DISTANCE MATTERS: TRUCK MILES USED FOR AGGREGATE HAULING ARE DIRECTLY RELATED TO PRODUCTION LOCATION

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Executive Summary

Delivered aggregate cost is a function of the production price plus a variable cost proportional to transportation distance. The addition of a new production site alone may not result in reduced aggregate hauling distance. The location of a new production site in relation to existing production sites will influence any environmental impact analysis of the new quarry, since the new quarry alone may not result in reduced aggregate hauling truck miles. The specific location of the proposed Oster/Las Pilitas Quarry would result in increased truck miles used for aggregate hauling in relation to existing production sites within the La Panza Granitics region for most customers. Diversion of aggregate consumption from existing production sites to the proposed Oster/Las Pilitas Quarry would result in no savings per ton for customers south and north of the quarry, respectively. The proposed project site would offer no reduction, but an average increase of vehicle miles traveled per load, and as a result, no reduction in air emissions from trucking activity or overall cost of delivered aggregate would be realized.

Introduction

When evaluating the addition or subtraction of truck traffic associated with a new quarry, the economics of location and the quantity of used aggregates as a function of price, must be understood (Berek, 2005). The addition of a new quarry project will not significantly increase the quantity of aggregates used (i.e., demand) (Berek, 2005).

Transportation is a significant component in the price of delivered aggregate. It has been projected that shipping costs for aggregates can outweigh production costs if the material is transported more than 20 miles (Dunphy, 2006).

Problem Definition

Transportation costs, which are a function of delivery distance, are a major contribution to the cost of delivered aggregate. The influence of transportation costs is illustrated in Figures 1-3. Circles represent aggregate using projects of equal size. The scale is in miles with projects shown at locations marked -1, 0, 1, 2, and 3. For simplicity, each project uses one unit of aggregate. Location A at mile 0 is an existing aggregate production site.

With only one aggregate production site (A) at mile 0, seven miles are traveled to supply five projects: zero miles for project at mile 0, one mile for each for the projects at mile -1 and 1, two miles for the project at 2 and three miles for the project at 3 (Figure 1).

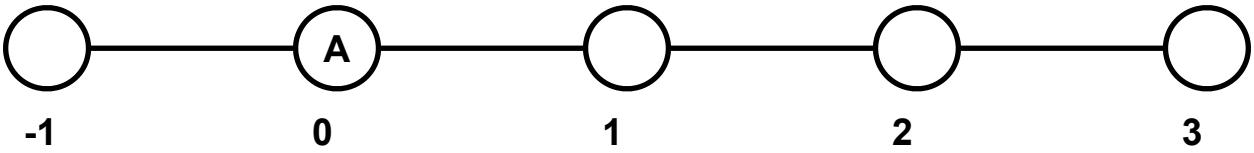

Figure 1. Diagrammatic representation of aggregate transportation distance from single production site (A) to supply five projects (circles). Numerical scale indicated in miles (Adapted from Bereck, 2005).

The influence of adding one or more aggregate production sites is illustrated in Figure 2. If an additional aggregate production site is started at B, the miles traveled decreases to six, as there is no transportation required for the aggregate-using project at B and all other projects are served by the original site (A). However, if a new site is established at C instead of being placed at B, transport distance falls to three miles because two projects have aggregate production on-site and therefore zero transportation requirements, and the three remaining sites each require a one-mile transport.

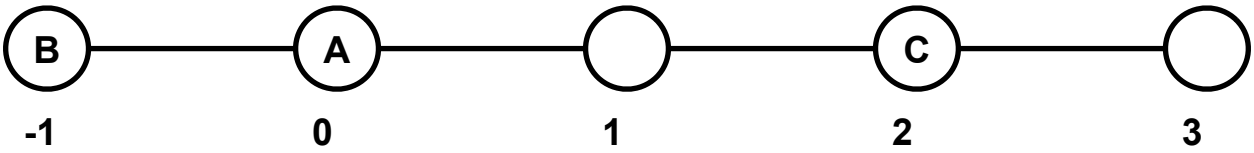

Figure 2. Diagrammatic representation of aggregate transportation distance from two production sites (A and, B or C) to supply five projects (circles). Numerical scale indicated in miles (Adapted from Berek, 2005).

Since aggregate cost depends on distance and, markets minimize costs, the free market system will always choose a point with the lowest cost (i.e., distance) (Bereck, 2005).

The influence of adding a new aggregate production site that is comparable in distance to an existing site is illustrated in Figure 3. If an additional aggregate production site is started at B, there is no change in the miles traveled, as the distance between production sites A and B to aggregate using projects is comparable. However, if aggregate use at location 3 is diverted from the existing production site C to the newly established site B, transport distance increases from one to three miles.

The one-way distance from common northbound and southbound access points to scale house of the two existing (Hanson, Rocky Canyon) and one proposed (Oster/Las Pilitas) aggregate extraction and processing sites within the La Panza Granitics region were calculated using Google Maps application (Table 1) (Google, 2014). These distances were later verified by driving the actual route and confirming by odometer readings.

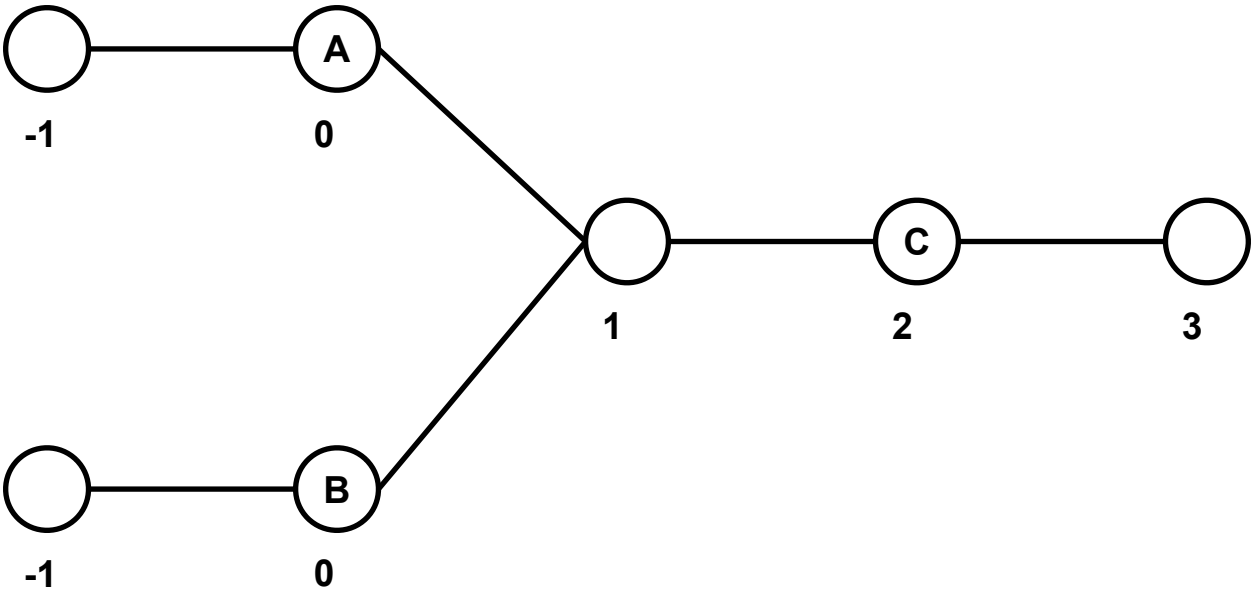

Figure 3. Diagrammatic representation of aggregate transportation distance from two production sites (A and, B or C) to supply five projects (circles). Numerical scale indicated in miles (Adapted from Bereck, 2005).

Table 1. One-way distance (miles) for outgoing northbound and southbound truck traffic from existing and proposed aggregate extraction and processing sites within the La Panza Granitics region to arterial access points[1].

Incoming Direction	From	To	Distance, miles
Southbound	Hanson	US-101 & CA-58	5.1
Southbound	Oster/Las Pilitas	US-101 & CA-58	5.2
Southbound	Rocky Canyon	US-101 & CA-58[2]	7.5
Northbound	Hanson	US-101 & Santa Barbara[3]	5.0
Northbound	Oster/Las Pilitas	US-101 & Santa Barbara[3]	8.9
Northbound	Oster/Las Pilitas	US-101 & Santa Barbara[4]	10.0
Northbound	Rocky Canyon	US-101 & Santa Barbara	2.7

[1]Distance measured from stated location to existing or proposed scale house location of the respective destination using Google Maps application and verified by driving actual route.
[2]Routed via Santa Barbara Road to US-101 South
[3]Routed via El Camino Real North to Santa Barbara Road
[4]Routed via CA-58 West to US-101 North

Using actual distance shown in Table 1, the resulting difference in both north- and southbound aggregate related truck traffic distance was calculated between each of the existing (Hanson, Rocky Canyon) and the proposed (Oster/Las Pilitas) aggregate extraction and processing sites within the La Panza Granitics region (Table 2). Outgoing southbound trips diverted from the competing Hanson Quarry to the Oster/Las Pilitas Quarry would travel an additional 0.1 miles to the arterial access. Northbound truck

traffic diverted from the Rocky Canyon to the Oster/Las Pilitas Quarry would travel an increased distance of at least 6.2 additional miles (one-way).

Table 2. One-way distance differential (miles, %) resulting from diverting outbound truck traffic from existing (Hanson, Rocky Canyon) to the proposed Oster/Las Pilitas quarry.

Direction	Original Site	Distance Differential, miles	Distance Differential, %
Southbound[1]	Hanson	0.1	2.0 ↑
Southbound[1]	Rocky Canyon	-2.3	30.7 ↓
Northbound[2]	Hanson	3.9	78.0 ↑
Northbound[2]	Rocky Canyon	6.2	266.7 ↑

[1]Outbound traffic routed from Oster/Las Pilitas via CA-58 West to US-101 South.

[2]Outbound traffic routed from Oster/Las Pilitas via El Camino Real North and Santa Barbara Road to US-101 North.

Reduced truck trip distance length is not credited to this project (San Luis Obispo, 2014). A new aggregate extraction and processing site at the proposed Oster/Las Pilitas location would increase travel distances. The proposed project is inconsistent with Policy 2 “Reduce and minimize the generation of air pollutants and greenhouse gases from existing and future development, with emphasis on reducing vehicle miles traveled” of The County of San Luis Obispo General Plan Circulation Element objectives and policies and the “potentially consistent” determination (San Luis Obispo County, 2013; 2014) cannot be maintained.

Business Impacts

Transporting from shorter distances saves money. The cost of trucking aggregates increases $0.15 per ton for every mile hauled (CALCIMA, 2014). For a typical tandem truck carrying 25.5 tons (18 cu yd) of aggregate each additional mile of distance would result in $3.83 added cost (Central Mass Sand & Gravel, 2014).

Ninety percent (90%) of Oster/Las Pilitas quarry truck traffic is conservatively projected to be routed through the intersection of El Camino Real and Estrada via CA-58 (San Luis Obispo County, 2014). Using data presented in Table 2, diverting business both north and south of Santa Margarita from the existing production sites within the La Panza Granitics would cause an additional 3.95 miles to be traveled per load resulting in a $0.27 average increase in aggregate cost per ton.

Table 3. One-way distance (miles) resulting cost ($ per ton) from diverting outbound truck traffic from existing, original (Hanson, Rocky Canyon) site to the proposed Oster/Las Pilitas quarry.

Direction	Original Site	Distance Differential, miles	Cost Differential, $[1]
Southbound	Hanson	0.1	0.02
Southbound	Rocky Canyon	-2.3	-0.35
Northbound[2]	Hanson	3.9	0.59
Northbound[2]	Rocky Canyon	6.2	0.93

[1]Aggregate costs increase $0.15 per ton for every mile hauled (CALCIMA, 2014).
[2]Outbound traffic routed from Oster/Las Pilitas via El Camino Real North and Santa Barbara Road to US-101 North.

Summary

The specific location of a new quarry project, and the relative distances to transportation corridors, influences vehicle miles traveled, not just the addition of a project alone.

The location of the proposed Oster/Las Pilitas project is essentially the same distance (+2%) from the Hwy 101/58 and 4-5 miles further away (nearly 100% increase depending on route chosen/101 or El Camino Real) from the Hwy 101/Santa Barbara Road onramp than the existing Hanson Santa Margarita Quarry is.

The location of the proposed Oster/Las Pilitas proposal would result in a significant (6.2 - 7.8 mile or 267%) increase in travel distance for every northbound load diverted from Rocky Canyon Quarry.

The proposed Oster/Las Pilitas quarry would not decrease travel distances as compared to existing production facilities extracting from the same deposit, but would more likely increase overall vehicle miles traveled, increase air emissions and increase average aggregate costs from the specific location proposed.

The proposed project is inconsistent with Policy 2; “Reduce and minimize the generation of air pollutants and greenhouse gases from existing and future development, with emphasis on reducing vehicle miles traveled” of The County of San Luis Obispo General Plan Circulation Element Objectives and Policies and the “potentially consistent” determination (San Luis Obispo County, 2013; 2014) cannot be maintained.

Finally, regarding the applicant’s claim that the Oster/Las Pilitas proposal may more efficiently supply aggregate for chip seal specifications and offset the small amount reported to currently be being imported from outside the county; This material not only can be produced at the two already existing quarries in the La Panza Granitic Area but will be when and if economic incentive and market demand support such production. It’s also questionable whether or not specifications could be met without washing aggregate, something Las Pilitas Resources claims it will not be doing.

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Appendix

Table A1. Locations and coordinates used for calculating distances described in text.

US-101 & CA-58	35.382775	-120.630418
US-101 & Santa Barbara Road	35.443537	-120.638278
Oster/Las Pilitas Quarry	35.413664	-120.565412
Hanson/Santa Margarita Quarry	35.417525	-120.576068
Cal Portland/Rocky Canyon Quarry	35.471528	-120.612662