern for truckers. If the regulatory environment continues on its current course, shippers should expect the price of shipping to increase over the next five to ten years. This is problematic for shippers because they are already concerned about the current cost of shipping their produce and trucker/carriers see this cost eating into already dwindling profit margins.

Looking Forward

With the average US price of diesel dipping below the $2.00 mark in February 2016, the impact of transportation costs on fresh produce has moved to the back burner in most people's minds. This has done nothing, however, to alleviate any of the major concerns illustrated above. Policy makers and produce companies alike should be exploring areas of efficiency improvements. For

instance, electronic logging devices look to be the reality of the future, certainly in California. Why not capitalize on the up-to-date delivery of information and make real-time scheduling of delivery/pickup? This would effectively increase driver salaries and decrease time in transit. It seems that public investment in dedicated transportation infrastructure may be the key area that policy can possibly make significant improvements to transportation efficiency of fresh produce.

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