

# Construction Aggregate Supply Limitations

## Estimates of Economic Impact

- Since transportation is a major element in the cost of delivered aggregate, and the cost depends on the distance of the delivery, permitting new aggregate sites would lead to shorter haul distance to minimize transport/shipping cost. According to the industry, shipping costs for aggregates can outweigh production costs if the material is trucked more than 20 miles.<sup>1</sup>
- A recent UC Berkeley study<sup>2</sup> confirms that the most likely, and dominant, effect of the opening of new sites for the production of construction aggregates would be *a reduction in truck miles of travel for hauling aggregates* (i.e., new quarry will be located closer to the users to minimize transportation costs), *thus a reduction in emissions from trucks*.
- According to the California Geological Survey (CGS), California has an estimated **74 billion tons** of aggregate resources underlying mineral lands classified by the State Geologist. However, only about **5.3 billion tons** of aggregate (7.2 percent) have actually been permitted by cities and counties for mining activities. Permitting of mining sites takes between five and ten years. At the current rate of production of 177 million tons per year, the permitted reserves will be exhausted in about 30 years.
- According to the CGS, the state produced 176.4 million tons of construction sand and gravel in 2005, valued at \$1,269 million. The production of crushed stone in 2005 was estimated at *58.87 million tons*, valued at \$361.5 million. According to the same source, California imported about 2.4 million tons of sand and gravel during 2005 from Canada and Mexico, a fairly small portion of the total use.
- The total aggregate production (or demand) in 2005, therefore, exceeded **235.3 million tons** (176.4 + 58.87). This production level would *generate about 9.4 million truckloads* (@ 25 tons per truck), or a total of **18.8 million truck trips** a year (including empty trucks returning to the aggregate sites) related to the transportation of construction aggregate in the state.
- According to the Teichert Construction and West Coast Aggregates, Inc. the average hauling distance for aggregates in California may be as high as 50 miles. Truck transportation accounts for about 99 percent of shipping aggregates for 40 miles or less.<sup>3</sup> At an average 50-mile distance, the total aggregate-truck VMT would be **940 million miles** per year (18.8 million trucks x 50 miles). This would account for 4% of total truck trips, or 6% of all truck miles of travel on the state highways.
- Let us assume that additional aggregate production resulting from permitting additional mining facilities would reduce the average hauling distance from 50 to 35 miles statewide. Using an average hauling distance of 35 miles, the total annual aggregate-truck miles of travel would be **658 million miles** (18.8 million trucks X 35 miles). The 15-mile shorter hauling distance would reduce aggregate-truck miles of travel by **282 million miles per year** (940 - 658), and annual diesel fuel consumption by **44 million gallons** (using CARB diesel fuel consumption rate of 0.153 gallons per vehicle-mile at 55-60 mph speed).

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<sup>1</sup> Therese Dunphy, "Evening the Playing Field," *Aggregates Manager*, August 2006.

<sup>2</sup> Peter Berck, "A Note on the Environmental Costs of Aggregates," *Working Paper No. 994*, Dept. of Agricultural and Resource Economics and Policy, University of California, Berkeley, January 2005.

<sup>3</sup> Tina Grady Barbaccia, "Off-highway Transportation," *Aggregates Manager*, July 2006.

- Based on the California Air Resources Board emission factors estimates, and assuming an average 55-60 miles per hour speed, a reduction of 282 million miles of truck travel (or 44 million gallons of diesel fuel consumption) would reduce truck emissions (CO, NOx, PM10, SOx, VOC) by about **835.4 tons a year**.
- The total transportation cost of aggregates (at \$.10 per ton per mile) shipped 35-miles average distance throughout California would be \$1.6 billion (18.8 mil trucks x 25 tons x 35 miles x \$.10), and over \$2.3 billion if shipped an average 50 miles. The statewide transportation cost savings of reduced hauling distance would amount to **\$705 million a year** (or a 43% cost savings).
- The California Department of Transportation estimates that on average, about \$2.55 billion is spent on state and local capital outlay projects each year, and on average, aggregates account for **8-10%** of total project costs, or **\$250 million** annually. A 43% increase/decrease in shipping cost of aggregates would increase/decrease the total annual project costs by **\$108 million per year**.
- The reduction in aggregate-related truck miles of travel would also reduce traffic congestion and traffic accidents on roads, but these impacts would be difficult to estimate. An additional benefit from truck trip reduction would be reduced pavement deterioration. The Department of Transportation on average spends about \$500 million annually on pavement rehabilitation projects. Assuming trucks account for 60% of the pavement damage on the state highways, and aggregate-trucks account for 4%-6% of all truck travel on the state highways (depending on the average distance of 35 or 50 miles), the trucks shipping aggregates would account for about **\$12-18 million** of potential savings in the cost of pavement rehabilitation each year.
- Project delays due to lack of aggregate supply in the area, would also result in project cost escalation and reduced user benefits (reduced travel time and accidents) that would have otherwise been generated. A delay of 10% of the projects (or \$255 million in capital outlay expenditures) for one year would increase the cost of the state and local capital outlay program by **\$9 million a year** (at 3.5% average cost escalation factor). It should be noted that the highway construction cost index in recent years has grown at much higher rates than the historical average of 3.5%. Therefore, the project cost escalation due to lack of aggregate supply and project delays could potentially be much higher than the figure above.
- Generalizing, and pro rating, the user benefits estimated for the 2006 Interregional Transportation Improvement Program (ITIP) projects, a delay of 10% of the capital outlay program for one year would also cost California about **\$97 million** in increased roadway congestion and traffic accidents.

In conclusion, permitting and expansion of additional construction aggregate supply sources in California suggests potentially significant benefits and cost savings that would provide a high payoff and worthwhile effort for the state to undertake. Again, those benefits include:

- A reduction in emissions from trucks with the reduction in truck miles of travel for hauling aggregates
- Shorter hauling distance reducing aggregate-truck miles of travel and the cost of the materials
- Reduction of pavement deterioration from fewer truck miles traveled
- Reduction in project delays due to lack of aggregate supply in the area, which leads to increased project costs
- Reduction in aggregate-related truck miles of travel would also reduce traffic congestion and potentially reduce traffic accidents on roads