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The Economic Impact of the New York State Mining and Construction Materials Industry

October, 2011

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SUMMARY

The mining industry in New York State is large and diverse, encompassing commodities such as bluestone, clay, dolostone, garnet, granite, industrial sand, limestone, peat, salt, shale, sandstone, talc, trap rock, wollastonite, zinc, sand and gravel, gypsum, glacial till, marble, marl and topsoil. Highway construction, new housing construction, ice control, and landscaping are among the wide variety of projects that use these materials.

The majority of mining is New York is for construction materials that are used to build and maintain the State's infrastructure. Thus, in addition to the products listed above, three other critical project resources include hot mixed asphalt (HMA), ready mix concrete (RMC) and cement. Together with crushed stone of all types and sand & gravel, these materials drive the New York State mining and construction materials industry (MCMI).

The Center for Governmental Research (CGR) performed an economic and fiscal impact study of the industry at the request of the NYS Geological Survey. To do so, CGR surveyed firms within the MCMI industry to obtain production, sales, employment and wage information. As discussed in greater detail below, survey respondents represented at least half of the permitted acreage. With such a firm foundation of actual responses, CGR is able to estimate the characteristics of the entire industry with confidence.

CGR reports economic impact in terms of jobs and wages generated by the industry, and takes into account both direct and spillover impacts. Fiscal impact is reported in terms of sales tax, personal income tax and corporate taxes paid to the state.

Economic and Fiscal Impact Findings

The results of the survey served as the foundation of our estimate of the industry's economic impact. CGR extrapolates sales, employment and payroll for mines, as well as for HMA, RMC and cement operations. While these assumptions, based on averages, are reasonable, CGR emphasizes that this is a diverse industry. The value of products and the

skill levels of workers vary significantly from product to product. Our survey data were not detailed enough to account for all of these various differences. The conclusions of the analysis should be treated as reasonable estimates, not as precise measurements.

CGR uses the IMPLAN input-output modeling system to provide labor income and employment impacts, both direct and spillover for the MCMI industry.* CGR calculates that in 2007:

- Total NYS sales of the MCMI totaled between $3.3 to $3.5 billion dollars.

Economic Impact of the MCMI			
	Direct	Spillover	Total
Labor Income (millions of dollars)			
High Estimate	$833.6	$482.4	**$1,316.0**
Low Estimate	$765.1	$442.8	**$1,207.9**
Jobs (thousands of jobs)			
High Estimate	17.5	12.9	**30.4**
Low Estimate	16.1	11.9	**28.0**

- The MCMI was responsible for generating $1.2 to $1.3 billion in wages and 28,000 to 30,000 jobs in New York State, both direct and spillover.

- The MCMI industry contributes to the fiscal health of the state and localities through sales tax, personal income tax, motor fuel tax, corporate franchise tax and Mined Land Reclamation Law fees. The total fiscal contribution of the industry is estimated at $87-101 million annually. There are additional taxes and fees paid by industry participants that we did not attempt to estimate.

* See methodology section for a description of IMPLAN. The direct economic impact consists of the actual expenditures of NYS MCMI—i.e., the industry is directly involved with the transaction. Spillover expenditures result from the subsequent spending of those who receive the direct expenditures.

By way of comparison, the wood product manufacturing sector is responsible for about $335 million in payroll and employs about 9,300. Primary metal manufacturing pays about $700 million to 12,000 workers, while the warehousing & storage sector pays its 20,000 employees about $800 million. The average direct payroll per worker used in the study was about $48,000. This is slightly higher than the median salary for NYS industry.

Fiscal Impact of the MCMI (millions of dollars)	Direct	Spillover	Total
NYS and Local Sales Tax			
High Estimate	$22.6	$13.1	**$35.7**
Low Estimate	$20.8	$12.0	**$32.8**
NYS Personal Income Tax			
High Estimate	$28.6	$13.3	**$41.9**
Low Estimate	$26.3	$6.5	**$32.8**
Corporate Tax*	$5.8	n/a	**$5.8**
*As reported by the NYS Department of Taxation & Finance - 2004- mining only			
Mined Land Reclamation Law (MLRL)	$2.9	n/a	**$2.9**
Motor Fuel Tax			
High Estimate	$14.8	n/a	**$14.8**
Low Estimate	$13.1	n/a	**$13.1**
Total Fiscal Impact			
High Estimate	$74.7	$26.4	**$101.1**
Low Estimate	$68.9	$18.5	**$87.4**

Illustration: Impact of Closing Mines on Construction Costs

Despite the fact that the mining and construction materials industry brings significant economic benefits to the state and localities, mining operations are not always welcomed by individual communities. Local governments often enact restrictive zoning that have the effect of excluding or severely limiting mining. As a consequence, new or expanded mines are difficult to permit yet existing mine reserves are being depleted at a faster rate than new reserves are being brought into production.

Much of the material mined is of relatively low value, yet is expensive to transport. Transportation costs, therefore, comprise a relatively large share of the cost of the delivered material. Closure of mines has the effect of increasing the final delivered cost as the material will necessarily be transported a greater distance.

To reflect this, CGR estimates the effect of reducing the number of mines in the state. This report illustrates the potential impact on transportation costs from the loss of mines with close proximity to construction sites. While the illustration does not begin to address the cost impact on all construction projects in NYS, it provides a starting point for consideration and discussion.

Our hypothetical scenario estimates that if the number of mines were reduced by one-half, transportation costs associated with NYS Thruway construction sites could rise as much as 59%, or $2.2 million, in one year.

These conclusions are applicable to the entire industry. Continued shrinkage of the industry will drive up the cost of new construction and highway reconstruction. Our data did not permit a more detailed analysis by region, but clearly the impact would be more pronounced downstate.

Annual Cost Implications of Increasing Transportation Distance

	Cost of Fuel per Gallon	All mines included	One-quarter mines taken away	One-half mines taken away
Average Distance from Exit to Nearest Mine (miles)	----	13.5	19.1	21.4
Cost of Transporting Aggregate for Thruway Projects (millions of dollars)	$2	$3.4	$4.8	$5.3
Cost of Transporting Aggregate for Thruway Projects (millions of dollars)	$3	$3.6	$5.1	$5.7
Cost of Transporting Aggregate for Thruway Projects (millions of dollars)	$4	$3.9	$5.5	$6.1
Percentage Change in Cost (from all mines included)			42%	59%

Acknowledgements

CGR would like to thank all the companies who took the time to respond to the survey or contacted us to let us know the survey was not applicable to them. William Kelly, NY State Geologist, Director, New York State Geological Survey/ New York State Museum and David Hamling, Executive Director and professional geologist, New York Construction Materials Association have been incredibly helpful. They gave generously of their time, providing background information about the industry, offering input on the survey design, helping to encourage firms to fill out the survey, providing names of sources for data and other questions, and commenting on the final report.

CGR received input and help from many people in the process of conducting this analysis, but would like to specifically thank Andrew Clemente, Bonded Concrete; Jim Cleason, Abram Cleason Company; Paul Griggs, Griggs-Lang Consulting Geologists; Dan Meehan, Hanson America; Bill Poole, Lafarge North America; and Rich Riccelli, Riccelli Trucking, for answering our questions about the industry. We also thank Bradley J. Field, Director, Division of Mineral Resources and Christopher McKelvey, Division of Mineral Resources, Bureau of Resource Management and Development, Resource Development Section, both from New York State Department of Environmental Conservation, for providing data on the mines and for answering other questions related to permitted mines. Finally, Christopher Waite from the New York State Thruway Authority provided data on the NYS Thruway's use of aggregate.

CGR is wholly responsible for the final assumptions used to develop these estimates, however.

Staff Team

Hung Dang, Kate McCloskey, Kirstin Pryor, and Katherine Corley all contributed to the project in various ways.

Our dedicated research assistants, Matt Rubenstein and Melanie Zilora, were enormously helpful. They contributed to data collection and data analysis in many ways and we are grateful for the many hours they devoted to the various tasks assigned.

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INTRODUCTION

The mining and construction materials industry (MCMI) in New York State makes an economic impact on the state's economy as great as 30,000 jobs, $1.3 billion in total payroll and about $100 million in public sector revenues. Total sales for the industry are between $3.3 billion and $3.5 billion. The Center for Governmental Research developed these estimates using a number of resources, including a survey of industry participants. Details of the approach used and assumptions applied follow.

The mining industry in New York State is large and diverse, encompassing commodities such as bluestone, clay, dolostone, garnet, granite, industrial sand, limestone, peat, salt, shale, sandstone, talc, trap rock, wollastonite, zinc, sand and gravel, gypsum, glacial till, marble, marl and topsoil. Highway construction, new housing construction, ice control, and landscaping are among the wide variety of projects that use these materials.

The majority of mining in New York provides construction materials that are used to build and maintain the State's infrastructure. Thus, in addition to the products listed above, three other critical project resources include hot mixed asphalt (HMA), ready mix concrete (RMC) and cement. Together with crushed stone of all types and sand & gravel, these materials drive the New York State mining and construction materials industry (MCMI).

Other economically-significant uses of the output of this industry are bridge construction, commercial and public construction projects, drainage control, parking and driveway paving.

CGR surveyed firms within the MCMI industry to obtain production, sales, employment and wage information. CGR then estimated MCMI's impact on the NYS economy as a whole, but does not provide estimates of the local impact on communities in which the mines are located. Both economic and fiscal impacts are estimated; CGR reports economic impact in terms of jobs and wages generated, and fiscal impact in terms of sales tax and income tax generated.

This report helps to shed further light on the very important role that the mining and construction materials industry plays in the state. In addition to the traditional economic impact study, CGR estimated the effect of reducing the number of mines in the state. If all communities were to adopt a "not in my backyard" mentality, the cost of construction would increase. This report illustrates the potential impact of the removal of mines from close proximity to construction sites. While the method used

does not begin to address the cost impact on all construction projects in NYS, it provides a starting point for consideration and discussion.

OUTLINE OF REPORT

CGR's findings are presented in five parts:

(1) *Survey Results:* CGR summarizes the results of a survey sent to 204 companies.

(2) *Extrapolation of Survey Data:* CGR uses the results of the survey to extrapolate information about the remaining operations in NYS in order to estimate the potential sales revenue in NYS for 2007.

(3) *Economic and Fiscal Impact Estimates:* CGR estimates the economic impact of the mining and construction materials industry using the IMPLAN input-output modeling system. In addition, CGR provides sales and personal income tax estimates for the labor income generated in the industry, fuel taxes, corporate taxes paid to NYS from the mining industry, and fees paid under the Mined Land Reclamation Law.

(4) *Impact of Reduced Number of Mines:* CGR considers the impact on costs of NYS Thruway capital and maintenance projects if some mines were to "disappear."

(5) *Methodology:* CGR describes the methodology used throughout the report to extrapolate data and provide estimates.

FINDINGS

Survey Results

The New York State Department of Labor provides data on wages and employment for the mining industry. However, the category "mining" does not include the construction materials included in MCMI. Thus, CGR determined that it was necessary to collect primary data on the industry through a survey of mine operators. A copy of the survey can be found in the appendix.

Of the 204 companies who received surveys, 91 of them completed the survey.* These 91 companies will be referred to as the survey

*The 204 companies were chosen to fairly represent the different types of minerals as well as both the small and large players in the industry. In addition, all companies attending the NY Construction Materials Association meeting in May 2008 were given an opportunity to participate.

respondents, and it is their responses which are discussed in this section. The survey responses pertaining to employment, sales and production provide an illustration of the industry-wide numbers, but not industry totals. The results of the survey indicate that the MCMI is a powerful force in the NYS economy, as illustrated in the following tables.

- The survey respondents alone account for 6,500 full time jobs in New York State and about $310 million in payroll.
- The survey respondents alone totaled $1.7 billion in product sales in 2007.

Characteristics of Survey Respondents	
Number of Firms	91
Full Time Employees	6,419
Part Time & Seasonal Employees	460
2007 Payroll ($million)	$310.4

Summary of Survey Respondents: Sales & Production					
	Mining	**HMA**	**RMC**	**Cement**	**Total**
Number of Permitted Mines/ Number of Plants	331	129	95	3	558
2007 Production (millions of tons, except RMC - millions of yards)	69	12.6	2.9	2.4	N/A
2007 Sales (millions of dollars)	$779.8	$450.5	$235.1	$254.1	$1,719.5

Extrapolation of Survey Data

The tables above do not represent the entire industry. As the following figures attest, this $1.7 billion represents only a small portion of the total sales and production of the industry. CGR used the following data to extrapolate the survey results for each segment of the industry, ultimately allowing sales estimates for the entire industry.

Mining Operations

The 91 firms from the survey represent 191 operational mines with sales of about $780 million. As CGR estimates total mining sales as between $1.4 billion and $1.6 billion, the survey captured about half of the industry.

Hot Mixed Asphalt

According to the Asphalt Institute, NYS produced a total of 19.5 million tons of HMA in 2006.* Thus, the survey respondents represent 64% of the estimated NYS HMA industry.

Ready Mixed Concrete

According to the National Ready Mixed Concrete Association, NYS produced 11.615 million cubic yards of RMC in 2007. The survey respondents account for approximately 25% of the total 2007 RMC production in NYS.

Cement

Similarly, the Northeast Cement Shipper's Association calculates that there were 3,748,916 tons of cement shipped within New York between 10/1/05 and 9/30/06.† The survey responses represent 63% of the cement shipped within NYS during that time period. Some of the cement shipped is imported from outside NYS, so 3.7 million tons is larger than the total produced in NYS. The analysis includes all three NYS cement producers.

Sales Estimates

As stated, the 2007 sales and production figures reported by survey respondents are only a portion of the more substantial sales and production totals for the industry as a whole. CGR has extrapolated the survey data to

Total Sales of Mining & Construction Materials Industry (millions of dollars)	
Mining	
High Estimate	$1,630
Low Estimate	$1,441
Hot Mixed Asphalt	$704
Ready Mix Concrete	$940
Cement	$254
TOTAL	
High Estimate	$3,528
Low Estimate	$3,339

* The statistic is calculated from the data on liquid asphalt by using a conversion factor that HMA is produced using 5% liquid asphalt.
† Latest data available

estimate the potential sales revenue generated by the MCMI industry. CGR estimates that in 2007 the MCMI generated between $3.3 billion and $3.5 billion in sales.*

Economic and Fiscal Impact Estimates

An economic impact study estimates the wages and jobs that an industry is responsible for generating as a result of its economic activity. Essentially, it answers the question, "How is the economy larger because of this industry's activity in the community?"

Economic impacts are measured in terms of two types of expenditures: direct and spillover. The **direct** economic impact consists of the actual expenditures of NYS MCMI, i.e., the industry is directly involved with the transaction. **Spillover** expenditures result from the subsequent spending of those who receive the direct expenditures. Thus, an employee of a sand and gravel mine is part of the direct employment impact. The employees of supplier firms or of retailers who receive the patronage of mine employees are considered part of the spillover employment impact.

Labor Income and Employment Impacts

CGR reports the economic impact in terms of labor income and employment, as the following table shows.

Economic Impact of the MCMI

	Direct	Spillover	Total
Labor Income (millions of dollars)			
High Estimate	$833.6	$482.4	**$1,316.0**
Low Estimate	$765.1	$442.8	**$1,207.9**
Jobs (thousands of jobs)			
High Estimate	17.5	12.9	**30.4**
Low Estimate	16.1	11.9	**28.0**

CGR estimates that the MCMI generated between $1.2 billion and $1.3 billion in wages and was responsible for 28,000 to 30,000 jobs throughout New York State in 2007.

By way of comparison, the wood product manufacturing sector is responsible for about $335 million in payroll and employs about 9,300.

* See methodology section for more details about the extrapolation procedure. The sales estimate assumes the survey respondents produce the same revenue per unit of product as those not responding to the survey.

Primary metal manufacturing pays about $700 million to 12,000 workers, while the warehousing and storage sector pays its 20,000 employees about $800 million. The average direct payroll per worker used in the study was about $48,000, slightly higher than the median salary for NYS industry .

Fiscal Impact

CGR provides a conservative estimate of the fiscal impact of the MCMI. Not all taxes and fees were included in these estimates. We include:

- Local and state sales tax, and personal income taxes paid by individuals employed by the industry (both direct and spillover);*
- Fuel taxes paid by industry participants;
- Fees paid according to the Mined Land Reclamation Law; and
- Corporate franchise taxes (we used the latest data available--2004—from the New York State Department of Taxation and Finance for C Corporation taxpayers in the mining industry).†

Fiscal Impact of the MCMI (millions of dollars)

	Direct	Spillover	Total
NYS and Local Sales Tax			
High Estimate	$22.6	$13.1	**$35.7**
Low Estimate	$20.8	$12.0	**$32.8**
NYS Personal Income Tax			
High Estimate	$28.6	$13.3	**$41.9**
Low Estimate	$26.3	$6.5	**$32.8**
Corporate Tax*	$5.8	n/a	**$5.8**
*As reported by the NYS Department of Taxation & Finance - 2004- mining only			
Mined Land Reclamation Law (MLRL)	$2.9	n/a	**$2.9**
Motor Fuel Tax			
High Estimate	$14.8	n/a	**$14.8**
Low Estimate	$13.1	n/a	**$13.1**
Total Fiscal Impact			
High Estimate	$74.7	$26.4	**$101.1**
Low Estimate	$68.9	$18.5	**$87.4**

* Depending on the residency of the direct and spillover employees, there may be additional local income taxes generated (e.g. NYC personal income tax).
†When considering the entire MCMI industry (not just mining), the corporate tax generated is obviously much larger than that reported in the fiscal impact table.

Based on CGR estimates, in 2007 the public sector in NYS gained between $87 million and $100 million as a result of the MCMI.

Impact of Closing Mines on Transportation Costs & Cost of Construction

Mining operations within the mining industry are often forced to defend their existence. Many voters would prefer not to have a mine in their community. To illustrate the cost implications of not having operational mines in the vicinity of construction projects, thereby increasing the distance from mines to construction sites, CGR analyzed the impact that removing a percentage of mines would have on the transportation costs of aggregate.

CGR considered the 496 miles of the NYS Thruway mainline in constructing this hypothetical scenario. Given the sporadic nature of construction, CGR used the average metric tons of aggregate utilized by the NYS Thruway over the last three years to calculate the cost of transporting aggregate from the mine to the highway construction site.* CGR calculated the mileage from each mainline Thruway exit to the nearest of the76 limestone, dolostone, and traprock mines (commodities most heavily used in construction) across New York State. Given the rising cost of fuel over the last year, CGR computed the cost of transporting the metric tons of aggregate for various fuel costs and found that:†

- Randomly removing one-quarter of the mines increased transportation costs by 42%, regardless of the price per gallon of fuel, by increasing the distance from an exit on the NYS Thruway to the nearest mine. If the price of fuel were to rise again to $4 per gallon, the cost of transporting the average amount of aggregate used by the NYS Thruway each year would increase by $1.6 million if one-quarter of the mines were randomly taken away, and by $2.2 million if the number of mines were reduced by one-half. This means that if any random one-half of the mines were no longer in operation, transportation costs for construction projects would increase by 59%—ultimately affecting NYS taxpayers.

* The average annual tonnage of aggregate used by the NYS Thruway is 768,800 metric tons.

† See the methodology section for details on the assumptions made for this illustration.

Annual Cost Implications of Increasing Transportation Distance				
	Cost of Fuel per Gallon	All mines included	One-quarter mines taken away	One-half mines taken away
Average Distance from Exit to Nearest Mine (miles)	----	13.5	19.1	21.4
Cost of Transporting Aggregate for Thruway Projects (millions of dollars)	$2	$3.4	$4.8	$5.3
Cost of Transporting Aggregate for Thruway Projects (millions of dollars)	$3	$3.6	$5.1	$5.7
Cost of Transporting Aggregate for Thruway Projects (millions of dollars)	$4	$3.9	$5.5	$6.1
Percentage Change in Cost (from all mines included)			42%	59%

METHODOLOGY

There is no one data source that gives an accurate picture of the mining and construction materials industry. The New York State Department of Labor provides data on wages and employment for mining, but this does not include the construction materials side of the MCMI. Furthermore, the DEC provides data on the number of active mines, and the number of affected acreage for these mines. However, not all permitted acreage is actively being mined. For these reasons, CGR determined it was necessary to first estimate the acreage being actively mined and then to collect primary data from mine operators via the survey. Details on the methodology used for both aspects, as well as for calculating the economic and fiscal impact, are included in this section.

Creating the Data Set

The DEC provides data on the number of permitted mines, with about 64,000 acres affected statewide. Not all the affected acreage is actively being mined. To estimate the number of acres currently being mined, CGR consulted with DEC's Division of Mineral Resources, including Director Bradley Field and Christopher McKelvey of the Bureau of Resource Management and Development, Resource Development Section and reviewed the data provided by their offices. CGR also consulted with industry experts, including NY Construction Materials Association Executive Director Dave Hamling, NY State geologist William Kelly and consulting geologist Paul Griggs. In addition, CGR used the data collected from survey respondents. To be conservative in our estimate of the economic impact of the mining industry, CGR determined that it would use a range of affected acres of 55,000 to 62,000. As 83% of affected

acres among survey respondents were used for mining, CGR applied the same proportion to all mines included in the study. Thus, the operational acreage for the study analysis ranged from 46,000 to 52,000 acres.

Survey of Mine Operators

With support from the New York State Geological Survey / New York State Museum and the New York Construction Materials Association, CGR distributed 204 surveys to companies in the MCMI. Potential respondents were given the option of returning the survey via mail, fax, or e-mail, or completing an online version. The 204 companies were chosen to fairly represent the different types of minerals as well as both the small and large players in the industry. In addition, all companies attending the NY Construction Materials Association meeting in May 2008 were offered an opportunity to participate.

As seen below, survey respondents represented at least half of the industry. With such a firm foundation of actual responses, we make our extrapolations to the entire industry with confidence.

CGR received 103 responses, 12 of which were designated not applicable based on the respondent's self-reported status such as "out of business" or "sold out." Thus, the data CGR reported from the survey encompasses the 91 companies who completed the survey.

The survey specifically asked how many mines permitted by the DEC each respondent had. The 91 firms from the survey represent 191 operational mines with sales of about $780 million. As CGR estimates total mining sales as between $1.4 billion and $1.6 billion, the survey captured about half of the industry.

The commodities produced by the 191 operational mines accounted for in the survey are presented below.

Commodities Produced by Survey Respondents (Operational Mines only)				
Commodity	Number of Mines	Percent of All Operational Mines	Total Acreage	Percent of All Operational Acres
Bluestone	5	12%	44	13%
Dolostone	16	84%	1,903	85%
Garnet	1	100%	107	100%
Granite	7	47%	542	71%
Limestone	38	66%	6,877	77%
Salt	2	67%	9,932	99%
Sand and Gravel	104	15%	6,742	32%
Sandstone	7	15%	783	81%
Topsoil	2	22%	37	12%
Shale	4	29%	260	45%
Trap Rock	1	100%	153	100%
Wollastonite	3	100%	261	100%
Zinc	1	100%	432	100%
Total	191		28,073	

In all cases but topsoil, the percentage of operational acres represented by survey respondents is equal to or larger than the percentage of operational mines. This suggests that the mines in the survey represent, on average, the larger acreage mines of the commodities represented. Four commodities (clay, glacial till, marble and peat) are produced by operational mines but were not represented by the survey respondents.

Payroll Estimates

In order to estimate the payroll of the MCMI, CGR used employment and payroll information from the survey data to estimate wages and employment for the remaining mines for which we had no direct data beyond that included in the DEC's database of permitted mines.

Characteristics of Survey Respondents	
Number of Firms	91
Full Time Employees	6,419
Part Time & Seasonal Employees	460
2007 Payroll ($million)	$310.4

Since we did not ask survey respondents to attempt to estimate payroll and employment for each product—and many mines produce more than one—we did not have sufficient detail to estimate employment and payroll information by product. We did, however, separately estimate payroll and employment for mining operations on the one hand, and HMA/RMC/Portland Cement on the other.

Potential Total Sales Estimates

In order to estimate the potential total sales of the mining component of the MCMI, CGR used sales and production information from the survey to estimate sales per operational acre.

To estimate the potential total sales of the HMA component of the MCMI, CGR used sales and production information from the survey to estimate sales per ton of HMA produced. CGR then combined survey responses, the sales per ton estimate, and information from the Asphalt Institute on the total amount of HMA produced in New York State in 2006* to estimate the potential total sales of the HMA component of the MCMI.

Similarly, CGR estimated the potential total sales of the RMC component of the MCMI by using sales and production information from the survey to estimate sales per cubic yard of RMC produced. CGR then combined survey responses, the sales per cubic yard estimate, and information from the National Ready Mixed Concrete Association on the total amount of RMC produced in 2007 to estimate the potential total sales of the RMC component of the MCMI.

Using information provided by survey respondents producing HMA and RMC on payroll and employment, CGR estimated direct payroll and employment for nonrespondent firms.

Total Sales of Mining & Construction Materials Industry (millions of dollars)	
Mining	
High Estimate	$1,630
Low Estimate	$1,441
Hot Mixed Asphalt	$704
Ready Mix Concrete	$940
Cement	$254
TOTAL	
High Estimate	$3,528
Low Estimate	$3,339

Estimating the Economic Impact

CGR used IMPLAN, a regional input-output modeling system, for estimating the economic impact. IMPLAN is widely acknowledged as one of the best models of economic activity available. The IMPLAN database, created by MIG, Inc., consists of two major parts: 1) a national-level

* Latest data available.

technology matrix, and 2) estimates of sectorial activity for final demand, final payments, industry output and employment for each county in the U.S., along with state and national totals. Data are updated annually. IMPLAN estimates the direct and spillover (indirect and induced) impacts of economic change through the use of multipliers, and estimates the impact of an increase in demand in a particular sector on 511 different industries/sectors of the local economy.

Estimating the Impact of Reducing the Number of Mines

In order to calculate the additional cost of removing mines from proximity to the construction sites, CGR first mapped the 76 operational limestone, dolostone, and trap rock mines throughout NYS.* Using DEC data on the mines' latitude and longitude along with cartographic tools, we calculated the average distance from each of the 75 exits on the NYS Thruway to the nearest operational mine that produced one of these three commodities.

To calculate the absolute cost, CGR used the following assumptions:

Assumptions for Transportation Cost Analysis	
Labor cost per hour	$20
Overhead per hour (depreciation/maintenance of truck, etc)	$40
Cost per gallon of fuel	$2-$4
Number of miles driven in a day	240
Miles per gallon	4.5
Number of tons hauled in one load	20
Number of metric tons hauled in one load	18

The assumptions above equate to assuming $76 per hour per truck when gas costs $3 per gallon, $81 per hour per truck when gas costs $4 per gallon, and $87 per hour per truck when gas costs $5 per gallon. This includes all costs, including labor, depreciation, insurance, overhead and fuel.

CGR obtained information on the metric tons of aggregate used on the NYS Thruway for 2005, 2006 and 2007 from the New York State Thruway Authority to calculate the absolute costs of transporting aggregate. While the absolute costs are dependent on the previously explained assumptions, the percentage change in costs is in direct relationship to the percentage change in the average miles from the mine to the construction site. To that extent, this illustration can be extended to any type of construction project using aggregate. If the closest mine to a given construction site does not receive a permit and the distance to the

* These commodities are commonly used in construction projects.

nearest relevant mine increases by 50%, one can expect the costs of transporting the aggregate to increase by 50%.

These conclusions are applicable to the entire industry. Transportation costs are a significant share of the total cost of aggregates. Continued shrinkage of the industry will drive up the cost of new construction and highway reconstruction. Our data did not permit a more detailed analysis by region, but clearly the impact would be more pronounced downstate.

CONCLUSION

This analysis makes a powerful statement about the significant contributions that the Mining & Construction Materials Industry makes to the New York State economy. **This important industry pays $1.2 to $1.3 billion in wages to 28,000 to 30,000 workers. Total sales for the industry are $3.3 to $3.6 billion. In addition the industry provides possibly $100 million in payments to the public sector.**

Moreover, the cost of the products of the MCMI industry affects expenses for the entire construction sector, particularly the construction and maintenance of the state's critical road network. State and local government alike should recognize this industry's importance and take steps to preserve its viability.